MARKETING CONSTRAINTS FACED BY COMMUNAL FARMERS IN KWAZULU-NATAL, SOUTH AFRICA: A CASE STUDY OF TRANSACTION COSTS

By

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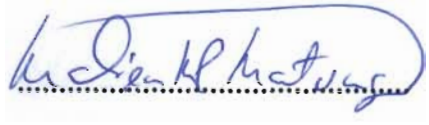

Maliem Pierre Matungul

A Mamie Ursule et Jesse Tavun, je dédie ce travail.

ABSTRACT

Farmers engaged in small-scale agriculture in Africa generally have limited access to factors of production, credit and information. Empirical studies throughout the African continent have shown the extent to which high transaction costs constrain or prevent access to information and markets, especially for small-scale farmers. Despite these constraints, farmers in two communal areas of KwaZulu-Natal (Impendle and Swayimana) have managed to produce food for both own consumption and marketing. This study draws heavily on the New Institutional Economics, and particularly Transaction Cost Economics, which have demonstrated the important role of transaction costs in constraining economic activity, and of institutions developed to lower these costs. Transaction costs are the costs of exchange, including costs of information, negotiation, monitoring, coordination and enforcement of contracts. These costs can be implicit or explicit.

The main objective of the study is to assess marketing constraints faced by communal farmers in the Impendle and Swayimana regions of KwaZulu-Natal, South Africa. Data were drawn from random sample of 120 household heads in each of the regions. In Swayimana, data were collected in January and February 1999 whereas the survey in Impendle was undertaken in April and May 1999. The empirical analysis attempts to identify factors determining the quality and number of marketing channels used (i.e. depth in marketing methods), which in turn affect the level of income generated from crop sales by small-scale farmers in the two study areas. The identification of such factors might support initiatives to create a more viable small-scale farming sector in the communal areas of KwaZulu-Natal. A block-recursive model was formulated and estimated using ordinary least squares

(OLS) and two-stage least squares (**2SLS**). Empirical analysis of the OLS equation suggested that transaction cost variables are important in explaining the choice of, and depth in, marketing methods.

Results of the combined samples indicate that cooperation with neighbouring commercial farmers, and the interaction of distance and ownership of a vehicle were the most important factors in the choice of marketing methods. Other factors such as the age of household head, having a formal bank account and the area of allocated arable land, also significantly and positively influenced the depth of marketing methods. At a regional level, the same equation revealed that while COOP was the most important factor in Swayimana, DISTRA and ACC were the main determinants in Impendle. The 2SLS regression analysis indicated that greater depth in marketing methods, which reflects lower transaction costs faced by growers, has a strong and positive impact on the level of crop income generated; i.e. the lower the transaction costs faced, the greater is the depth in marketing methods, and the higher the level of crop income. The results imply that formal marketing channels are associated with low transaction costs and higher levels of crop income. The area of cultivated arable land and income from non-agricultural activities were the other two important determinants of crop income.

It is concluded that accessibility to formal market outlets is limited by considerable farm-to-market distance, poor infrastructure (roads, telecommunications), and inadequate transportation. Recommendations give due consideration to the development of a better physical and institutional infrastructure which would effectively link these production areas to market centres and improve market knowledge by providing relevant market information and farming skills.

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INTRODUCTION

Of a population of approximately 8,5 million people in the province of KwaZulu-Natal, South Africa, 5,3 million (62%) live in rural areas - most of whom (75%) reside in the communal areas of the former KwaZulu homeland (Marcus *et al.* 1995).With a mean monthly household income of R788 and a mean monthly per capita income of R126 in 1992, May (1995) concluded that over half the population (52%) in the province lives in poverty. While there is potential for small-scale farming there is also a great challenge for all institutions committed to improving the standard of living of rural people. The communal areas of KwaZulu-Natal account for 31 per cent (2,84 million hectares) of the province's land while commercial farms account for 4,13 million hectares, or some 45 per cent of the land (KFC, 1995:48-51). The former is dominated by subsistence agriculture characterised by low output and poor yields. For example, maize yields of small farmers in Region E, which comprises the province of KwaZulu-Natal and part of the former Transkei homeland, range from 0.4 ton/ha in areas of low potential to 1.2 ton/ha in dryland areas of high potential. The average maize yield in the commercial farming areas of KwaZulu-Natal is 3.12 tons/ha (Smit and Brown,1993).

The former KwaZulu homeland (hereafter referred to as KwaZulu the communal areas of KwaZulu-Natal) has seen a rapid acceleration of semi-commercial agriculture since the mid 1980's (Smit and Brown, 1993). Cultivation has become an important support strategy for more than half of the population, despite production and marketing constraints. Surveys in this region have suggested that income generated from subsistence or semi-commercial farmers amounts to no more than 10% of household income (Smit and Brown,1993). Major contributors to household income in the communal areas are formal wages, followed by wage remittances, entrepreneurial

activities and welfare or pension transfers (Marcus *et al.* 1995).

Small-scale agriculture in South Africa cannot be ignored as it has the potential to become a major source of employment and political stability (Delgado,1999). Farmers engaged in small-scale agriculture have limited access to factors of production, credit and information. Markets are often constrained by inadequate property rights and high transaction costs (Lyne,1996). Despite these barriers, many communal farmers in KwaZulu-Natal manage to produce food for both own consumption and marketing. Their produce is sold through formal and informal channels.

The causes of low productivity and poor performance in the small-scale sector have been researched and debated. Several empirical studies have dealt with the constraints faced by small-scale farmers in the former homelands of South Africa. Some of these studies have examined only a limited range of questions relating to land tenure, delivery of services or access to credit (Barnes and Morris,1997; Jones *et al.*,1996; Thomson,1996; Kuhn *et al.*, 2000; Fenwick and Lyne, 1999). These studies consider the lack of assets, market information and education, as well as poor physical and institutional infrastructure to be the most important barriers to market participation. They recognise that better access to production services (i.e. extension, inputs, credit and product markets) by small-scale farmers is pivotal to increasing market participation by communal farmers, and should constitute the backbone of any agricultural development initiative. Empirical studies throughout the African continent have shown the extent to which high transaction costs (i.e. costs of doing business) constrain or prevent access to information and markets, especially for small-scale farmers (Delgado, 1999; Goetz,1992; Makhura,2001). This research builds on these studies and attempts to assess the direct impact of transaction costs on the choice of marketing channels and crop income.

If increasing farm incomes for small-scale farmers is an important policy objective, then problems related to marketing of agricultural products have to be of paramount concern. Large multiplier effects in the rural non-farm sector mean that agriculture can make a substantial contribution to the rural economy provided surpluses are sold, that is, provided cash incomes increase for the majority of households (Ngqangweni, 2000, cited by Makhura,2001).

A particular feature of this study is that it focuses on socio-economic characteristics and resource endowments of small-scale farmers when explaining their ability to generate income from the sale of food crops. It examines various challenges and constraints faced by these farmers that hinder their quest for higher productivity and farm incomes. Furthermore, the empirical analysis provides pragmatic policy recommendations to enhance market participation amongst small-scale farmers, converting them from subsistence to commercial farmers, and thus stimulating the rural economy through higher crop incomes.

The thrust of the study, however, centres on marketing constraints faced by communal, small-scale farmers in the Impendle and Swayimana regions of KwaZulu-Natal, and on ways of alleviating these constraints. The study relies on theory drawn from Transaction Cost Economics (TCE). It constructs an index representing the transaction costs that influence marketing methods and the level of crop income. Furthermore, the study considers arguments supporting the idea of promoting efficient institutions to reduce transaction costs and assesses ways in which such institutions can be influenced by the social, cultural and political-economic environments.

The New Institutional Economics (NIE), concentrates on transaction costs and the institutions developed to lower these costs (Coase, 1960; Williamson, 1985, 1987; North, 1981, 1997; Dorward

et al., 1998). Smallholders in Africa often face high transaction costs in production and marketing of agricultural outputs due to the nature of their products and the institutional environment in which they have to operate (Delgado, 1999; Lyne, 1996). North (1990) defines transaction costs as the costs involved in exchange or trade (e.g. marketing costs), costs of intangibles (such as search for exchange partners), contract monitoring and enforcement. Moreover, transport, handling, packaging and storage costs should be included with transaction costs in Sub-Saharan African countries (Delgado, 1997). Generally, transaction costs can be explicit and/or implicit. Explicit transaction costs include transport costs, for example bus fares, while implicit transaction costs include the opportunity cost of time spent searching for new partners/customers, gathering market information, traveling and waiting time. The implicit costs are usually higher, suggesting that proximity to institutions such as markets and banking facilities is crucial. The size of these costs depend on the degree of market organization and the development of the physical and institutional infrastructure (Gonzalez-Vega, 1993). Transaction costs vary by product, type of agent in the marketing chain and farmers or rural households with different asset bases. The terms on which transactions take place are complex and diverse, and may be strongly structured by ideological and social factors such as gender, class and caste. High transaction costs mean that it is not worthwhile for many rural household to participate in critical markets (especially for credit, food, insurance, and labour), even if these markets exist (Harris *et al* 1995).

Institutions are the formal laws and informal conventions that influence transaction costs and shape the benefits offered by trade and exchange (North, 1990). According to North (1997), the three landmarks in the historical reduction of transaction costs were the institutions (economic and political) that made possible impersonal exchange, the protection and enforcement of property rights by the state, and the green revolution research in agriculture. Broadly speaking,

the economic institutions have been those that permitted the growth of markets (e.g. rules of exchange) or improvements in, or the introduction of, new technology (e.g. telecommunications). The political institutions have been those that improved the security of property rights and the enforcement of contracts. The historical decline in transaction costs has been reflected by both own accord and coercive solutions to problems of exchange (North, 1997).

Achieving rural economic growth will require the participation of small-scale farmers in various markets (land, credit, input, product and contractor services). Government policies, education, market information and access to capital are important factors in market participation by small-scale farmers in Third World countries (Delgado, 1997). Thus, policies affecting rural marketing institutions, property rights and both physical and legal infrastructure which deal effectively with transaction cost obstacles within the communal areas of KwaZulu-Natal are needed.

Under structural adjustment policies initiated by the World Bank during the early 1980's, privatizing or liberalizing agricultural marketing - together with appropriate macroeconomic and trade policy reforms - was widely expected to increase producer profits and bring forth a strong production response, contributing towards agricultural development, social upliftment and the reduction of rural poverty (World Bank, 1994). This neo-classical approach, however, overlooked the institutional environment under which small-scale farmers operate. Disappointing outcomes throughout the continent have prompted renewed research attention to agricultural markets in developing countries (Jones, 1996). This study hypothesizes that growth in small-scale agriculture is limited by high transaction costs in both production and marketing of products by emerging small-scale farmers. Understanding the nature of these constraints and how they can be alleviated is central to using small-scale agricultural development as a tool to improve rural livelihoods

(Delgado, 1996). In African economies that are only partly commercialized, as is the case with most former homelands in South Africa, small-scale farmers are likely to face higher transaction costs per unit of production than larger producers because many transaction costs (especially information costs) are fixed costs. These fixed costs are exacerbated by poor access to market information and technology (needed to enter into new activities), inadequate transportation and telecommunication services, and bad roads.

Poor market knowledge and structural imperfections (Delgado,1999) as well as small farm sizes (Nieuwoudt,1990) have often been asserted to be the cause of low productivity and income in the small-scale farming sector of South Africa (causing sector stagnation), but the role of transaction costs and institutions designed to reduce them are not well understood. Transaction cost-related studies have been emerging in recent years throughout South Africa (Fitschen and Klitgaardt,1996; Thomson,1996; Fenwick,1998; Makhura,2001; Crookes ,2001 and Matungul *et al.* 2001). However, there has been no empirical study that analyses the implicit relationship between transaction cost factors and the income generated from the sale of food crops by small-scale farmers in the communal areas of KwaZulu-Natal. Even less is known about the impact of informal institutions that influence the transaction costs facing these farmers.

Objectives of Study

The overall aim of this research is to identify marketing constraints faced by small-scale farmers in KwaZulu-Natal, and to help in the design and implementation of policies that are directed towards promoting sustainable small-scale farming in the communal areas of South Africa, in the context of agricultural policy reform and trade liberalization. The study tests the hypothesis that

small-scale farmer participation in product markets and revenue from crop sales are adversely affected by high transaction costs. The empirical objective is to determine the impact of transaction cost proxies on the marketing methods used by small-scale farmers in two communal regions of KwaZulu-Natal, namely Impendle and Swayimana, which, in turn, determines their level of crop income. The extent to which household characteristics and transaction cost variables influence marketing methods is assessed in terms of the farmer's ability to discover market outlets, new partners and marketing information at lower costs. Related objectives include identifying the nature of transaction costs and determining their impact on the ability of small-scale farmers to market agricultural products. To contextualise the study it is necessary to identify major factors influencing the marketing system within the study areas, to examine obstacles preventing the integration of emerging farmers into existing marketing channels, and to consider the role of extension services and other administrative support in reducing transaction costs. Specifically, this study aims to achieve the following:

1) Determine the current marketing situation in Impendle and Swayimana in terms of the following criteria:

- marketing channels (formal and informal) currently utilised for the sale of food crops
- how much of each product was sold and where it was sold
- pricing practices
- distance to main markets and banking facilities
- roads and telecommunication infrastructure
- the specific needs of small farmers concerning marketing activities and the availability of market outlets.

2) Investigate socio-economic variables detrimental to the low level of crop production in particular, and farming in general.

3) Evaluate the contribution or lack of contribution of extension officers in terms of their knowledge of agricultural marketing and of the prevailing situation within their area of responsibility.

4) Draw conclusions and make suggestions regarding the improvement of the production and marketing system to better meet the needs of small-scale farmers in the communal areas of Impendle and Swayimana.

To achieve the above-mentioned objectives, a sample survey will be conducted in the two study areas. Empirical methodologies, including principal component analysis (PCA) and a two-stage least squares model, will be used to identify the main determinants of transaction costs.

The New Institutional Economics (NIE) and its relevance to development is introduced in the first chapter, followed by an introduction to Transaction Cost Economics (TCE) in chapter 2. Research sites and data collection procedures are presented in chapter 3. The questionnaire used for the survey is also explained in this chapter. In chapter 4 descriptive statistics of the socio-economic characteristics of the sample population are presented, as well as factors influencing marketing activities in the study areas. Chapter 5 deals with the empirical analysis of marketing methods and crop income. Factors influencing marketing methods and crop income are discussed, and a block-recursive model developed and estimated using OLS regression (to identify factors influencing marketing methods) and 2SLS regression to identify factors influencing crop income. Conclusions and recommendations for policy initiatives and further research are presented in chapter 6, and the study findings are summarised in chapter 7.

CHAPTER 1

INSTITUTIONS AND ECONOMIC DEVELOPMENT

Conceptual theories which underlie arguments both for and against the role of governments and local institutions in resource allocation and management are discussed in this chapter, along with the possibility of developing a more sustainable approach which takes account of existing physical and institutional arrangements. This chapter draws heavily on the New Institutional Economics theory with reference to communal small-scale farmers in the study areas. It should be noted that despite the poor physical and institutional infrastructure in these rural areas, many changes or innovations have occurred or are under way since the survey took place in 1999. These include, for example, the electrification of certain areas, and improvements to graveled roads within the survey regions. Moreover, the municipal elections in 2000 brought about a new configuration and dispensation for districts throughout the country. Also, under the new dispensation, if implemented, the tribal authority is expected to be assigned to deal only with tribal matters.

1.1 NEW INSTITUTIONAL ECONOMICS (NIE): CONCEPT AND THEORIES

The New Institutional Economics (NIE) theory, which has provided a number of insights into the behaviour of modern households in developed countries (Dietrich, 1994; Dugger, 1993; Williamson,1999; Coase, 2000), can certainly enable the behaviour of subsistence farm-households in Africa and their response to development initiatives to be seen in a new perspective. This new perspective has particular relevance at a time when sustainable small-scale commercial agriculture has taken centre stage within the policy of empowerment and betterment of rural

households conditions throughout South Africa (Jones *et al.*,1993). State regulations, ill-defined property rights and other constraints do not stimulate economic activity, but discourage it. "Some organisations that operate within developing countries' institutional frameworks are not inefficient, they are efficient at making a society more unproductive"(North 1990:9). This study borrows from the New Institutional Economics, particularly Transaction Cost Economics (TCE), in order to understand marketing problems faced by emerging small-scale farmers in South Africa. In so doing, the study should provide an explanation of the generally poor performance of agricultural projects in rural areas and an understanding of why development strategies and technologies succeed in one region and fail in another.

According to Low (1986:2), the underdevelopment of the indigenous sectors in southern Africa stresses either historical neglect and policy discrimination or institutional bias that favoured large-scale modern, urban and capital-intensive production over small-scale peasant farming. To correct these inequalities, many efforts were made through various schemes (e.g. rural infrastructure, marketing boards, credit facilities, extension, etc.). However, despite all the efforts, the results have been below expectations in most developing countries (Low,1986).

This observation, therefore, calls for a different way of looking at small-scale agricultural development in the Third World countries. The importance given to the interaction between institutions and organisations makes the NIE approach especially relevant for long-run Third World development (Harris *et al.*,1995). Its recognition of the cultural-institutional change and the prospect of positive institutional change as a result of individual actions, can be used to analyse development projects throughout the Third World. The NIE can be used in assessing market formation (or failure), in particular the creation of a framework for individual

maximisation, the role of the state in setting and policing the rules of the game and the influence of interest groups or organisations in shaping institutions in the Third World (Harris *et al.*, 1995). Nabli and Nugent (1989) argue that in mainstream neo-classical economics, four main types of constraints have received considerable attention: individual preferences, technological opportunities, physical and human capital endowments and market opportunities. In such analyses, the institutional framework has almost always been taken as given, and in many cases has even been altogether forgotten. The explicit or implicit assumption of given institutions, they believe, is especially unrealistic and limiting in the context of economic development. The goal of the NIE is to overcome these important limitations of mainstream neo-classical economics (Nabli and Nugent, 1989).

To Nabli and Nugent (1989) NIE represents the intersection of a number of different lines of investigation, including among others, the analysis of behavioural norms, the integration of persons with different tastes and preferences into voting coalitions, interest group formation, the problems of and prerequisites for (successful) collective action, transaction costs, organisation theory, limitations on the rationality of human behaviour, the determinants of firm structure, coordination problems, rent-seeking behaviour, technological change and its relationship to institutional change, and the determinants and effects of property rights. Many of these lines of investigation within the NIE are interdisciplinary.

Bates (1989) also thinks that the NIE offers ways of understanding the economic significance of features of Third World societies and cultures that market-based reasoning might misunderstand or ignore (e.g. different forms of contracts). The NIE does not exclude alternative options, and the proper role of this theory might be to provide diagnoses rather than to prescribe cures, where

non-market institutions and market failure are of particular importance. Furthermore, institutional change can be considered to be the focus of the long run process of economic development, providing the missing link between development and growth (Nabli and Nugent,1989). Nabli and Nugent (1989) argue that it might be appropriate to define economic development as economic growth accompanied by "efficient" institutional change. There exist many interrelationships between institutions and economic growth. First, economic growth can, and most of the time does, stimulate changes in institutions and, secondly, institutions can profoundly influence the level and rate of economic growth (Nabli and Nugent,1989). By affecting transaction costs, institutions can have the effect of either facilitating or retarding economic growth. Appropriate political institutions, rules and policies will stimulate economic growth. Institutions also affect growth through their effects on expectations, social norms and preferences.

With respect to the effect of economic growth on institutions, economic growth may provoke changes in contractual choices, the importance of markets, the extent of private property rights, the relative importance of different constraints and in technological choices. Economic growth can make some existing institutions obsolete and lead to the creation of new ones. However, the opposing view considers that institutions may not always evolve "efficiently" (Nabli and Nugent,1989). Institutional inflexibilities sometimes prevent adaptations to the various environmental changes and make existing institutions inefficient. Nabli and Nugent (1989) point out that some institutional alternatives may be eliminated from the feasible set by historical precedent. The influence exerted by existing institutions may be one of the main forces impacting on the institutional choices. Also, institutions which benefit just a few may be kept if each member of the particular society fears being punished or excluded for not adhering to the institutional rules. Institutional change may be prevented by high cost of collective action and by political

resistance (Lyne *et al.*,1997:64). The application of NIE to development policy could lead to significant new policy initiatives in less developed countries in general, and in less developed regions of South Africa in particular.

1.2 INSTITUTIONAL SETTINGS AND EVOLUTION

The importance or relevance of institutions and the incentives derived from them to promote economic efficiency have been widely considered since the successful experience of China with decollectivisation of agriculture in the early 1980s (Lin & Nugent, 1995). According to North (1997), the key to the expansion of trade and an era of substantial economic growth between the eleventh and fourteenth centuries in Europe was the development of a set of institutions that allowed anonymous exchange to take place across space and time. Inter-community credit markets, insurance markets, contracts for future delivery, and the bill of exchange were all institutional features of this commercial revolution. Broadly speaking, the economic institutions have been those that allowed the growth of markets or improvements in, or the introduction of, new technologies. The political institutions are those that improve the security of property rights (North, 1997). Nowadays, new legal arrangements and new marketing techniques have emerged, and are continually emerging, to reduce transaction costs. Institutional reform should be able to reconcile both formal and informal institutions.

There are other pertinent local and international examples highlighting the difficulties, success and progress associated with institutional transformation. Graham and Lyne (2000), for example, outline the progress of land redistribution in KwaZulu-Natal. Barkan and Chege (1989) highlight the difficulties of institutional transformation in Kenya in their analysis of that country's attempts

to decentralise the state as a mechanism for initiating rural development. They show that attempts at state decentralisation will not impact significantly on established institutional relationships unless there is a fundamental reallocation of state funds to newly created tiers of government, something which, they contend, did not occur in Kenya. Cousins and Robins (1993) point to the various institutional problems in their study of Zimbabwe's land redistribution and management experience. They demonstrate that the "top-down" approach by the state to institutional development in land redistribution is a major factor limiting the success of the programme in Zimbabwe. They show how, as in the case of Kenya, an important development initiative was undermined by a static institutional environment that was unable to adapt to changing development needs.

Institutions are created in response to problems of organization of information, of transactions and of property rights, under condition of environmental and biological differences and uncertainty, and bounded rationality (because of informational uncertainty and the distribution of cognitive competence). Under circumstances of specialization or lack of it in production and marketing, as well as underdevelopment of information infrastructure, information may be costly to obtain, control or transfer (Lin and Nugent, 1995). Information and monitoring and enforcement costs are components of a broader set of costs necessary to the making and protection of contracts, and are known as transaction costs. These include the costs of search and screening, of negotiating and transfer of property rights, of co-ordination, and of safeguarding contracts. Institutions (i.e. formal or informal rules) are efficient responses to transaction costs. Transaction costs increase with distance, market concentration, systemic complexity and declining clarity of property rights, and decrease with relational contracts, with the standardization of

measurement technologies for quantity and quality, and when investments are flexible and not specific (Marion,1986, cited by Harriss-White, 1999).

The NIE suggests that the policy framework dealing with development in general, and particularly with rural development issues, must recognize that institutional factors are important determinants of the development process. Development cannot be looked at without considering the institutional environment in which it is to take place, and that development is highly dependent upon the establishment of a sound development-oriented and structured institutional environment capable of delivery (North,1997; Ensminger,1992). Depending on whether reference is made to institutions or organisations, institutions (formal and informal) are patterns of behaviour embedded in social relations and recognized and valued by society (North,1981), while organisations are purposeful, structured and role-bound social units (Fowler,1992:14). In sum, institutions are systems of enforceable and legitimate rules, while organisations are actual systems of cooperation where people get together in order to carry out a designated function (North, 1990). The two definitions are frequently vague because they both shape and direct social behaviour, and institutionalised social behaviour is to a large extent expressed by work and interaction between people in organisations. As a result, the institutional approach contends that although organisations are an important element of the overall institutional environment, it is the institutional environment itself that determines organisational activity, and not the other way round. The policy implication of this view is that the institutional environment itself should be at the centre of any development analysis.

1.3 ECONOMIC GROWTH AND EFFICIENT INSTITUTIONS

Institutional environments are important determinants of societal activity. People's actions and their ability to perform tasks are largely determined by the institutional environment in which they find themselves (Barnes and Morris,1997; North,1990). Unless the appropriate service delivery organisations are in the right place at the right time, and operate within a stable development-oriented institutional environment, the delivery will not take place (Barnes and Morris,1997).

The absence or underdevelopment of various markets, such as those for finance (credit), insurance and future transactions of commodities, skilled workers and managers, is itself a subject of interest that may be analyzed in institutional terms. By being party to contracts and being able to set rules and constraints, governments in less-developed countries can change the nature and role of transaction and information costs, either reducing their importance or magnifying them and thereby creating additional sources of opportunistic behaviour. Numerous interrelationships between institutions and economic growth can be identified. On the one hand, economic growth can and frequently does trigger changes in institutions and, on the other hand, institutions can profoundly influence the level and rate of economic growth. By affecting transaction costs and coordination possibilities, institutions can have the effect of either facilitating or retarding economic growth (Lin and Nugent, 1995).

Appropriate political institutions, rules and policies enhance economic growth. Social norms also play an important role in affecting the extent to which growth-enhancing activities can take place. For example, religious norms may either encourage or inhibit money and entrepreneurial activities. The key in a market economy is private property and individual freedom. Property rights regime

heavily influence agroindustrialization in developing countries (Escobal *et al.* 2000). Mises (1949), cited by Ebeling (1990), explained that the institution of private property made all this possible. Ownership and voluntary exchange create opportunities for gains from trade. Competitive bids and offers for various goods (i.e. land, water) and services (i.e. transport, tractors) generate market prices at which transactions are consummated. These prices would convey useful information to everyone in the market about what products are in demand in the rest of the region or world.

Private ownership of the means of production permits the acquisition and hire of resources (e.g. arable land) and labour for the production of goods that consumers may desire to purchase. By not allowing private ownership of the means of production eliminates peaceful, voluntary exchange (Ebeling, 1990).

1.4 STATE VERSUS PRIVATE SECTOR

1.4.1 The role of the state in reducing transaction costs

Several implications for the role of the state in the economy flow from transaction cost economics. Yet, these implications have been largely ignored in the rapidly growing transaction costs literature (Dugger,1993). Dugger (1993) addresses the gap in terms of four questions: a) What is the role of the state in the institutionalisation of exchange transactions? b) What is the role of the state in settling disputes that arise from exchange transactions? c) In the provision of public goods (roads, telecommunication, etc.), should the state make or buy them? d) What kind of state should be chosen to rely on for institutionalising exchange transactions, settling disputes and

providing public goods? The state plays a determining role in the institutionalisation of exchange transactions. The state's definitions and protection of property rights are essential to exchange. Furthermore, he adds, the state helps to establish, interpret and enforce a whole series of rules and procedures governing specific exchange processes.

Institutions that have the effects of decreasing transaction costs not only make trade more profitable, but may also increase competition in different sectors of trade, thus allowing those with less capital to break into one stage of the marketing process (Ensminger, 1992). Examples of such institutions are:

- The simple notarizing of legitimate traders and property rights by third-party agencies,
- Security forces that reduce crime,
- Banking facilities that extend credit and reduce the danger of travel with cash,
- The regulation of weights and measures,
- Courts that enforce contracts and property rights,
- Telecommunication and roads (which increase the flow of information and traffic). Ensminger (1992) believes that a clear presence of these institutions will certainly lead to a greater involvement in all aspects of agricultural marketing by the targeted population.

Also, North (1981) thinks that the state can realize economies of scale in the provision and regulation of institutions such as those described earlier, further reducing transaction costs. As more economically efficient state institutions reach further into peripheral areas, the costs of transactions decline and are shifted from local traders and producers to the state. Consequently, the relative profitability of trade increases, and more actors are pulled into exchange. With increasing commercialization, Ensminger (1992) concludes that new economic opportunities for

the poor and middle households may bring positive changes such as increasing real income and consumption, more favourable terms of trade, better education and health care, improvement in nutritional status, lower interest rates and less discriminatory policy against poor households. Many of these, he adds, can be related to government policies such as structural adjustment, policies that reduce transaction costs and therefore increase profits to traders and/or producers, and a more effective central government.

Marketing proceeds more smoothly and cheaply when the local government is able to protect those involved against violence, theft and extortion. The use of weights, measures and quality descriptions understood by market participants reduces the area of disagreement and allowances that must be made for risk of fraud. Public provision for the enforcement of contracts and penalties for non-completion is a basic requirement (Abbott, 1987). Abbott (1987) argues that the provision of public goods such as roads, bridges, and other means of transport, together with communication services, are services to marketing that can be expected of a government in reducing transaction costs.

The provision of organized markets - local assembly, wholesale, retail, at convenient places - is a similar central or local public responsibility. The assembly and dissemination of information on crop prospects and prices and supplies in producer, wholesale and retail markets is also needed because it can usually be undertaken more efficiently on behalf of all market participants than by any one individual. The development of a banking system oriented to financing marketing operations may also need government assistance. Government may also be called upon to help the poorer and more socially-handicapped stratum of farmers (Abbott, 1987). At the level of legal procedure, the state is necessary to guarantee property rights, to specify acceptable terms and

conditions of contract, to sanction lack of adherence to contracts, and to provide physical infrastructure and other public goods for markets. This in line with North (2000) who sees the role of the state as crucial in specifying property rights and enforcing contracts, both of which promote specialisation and reduce the costs of market exchange.

1.4.2 Private sector role in marketing

The private marketing enterprise is one in which the capital is owned directly by the managers of the enterprise, by these managers in partnership with others, or by private investors who have acquired shares in such a company. In most African countries, private enterprises are the most numerous of those engaged in marketing food and agricultural products (Abbott,1987). This private sector, which often operates alongside marketing co-operatives and state marketing organisations, contains an important and often underused reservoir of dynamic marketing entrepreneurship (Harper and Kavura,1982). The productivity of small farmers cannot be successfully increased without effective marketing systems for both their products and the inputs they require. An effective marketing system encourages increased agricultural production of the right products by offering incentive prices.

If the marketer (the middleman) is in continuous contact with small farmers in rural markets or on the farm itself, he can guide them to the market and improve their productivity through the adoption of better farming methods and modern inputs. Partly, the marketing system can be improved by improving communications (building and improving feeder roads, telephone and mail links). However, one essential instrument of rural development is the dynamic small and medium-scale marketing entrepreneurs who consistently promote sales and search for new market outlets

as well as organise other marketing operations such as assembly, storage, processing, distribution, financing and pricing. In spite of the efforts of many governments and co-operatives, the private sector in fact handles the bulk of agricultural and food products in developing countries (Harper and Kavura, 1982). Also, despite the difficult conditions under which these marketers often operate, they make considerable contributions to rural development by opening new marketing channels and extending existing ones in response to the rapid increase in the demand for food in urban areas. These private entrepreneurs not only create their own employment, but also create employment for others and provide a service for hundreds or even thousands of farmers and consumers (Harper and Kavura, 1982).

Small and medium-scale type of private enterprises will continue to play an important and expanding role in agricultural marketing in most developing countries. Therefore, sufficient attention should be paid to the ways in which they can be used and assisted in performing effective roles in rural development. The least a government could do is to attempt to create an environment which is conducive to the establishment and growth of small private marketing entrepreneurship and also to recognise and acknowledge the important role of the individual private entrepreneur. In short, an effective integration of private marketing enterprises into the national agricultural, rural and marketing policies should be considered (Harper and Kavura, 1982).

1.5 INFRASTRUCTURAL DEVELOPMENT AND MARKET ACCESS

1.5.1 Infrastructural development

Transport, telecommunications, and power (electricity) are the "hardcore" elements of infrastructural elements as they are basic to numerous economic activities. In addition, the constraints imposed by underdevelopment of many other infrastructural elements (e.g. health services, education and training) could be alleviated once the hardcore elements are solidly in place, that is, as transport and communication systems develop, law and order improve, market imperfections and failures are reduced, and access to health, education, and electricity facilities is enhanced. In this way, transport and communications are the leading elements of infrastructural development (Ahmed, 1993).

Indirect benefits from infrastructural development may not be easily recognized as potential users and may not always strongly state their preferences. In general, a government has to be perceptive to recognize the potential demand and to act accordingly as a supplier of infrastructural facilities. These benefits can be complex but comprehensive. Conventionally, the economic factor that has been instrumental in the formation of views on the benefits from infrastructural investment at the policymaking level is the concept of "user cost savings" arising from investment relative to investment cost (Ahmed, 1993).

1.5.1.1 User cost saving approach

To estimate the user cost savings as a measure of benefits, for instance from a road project, is shown in figure 1.1 where DD is the demand curve for transport services, while the horizontal axis represents volume of traffic and the vertical axis represents the unit cost of transportation.

With walking and headload as means of transportation (before the road project), the unit cost is OC_1 and the volume of traffic OQ_1. This cost is reduced to OC_2 when the road project is developed. This reduction also induces additional traffic (OQ_2 - OQ_1), which is determined by the elasticity of DD. The total benefits from the development of the road are given by the area AC_1C_2B which consists of two components:

Cost savings on existing traffic = AC_1C_2E; and

Cost savings on generated traffic = ½ (C_1C_2) (OQ_2 - OQ_1) = AEB

This conventional approach would fit developed economies where resources are fully employed.

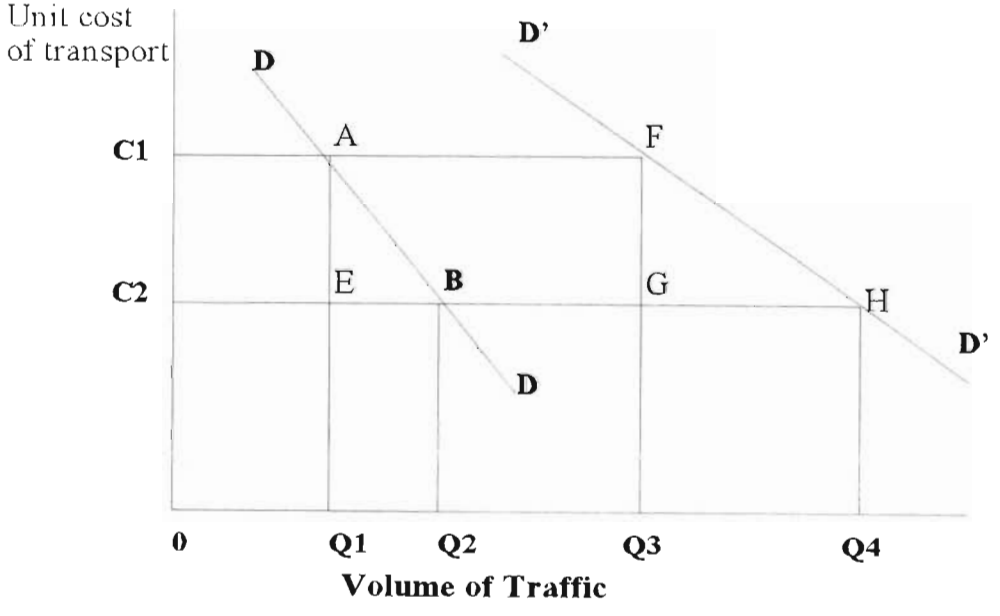

Figure 1.1. User Cost Saving Approach

Source: Ahmed,1993

However, in developing economies, as is the case of the two study areas (Impendle and Swayimana), where resources are under-utilised and imperfect markets exist, road development

can be expected to bring about substantial structural change. If this happens, the demand curve will shift to the right to D'D' under which the benefit from additional traffic generated will be ABHF, which is much larger than the benefit AEB from additional traffic under the previous case (DD). This approach, however, takes into account only traded goods, i.e. goods that are transported from one location to the other and also may not reflect effects on employment.

1.5.1.2 Impact of infrastructure

Development economists have for long suggested that the creation of an infrastructure generates external economies resulting in widespread benefits (Ahmed and Donavan, 1992). Figure 1.2 shows how traditional theory conceptualizes the effects of infrastructural development on production for a competitive market economy. In a situation of inadequately developed infrastructure, as is the case in Impendle and Swayimana, farms are faced with higher marginal cost (MC1) at every level of production, and given the market price of their output, produce at Q1.

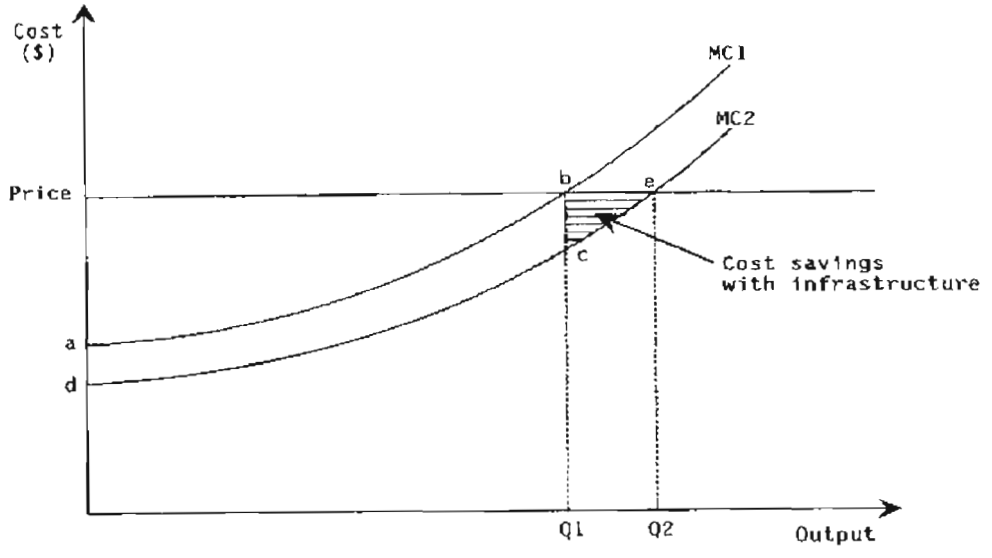

Figure 1.2 Infrastructure provision and the efficiency of production

Source: Ahmed and Donavan, 1992

With an improvement in infrastructure, the marginal cost curve shifts downward to the right (MC2), resulting in a total cost savings of area *abcd* for the previous level of output, Q1, and an increase in output from Q1 to Q2. Area *bce* represents the cost saved because of improved infrastructure. Interaction between physical and institutional infrastructure is very important.

Physical infrastructure, such as a road provided at public cost, is intended to create a condition that will induce supplementary investment from private entrepreneurs (transportation vehicles, shops, industries). Public investment in building marketplaces at appropriate locations has been very productive (Ahmed, 1993). Ahmed (1993) contends that this type of investment cost is the easiest to recover from users. Without this public investment, scattered roadside shops and periodic markets become a common feature. Irregular roadside markets are inefficient in exchanging market information. Thus, public investment in development of marketplaces within the communal areas with new or improved infrastructure is essential for the growth of marketplaces and exchange centres. Any formulation of rules for the conduct of these marketplaces should ensure that there is no restriction on movement, no exploitative local taxes on traders, and that there is adjudication readily in place to resolve trade disputes (Ahmed,1993).

Ideally, infrastructural development is supposed to promote an environment for the healthy growth of private entrepreneurship so that the public sector need not enter into direct production and marketing. Infrastructure, particularly transport infrastructure, is meant to increase mobility of goods, knowledge and people. Once infrastructural development is achieved, future research can focus on its effects on market development, agricultural production, household income (particularly from nonagricultural sources), employment, consumption and buying patterns, savings and investment behaviour. Moreover, the interaction between physical infrastructure and

institutional and technological development can be assessed (Ahmed, 1993).

1.5.2 Market access

Apart from the physical infrastructure that a marketing system requires, institutional infrastructure is of major importance in order to lower transaction costs. The role of the state in establishing that framework is essential. A set of rules and conventions that structures the actions of market participants has to be in place for an efficient marketing system. Shaffer (1980) identified four requirements of a regulatory framework for a decentralized market system to function:

(1) A set of "ordered relations" between economic agents established by legal and social conventions that define and allocate property rights, entitlements, and delineate the legitimate scope of economic behaviour.

(2) Rules about transactions between economic individuals that define rights to exchange property rights, define what may constitute legitimate contracts, permissible and non-permissible forms of cooperation and competition, and establish rules on liability.

(3) A system of authority and legitimacy to enforce these rules, including penalties for delinquency.

(4) Mechanisms by which these rules can be adapted to changing economic and social circumstances while providing a predictable framework for market participants.

Collective activity by small-scale farmers in the communal areas of KwaZulu-Natal is limited and appears to be confined to non-marketing (i.e. production) related operations . There are no support services for marketing of food crops. Market access policies for small farmers should consider four key factors to achieve expected results namely, improvements in access to assets,

information, services and profitable markets. These would facilitate market participation by small-scale farmers in less developed countries or regions (Delgado, 1999).

Table 1.1 shows the four key factors suggested by Delgado (1999) to facilitate market participation. The transfer of resources to resource-limited small and poor farmers as well as access to technical and market information are important to promote market participation by these farmers. Delgado (1999) contends that incentives should be created to allow information or management-rich individuals to share their expertise with small-scale and poor farmers. Access to services and profitable markets is also a further step in the promotion of market participation. The institutional framework and infrastructural factors (roads, market places, telecommunication) affect the level of access to institutional resources and services, which in turn can prevent the development of competitive market conditions (Kormawa and Von Oppen, 1997).

Table 1.1 Important factors in increasing small farmers' market participation in Sub-Saharan Africa and their organizational requirements.

Access to Assets Because of asset-deficit situation smallholders find themselves, it is sometimes necessary to make a net transfer (such as a cow) in order to stimulate entry into agriculture.
Access to Information It is also important that smallholders be supported in acquiring production, marketing information and management skills.
Access to Services Because of poor infrastructure and the unequal distribution of services, the implementation of institutions to share the risk of service delivery to smallholders and to overcome other economies of scale in production is needed.
Access to Remunerative Markets To promote growth of small-scale agriculture, it is important that small-scare farmers have access to profitable markets for high-value items.

Source: Delgado (1999)

In order to succeed, small-scale farmers must access local and regional markets to satisfy needs which are not met by the large-scale food and feed supply networks (Bragg, 1996). This section presents a few alternatives which, if considered, may improve market access for these emerging farmers. Small-scale farmers in rural areas generally do not have the production volumes needed to use advanced packing and handling techniques and find it difficult to access large markets. The importance of a strategic plan is therefore crucial for the survival of emerging farmers. Only three alternatives are introduced here, namely farmers' markets (market places), public markets and marketing associations.

1.5.2.1 Farmers' markets (market places)

A farmers' market is defined as a common facility or area where several farmers or growers gather on a regular basis to sell a variety of fresh fruits and vegetables and other farm products directly to consumers (Bragg,1996). This type of setting would give consumers (or private traders) direct access to fresh fruits and vegetables and other farm products and at the same time provide independent farmers with a profitable sales outlet for their production. Prevalent in most rural areas of the United States, this setting may also contribute to community development and build up community spirit and empowerment (Bragg, 1996).

A physical market place can also be a supermarket for ideas, information, and resources for rural economic development. According to Harriss-White (1999) market places and staple food markets are highly gendered complexes of social institutions. In West Africa, for example, while agricultural production may be controlled by both women and men, local trade in basic

consumption goods has been widely observed as public domain for women, in which not only can competition be fierce but also accumulation possible. He explains that various arguments have been put forward for this situation such as compatibility and cultural.

1.5.2.2 Public markets

Public markets are defined as groups of locally-owned, mainly owner-operated private retail businesses leasing or renting space in a shared facility on a permanent basis with an emphasis on the sale of fresh foods (Bragg, 1996). Private businesses operating in these types of premises may trade in produce such as meats, poultry, fish and seafood, eggs, baked goods, ready-to-eat traditional foods and other related items. A combination of government (local or national) and private funds could be used to construct or renovate this type of market place setting.

1.5.2.3 Marketing associations

These can be considered as groups where emerging farmers can collectively assemble sufficient product volumes to attract buyers for needed shipment to nearby towns (Bragg, 1996). These types of groupings, therefore, can become a source of direct supply for local or nearby towns' grocers and food service operators. Operations that can be undertaken by this type of institution (packing, cooling, sorting, grading, etc.) are still a critical process in the survival of small-scale emerging farmers to access the wider markets (Bragg, 1996). A marketing association should provide timely, accurate and unbiased market information to buyers and sellers of agricultural commodities.

In line with marketing associations, after periods of dissatisfaction, village-level cooperatives are resurgent, as a means of offsetting liquidity constraints, information asymmetries, and minimum efficient scales of production or marketing that can prevent small-scale farmers participation in rapidly agrifood sectors (Holloway, *et al.* 2000). Marketing associations such as cooperative sales organizations among resource-limited farmers have shown to possess the potential of stimulating market participation among dairy producers in peri-urban settings (Holloway, *et al.* 2000). These cooperatives, run by member-farmers are very helpful in overcoming access to barriers to assets, information, services and the markets to sell high-value items.

This is a form of collective action that addresses access problems whereby, participant member-farmers can handle input purchasing and distribution and output marketing. Farmers not only gain the benefit of assured supplies of the right input at the right time, sometimes on credit against output deliveries, and an assured market for the output, but also can be applied equally to all farmers in a given location and time period. Moreover, producer cooperatives can offer processors/marketers the advantage of an assured supply of the commodity at known intervals at a fixed price and a controlled quality. Extension can also be part of the services provided sometimes better than state extension services (Holloway, *et al.* 2000).

In addition to the above-mentioned forms of farmers' organizations, farmers in the two study areas could benefit by linking to a processor, hospital, school, church, or marketer by way of a contract. Widespread contract farming have been emerging in many developing countries, as a means to reduce risk and ensure volumes of known price and quality for downstream processors and distributors (Ghandi *et al* 2000; Jaffee and Morton, 1995). Contract farming provides some of the most lucrative opportunities available to small farmers throughout Africa (Jaffee and

Morton, 1995; Grosh, 1994). With this kind of arrangement, small farmers producing high value items could overcome problems related to access to assets, information, services and markets. However, despite reducing coordination costs within the agrifood chain, there is growing evidence that contracts may not suit the small-scale farmers as far as agroindustrialization is concerned. Further research with respect to communal farmers in KwaZulu-Natal and South Africa could assess mechanisms by which contract farming schemes can be initiated. Equity-sharing schemes with the private sector can also improve agricultural performance in the communal areas. The establishment of such schemes has provided an alternative form of access to finance and markets, management and business skills for new farmers (McKenzie, 1993).

Furthermore, electronic commerce offers unprecedented opportunities for farmers and more broadly for rural areas. For rural areas remote from large centres of population, electronic commerce provides a means for increasing market size and hence commercial viability, at least in developed nations (Blandford and Fulponi, 1998). This, however, does not exclude small-scale farmers in the developing world of getting involved, if the necessary infrastructure, particularly for transport and telecommunications, is available. With e-commerce, transaction costs, particularly transportation costs, are reduced since there is no necessity that goods and their buyers and sellers be physically present at a given location in order to make a transaction (Blandford and Fulponi, 1998). However, requirements to participate in this new form of marketing include computer-literate farmers and a connection to the network on which the virtual market exists.

In conclusion, the transition from subsistence agriculture to full commercial farming would occur only when risk is relatively small, transaction costs are low, and marketing procedures are

relatively easy. Infrastructural development critically influences all these factors. Development policies must give the economy the tools and infrastructure it needs to sustain growth and prosperity in the communal areas of South Africa. A sound physical infrastructure (improved roads and bridges, telecommunications) and a better institutional environment (contract enforcement, safety and security) in these areas will bring economic opportunities. Non "public goods"activities, such as the procurement of seeds, transport, storage and distribution, can be most efficiently carried out by the private sector, whereas those with a "public goods"nature - such as providing an "enabling environment for the development of an efficient private marketing system, ensuring competition, the provision of public infrastructure, such as roads and public markets, a strong legal system for the settlement of trade disputes - are better carried out by the state (Coulter 1994).

Besides creating a facilitating environment where private trade can function efficiently, and providing for functions that cannot be entrusted to the private sector, the state sometimes can provide direct assistance to farmers, traders and other parties involved in the marketing of agricultural products. This direct assistance can be in areas such as market information, technical assistance in crop storage, provision of small-scale milling equipment, and marketing credit to farmers and traders. The state is the means whereby the rights to exchange property rights, rules about liability and penalty for delinquency, and conventions about trade activities are guaranteed (Coulter, 1994).

Thus, the purpose of the New Institutional Economics is both to explain the operation of institutions and their evolution over time, and to evaluate their significant influence on economic performance, efficiency, and distribution. There is a two-way causality between institutions and

economic growth. On the one hand, institutions have a profound influence on economic growth, and on the other hand, economic growth and development often result in a change in institutions.

The next chapter takes a closer look at Transaction Cost Economics and its application to developing agriculture.

CHAPTER 2

SMALL-SCALE FARMERS' MARKET PARTICIPATION UNDER TRANSACTION COSTS

Agricultural marketing is intimately linked with the process of economic development, which rests on the specialisation of production for sale to others. The extent of specialisation depends on an exchange economy, but the rate at which an exchange economy emerges depends on the performance of its marketing system (Warley, 1967). As in the rest of the developing world, increased production and marketing has the potential in much of Africa to generate income and employment on a wide scale, and thus to improve the welfare of populations on an economically sustainable basis (Walshe *et al.*, 1991). In sub-Saharan Africa, smallholder agriculture still accounts for the majority of livelihoods, yet has been subjected in recent years to increasing strains as a viable source of income generation because of high transaction costs and land pressure (Staal *et al.*, 1996). Coase (1937, 1960) studied the costs involved in human interaction and explained the reasons for the existence of firms (1937) and the conditions under which the allocative implications of microeconomic theory are held (1960). But the study of transaction costs, in addition to giving insights into static economic analysis, also holds the key to unlocking the doors to an improved understanding of economic and societal performance through time (North, 1997).

This study hypothesizes that growth in small-scale agriculture is limited by high transaction costs in both production and marketing of products by emerging small-scale farmers. Understanding the nature of these constraints and how they can be alleviated is central to using small-scale agricultural development as a tool to improve rural livelihoods (Delgado, 1996). Inadequate

access to market information and technology, poor physical and institutional infrastructure are the main determinants of the higher fixed transaction costs per unit faced by small-scale farmers in most former homelands of South Africa.

Transaction costs include, among others, the costs of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential partners (and in some cases, officials who can hold up trade) to reach an agreement, transferring the product (this typically involves transportation, processing, packaging, and securing title, if necessary), monitoring the agreement to see that its conditions are fulfilled, and enforcing (or seeking damages for any violation of) the exchange agreement (Staal *et al.*, 1996). Transaction costs, therefore, help explain why aggregate agricultural supply response to relative price changes is often quite slow in Africa (De Janvry and Sadoulet, 1994). The notion that the costs of arranging exchange may reduce or even prevent exchanges from occurring, and may give rise to institutions and organizations to offset their negative impacts, is now widely accepted (Williamson, 1985). Because any transaction or deal is posed in term of a contracting problem, Transaction Cost Economics (TCE) can be used to shed light on a wide range of economic and non-economic arrangements. TCE has been applied to many areas, including industrial organization, corporate governance, labour economics, public choice, development, and economic history. Not only has TCE had numerous applications, but new uses continue to appear (Williamson and Masten, 1999).

Generally, economic data series focus on prices and quantities. TCE, in contrast, requires detailed information on organizational form as well as on attributes of transactions such as the level of uncertainty associated with exchange, the complexity of products and processes, and the extent

to which assets needed for production are specific to a particular relationship. For the most part, transaction cost economists have had to use surveys, regulatory and business archives in order to assess a given phenomenon (Williamson and Masten, 1999). This chapter presents the Transaction Cost Economics (TCE) theory approach and its application to developing agriculture.

2.1 THE THEORY OF TRANSACTION COSTS

Pitelis (1993) states that a renewal of interest in institutions and a reaffirmation of their economic importance can be traced to the early 1960's with Coase's (1960) study on social costs, Alchian's (1961) analysis of property rights and Arrow's (1984) work on the economic properties of information. The basic characteristic of the new line of research is that the concept of a firm as production unit is augmented by the concept of a firm as governance structure (Pitelis, 1993). TCE is part of the New Institutional Economics (NIE) research tradition, and applies to the study of economic organization of all kind (capitalism, socialism, etc.).

Research based on the NIE approach became very popular by 1975, as was discussed in the last chapter. Many of the articles in the *Journal of Economic Behaviour and Organization*, which first began publication in 1980, are in the new institutionalist spirit (Williamson, 1985_b). For raising the issue of costs, Coase (1937) is considered to be the founder of the NIE. Coase (1960) sees the issue of firms, law and the state as major institutional devices in market economies. In this way, he has also been responsible for the multi-institutionalism phase of economic analysis. Today, the list could be extended to include, among others, the family, norms and customs, clan, associations and even religion. Coase's award of the 1991 Nobel Prize in economics confirms the profession's recognition of his contribution (Pitelis, 1993).

An accurate assessment of the economic institutions of capitalism cannot be reached if the central importance of transaction cost economics is denied. That is, a balanced view of the economic institutions of capitalism will need more attention to the sociology of economic organization. In short, the basic principle underlying TCE is that economic institutions will develop to minimize transaction costs (Williamson, 1985_a). But this may not happen due to high transaction costs and political resistance (Lyne *et al.*,1997:64).

Dow (1993) summarizes the analytic theory of TCE as follows: A transaction requires that the members of a group carry out actions. The resulting gains will vary with the actions taken by individual agents. Some of these actions are in form of contracts and a third party (i.e. state) is able and must enforce agreement on contracts. A governance structure is a binding agreement regulating contracts between coalition members, and specifying an authority structure to decide actions not explicitly covered in advance. The transaction cost associated with a governance structure is the difference between the aggregate surplus generated by that structure and the first-best surplus level arising in a hypothetical world where agents can contract at lower or no cost on all relevant actions. An efficient governance structure (i.e. a structure with minimum transaction costs) will be preferred.

2.2 THE TRANSACTION COST ECONOMICS APPROACH

As an approach, TCE adopts a contracting orientation and states that any issue that can be formulated as a contracting problem, can be analysed in transaction cost economizing terms. Every exchange relation qualifies. Some issues which at first may appear to lack a contracting aspect turn out, upon scrutiny, to have an implicit contracting quality (Williamson, 1987).

Furthermore, Williamsom (1987) states that the transaction cost approach draws from both economics and organization theory. With this basis, this approach attempts to identify a set of market or transactional factors which, together with complex contracts involving contingent claims, will be costly to write, execute, and enforce. Faced with such difficulties, and considering the risks that simple, and incomplete, contingent claims contracts pose, the firm may decide to bypass the market and resort to hierarchical modes of organization. Transactions that might otherwise be handled in the market would then be performed internally and governed by administered processes. Uncertainty and the number of exchanges in which one party's choice of trading partners is restricted, are the transactional factors to which market failure is ascribed.

However, Dietrich (1994) argues that to base everything just on exchange may generate an inadequate specification of the particular nature of the firm. Rather, he suggests, the characteristics of the firm also involve the management of a production- distribution process and, to remove the exchange-only limitation, organization and transaction costs should be identified separately. The former is the cost of running firms rather than the cost of running markets. Having identified organization costs, it is then possible to examine the factors underlying their existence.

Williamson (1985_b) points out that transaction costs are always assessed in a comparative institutional way, in which one mode of contracting is compared with another. Accordingly, it is the difference between, rather than the absolute magnitude of, transaction costs that matter. This approach is adopted because transaction costs are often difficult to quantify; however, Dietrich (1994:23) thinks that this difficulty may mask an implicit assumption that alternative governance structures are always feasible.

TCE poses the problem of economic organization as a problem of contracting. A particular task is to be accomplished. It can be organized in any of several alternative ways. Explicit or implicit contract and support apparatus are associated with each. What are the costs? Williamsom (1985_a:24) gives a scenario of a contracting situation in which he distinguishes two approaches: the efficiency and the monopoly approaches. Most of what Williamson (1985_b) refers to as new institutional economics is located on the efficiency branch of contracts, which distinguishes between those approaches in which incentive aspects are emphasized and those which feature the economics of transaction costs.

The incentive aspect deals with the *ex ante* side of a contract. New forms of property rights and complex contracting are thus interpreted as efforts to overcome the incentive deficiencies of simpler property rights and contracting tradition. The property rights part emphasizes that ownership matters, where the rights of ownership of an asset take three parts: the right to use the asset, the right to appropriate returns from the asset, and the right to change the form and/or substance of an asset (Furubotn and Pejovich, 1979). Once the property rights issue is clarified, it can be assumed that utilization thereafter will reflect on the purpose of its owners. Williamson (1985_a) concludes that a successful contracting scheme will be obtained if: (1) the legally sanctioned structure of property rights is respected, and (2) human agents discharge their jobs in accordance with instructions.

Dietrich (1994) thinks that it is fairly simple to remove any inconsistency in TCE. All that is required is the removal of opportunism as one of its central pillars. A framework can then be developed that focuses on bounded rationality and examines the ways that different governance structures foster and constrain opportunism and trust. The development of opportunistic or

trusting behaviour, he adds, will be dependent, in part, on the extent to which governance structures generate convergent perceptions of the society. This is central to understanding the nature of organization and the firm, and is also an important factor underlying the development of quasi-integration strategies. To some extent, Dietrich (1994) suggests that the elements of such a framework are all contained in Williamson's (1985_a) work. But Dow (1993) believes that TCE has had less success in addressing problems of workplace organization and human capital, despite some notable attempts. In particular, he argues that Williamson's writings in this area have stimulated much criticism and controversy and this may be in part because of the greater political sensitivity of the issues involved.

2.3 NATURE OF TRANSACTION COSTS

A fundamental difference between neo-classical, neo-Marxist, and new institutional analysis regards the relative merits of exchange (Ensminger, 1992). While neo-classical economists are inclined to believe that the benefits of exchange outweigh the costs, Marxists (especially dependency theorists) are more inclined to argue that exchange is unequal and therefore detrimental to all but the elite in what they call the peripheral nations (Amin, 1976).

New institutional economists, for their part, would agree with neo-classical economists that economic growth stems from the gains from exchange and that these can be realized for both sides, but they would not accept that such gains are automatic; to do so would be to ignore transaction costs. New institutional economists accept that people may well resist trade as long as the costs of exchange are higher than the perceived benefits, and they would also accept the

possibility of the Marxist prediction that some may be made worse off as a result of unequal distribution of the new benefits (Ensminger, 1992).

Arrow , the first author to use the term "transaction costs" (Dietrich,1994:19), claims that market failure is not absolute; it is better to consider a broader category, that of transaction costs, which in general prevent and in certain cases block the formation of markets; such costs are the costs of running the economic system. Williamson (1985_a) follows Arrow's (1963) definition of transaction costs as the costs of running the economic system, and as such they are equivalent to "friction" in the physical sciences. In more detail: *ex ante* transaction costs are the costs of drafting, negotiating and safeguarding an agreement. *Ex post* transaction costs include:

1. The costs incurred when transactions drift out of line with the requirements. Suppose that the contract stipulates "*x*" but the parties discover later on that they should have done "*y*". Correcting this situation may not be easy and may involve some costs.

2. The costs incurred if bilateral efforts are made to correct *ex post* irregularities.

3. The set-up and running costs associated with the governance structures to which the disputes are referred.

4. The bonding costs of effectively securing commitments.

Ex ante and *Ex post* costs are interdependent and must be dealt with simultaneously rather than separately (Williamson, 1985_a).

Williamson (1985_a) thinks that the existence of transaction costs depends on three factors: bounded rationality, opportunistic behaviour and asset specificity. Opportunistic behaviour manifests itself as adverse selection, moral hazard, cheating, shirking, and other forms of strategic behaviour. If these three factors are not all present, transaction costs will not exist. Given the

existence of contracting problems (that is, the existence of the mentioned three factors), TCE should be able to specify the governance structures that can efficiently manage economic activities in any situation.

Dietrich (1994) defines transaction costs in terms of three factors: search and information costs, bargaining and decision costs, and policing and enforcement costs. If attention is restricted to firms rather than final consumers, he adds, these factors can be recast in terms of the management costs associated with the preparation and enforcement of contracts. This allows transaction costs to be viewed as production costs and analysed accordingly. For his part, North (1997) thinks of transaction costs as the costs of measuring what is being exchanged and enforcing agreements. In the larger context, they are the costs involved in human interaction over time.

According to Eggerston (1990:15), transaction costs arise when households exchange ownership rights for economic assets and enforce their exclusive rights. These costs include expenses and opportunity costs arising from the exchange of property rights, and originate mainly from the following activities:

- Search of market information (i.e prices, quality, partners or customers).
- Bargaining with contracting parties
- Defining contracts guidelines, monitoring and enforcing of the contract.

Drabenstott (1995) sees transaction costs as perceived risk, transportation, and administrative costs while Staal *et al* (1996) and Delgado (1996) grouped transaction costs into observable and inhibitive (i.e. unobservable). Observable transaction costs include marketing costs such as transport, handling, packaging, storage and spoilage. These costs are observable when an

exchange takes place. The unobservable transaction costs include the costs of search, bargaining, screening, monitoring, co-ordination and enforcement. Delgado (1997) argues that these are the costs of participating in the market process, whether or not a market exists.

Furthermore, Hobbs (1997) classified transaction costs into information, negotiation, and monitoring or enforcement costs. Information costs arise *ex ante* of an exchange and include the costs of obtaining price and product information and the costs of identifying a suitable partner. Negotiation costs are the costs physically carrying out the transaction and may include commission costs, the costs of physically negotiating the terms of an exchange, and the costs of formally drawing up contracts. Monitoring or enforcement costs occur *ex post* of a transaction and are the costs of ensuring that the terms of the contract (i.e. quality standards and payment arrangements) are respected by the other parties involved in the transaction.

Zaibet and Dunn (1998) defines transaction costs in terms of risk attitude of farmers and argue that these costs include high transport costs due to the distance of the farm from the market, poor or non-existent infrastructure, high marketing margins due to monopoly power, and high costs of searching and monitoring contracts. Transaction costs also results from information inefficiencies and institutional constraints, such as the absence of formal markets. The presence of transaction costs is often reflected by the discrepancy between perceived buying and selling prices (De Janvry *et al.* 1991). When these discrepancies occur, sellers experience low selling price and consequently discouraged to sell, while buyers experiencing high buying price, become discouraged to buy.

Recently, Key *et al.* (2000) distinguished between proportional and fixed transaction costs. Proportional transaction costs vary with the level of, or the amount involved in, the transaction whereas fixed transaction costs are the same regardless of the level of transaction made.

The limited empirical evidence on the nature and importance of transaction costs is due to a number of conceptual and measurement difficulties (Staal *et al.* 1996). Firstly, when transaction costs are high enough to prevent exchange from occurring, by definition the costs cannot be observed because no transaction exists. Costs associated with organizing and enforcing institutions of exchange are often difficult to document. Also, an accurate assessment of observable transaction costs and their behavioural implications imply a significant commitment of resources for data collection. This is due to the need to examine all agents (not only producers), in what is often diverse marketing channels, simultaneously and for a period of time sufficient to capture inter- seasonal variation in costs and marketing decisions.

Most existing studies dealing empirically with transaction costs have instead attempted to infer the magnitude of transaction costs, based on the observed behaviour of participating and non-participating agents in the marketing channels (Goetz, 1992). The magnitude and impacts of transaction costs can also be inferred from the marketing behaviour of producers of various sizes in different locations (Debrah and Anteneh, 1991). Comprehensive analyses on the impact of transaction costs on the use of land and credit by the small-scale farmers in the former KwaZulu homeland show the importance of these costs (Thomson,1996). The present study would supplement those analyses by investigating transaction costs in marketing for emerging farmers in the region.

In the absence of direct estimates of the transaction costs incurred by economic agents in the marketing chain, discussion can centre on the indirect evidence of the nature and behavioural implications of transaction costs. The guiding hypothesis is that the influence of transaction costs can be explored through differences in observed marketing costs, marketing channels used, costs of inputs (including the capital necessary for entry), and prices received for their agricultural products. The role of organization in reducing transaction costs is explored through differences in the prevalence of co-operatives (or other provisions), and resultant differences in marketing patterns (Staal *et al.*, 1996).

Coase (1960) concludes that the neo-classical paradigm will yield its predictive results only in the absence of transaction costs. Every trade agreement involves a contract that must be defined and enforced. The costs of defining and enforcing contracts are what constitute transaction costs. Transaction costs are therefore important as they determine which type of contracts will be entered into, or whether costs may preclude contracting. In order for goods to be exchanged and realize their highest market value, the property rights to the goods must be well defined. A clear definition of property rights therefore reduces transaction costs by creating certainty in exchange of the goods. However, the process of defining and enforcing a property rights system is not without costs (Thomson, 1996).

The nature of transaction costs renders a full accounting of their characteristics and impacts difficult. Yet, opportunities exist to better document transaction costs that are in principle observable (Delgado and Siamwalla,1997).These observable transaction costs include: the opportunity costs of time spent by producers in marketing, direct transportation and processing costs, losses due to spoilage resulting from uncertain market outlets, and the degree to which

market outlets used by producers change over time (resulting in additional search costs). A non-exhaustive list of relevant transaction costs affecting the exchange of agricultural products in developing countries is (Hoff *et al.*,1993):

- Spoilage,
- Quality differences depending on processing,
- Lumpiness of initial investments,
- Lags in production,
- Seasonal variability,
- Search costs,
- Screening trade partners,
- Bargaining,
- Monitoring,
- Contract enforcement.

In addition, location issues such as transport, handling, packaging and temporal costs (such as storage) should be included (Delgado and Siamwalla,1997).

Simon (1978) observes that the comparison of two different marketing structures can be rather simple. This can be done without any mathematical demonstrations or calculations. In general, the right arguments will be enough to demonstrate the difference between two quantities using different market venues in dealing with transaction costs. Empirical research on transaction costs almost never attempts to measure such costs directly. Instead, the question is whether organizational relations (contracting practices, governance structures) line up with the attributes of transactions as predicted by transaction cost reasoning or not. However, Goetz (1992) suggests that a selectivity model can be used in which households are switched into alternative market

participation states (those who engage in commercial agriculture versus those who stay out). Failure to participate in markets results from high fixed transaction costs. He suggests the use of multivariate statistical techniques to distinguish between two or more groups of cases.

2.4 HISTORICAL DEVELOPMENT OF THE INSTITUTIONAL ENVIRONMENT IN RURAL KWAZULU-NATAL.

This section briefly reviews the historical development of institutions in the province in order to understand the dimensions of transaction costs faced by communal farmers in rural KwaZulu-Natal. At present much-needed infrastructure developments (such as electricity, water and telecommunication services) are being undertaken in the communal areas of KwaZulu-Natal. However, the province's fragmented institutional structure needs to be understood in terms of the historical development of the present system (Harrison, 1993; Forsyth, 1995). As a result of the 1910 Act of Union, the area now known as KwaZulu-Natal was constituted as a province (Natal), and a separate black homeland (KwaZulu) within the Union of South Africa. After 1948, attempts at making black homelands "independent" of South Africa resulted in the creation of the self-governing territory of KwaZulu in 1972. The province of Natal (part of the Republic of South Africa) and the self-governing territory of KwaZulu coexisted until the formation of the Government of National Unity in 1994. In terms of the interim constitution, KwaZulu and Natal were united as the present province of KwaZulu-Natal.

While the rural areas of Natal were relatively well served by an adequately funded and staffed provincial administration during the period 1972-94, the same could not be said for the self-governing territory of KwaZulu, which had little institutional capacity and so lacked the means

to be truly independent of the South African state (Barnes and Morris,1997). Some attempts were made to resolve problems resulting from territorial segregation under apartheid. A number of multilateral and coordinatory structures such as the Development Bank of Southern Africa and regional advisory committees were set up in the 1980's and early 1990's. Further initiatives for Natal and KwaZulu included the establishment of a Joint Executive Authority (JEA) in 1987 and Joint Services Boards (JSB) in 1990.

However, these attempts at transcending apartheid boundaries were undermined by constitutional changes which served to further fragment the country's institutional environment, and even more importantly, South African society (Barnes and Morris,1997). Although the 1980's and early 1990's did see an increase in the number of development organisations in rural KwaZulu and Natal, the manner in which they were constituted, and the institutional environment in which they found themselves, ensured their failure as viable development mechanisms owing to the large number of organisations and their overlapping responsibilities. The direct result of such a confused and complex institutional environment in the province was the undermining of development initiatives, particularly in rural areas (Barnes and Morris,1997).

Barnes and Morris (1997) argue that many of the major service-oriented development organisations in the province are still experiencing the same problems they experienced during the apartheid era. Apartheid-based legislation in South Africa has left rural KwaZulu-Natal with an extremely complex and inefficient institutional environment. It failed in terms of efficiency, adaptability, transparency and equitability for the following reasons(Barnes and Morris, 1997):

- no clear policy parameters defining organizational responsibility existed within the province;
- no autonomous tier of local government existed;

- the traditional authority question remained unresolved;

- there were parallel service delivery structures;

- community participation in service delivery was poorly coordinated and to some extent rural violence also undermined service delivery.

Still, as Harrison (1993) pointed out, despite these shortcomings, a window of opportunity exists, a chance to take what is good from the old, and create whatever else is needed to ensure a new, far more efficient institutional environment for KwaZulu-Natal.

2.5 MODELS OF HOUSEHOLD MARKET PARTICIPATION UNDER TRANSACTION COSTS

Two important empirical models developed by Key *et al.*(2000) and Goetz (1992) inspired the specification model of the present study. It is, however important to note that while the two models have the decision on whether to participate or not in markets (and if so how?) as their focus, the scope of the present study is limited to identifying strategic transaction cost/household characteristics affecting the depth and quality of marketing channels used which, in turn, determine the level of crop income generated by participating communal farmers in the study areas.

A typical farm household model framework incorporating transaction costs was developed by Key *et al.* (2000:246-250). The model specified market participation as a choice variable so that besides the decision on how much of each good (*i*) to consume (c_i) , produce (q_i) , and use as an input (x_i), the household would also decide on how much of each product to sell (m_i) , where m_i

is positive when it is a sale and negative otherwise. In the absence of transaction costs, the household's objective is to maximise the utility function (1) subject to (2)-(5):

$$u(c; z_u) \qquad (1)$$

$$\sum_{i=1}^{N} p_i^m m_i + T = 0 \quad (2)$$

$$q_i - x_i + A_i - m_i - c_i = 0, \; i = 1, \ldots, N \qquad (3)$$

$$G(q, x; Z_q) = 0 \qquad (4)$$

$$c_i, q_i x_i \geq 0 \qquad (5)$$

where p_i^m represents the market price of product i, A_i is an inventory in good i, T is the exogenous transfers (i.e. welfare or disability payments) and other incomes, z_u and z_q represent exogenous shifters in utility and production, respectively, while G is the production technology. The full income constraint (2) indicates that consumption can only be equal to or less ($\leq$) than the value of production and transfers. The resource balance equation (3) shows that for each of the product N goods, the quantity consumed, used as input, and sold should be equal to what is produced and bought and the endowment of the product. The production technology equation (4) identifies inputs with outputs. However, when factors reflecting both variable and fixed transaction costs in monetary terms are included, the cash constraint equation becomes

$$\sum_{i=1}^{N}\begin{bmatrix}\left(p_i^m - t_{vi}^s(z_t^s)\right)\delta_i^s \\ \\ +\left(p_i^m + t_{vi}^b(z_t^b)\right)\delta_i^b\end{bmatrix} m_i$$

$$- t_{fi}^s(z_t^s)\delta_i^s - t_{fi}^b(z_t^b)\delta_i^b + T = 0 \qquad (6)$$

where the household pays the fixed transaction cost t_{fi}^s if it sells good i, and pays t_{fi}^b if it buys it. δ_i^s is equal to one if $m_i > 0$ and zero otherwise, and δ_i^b is equal to one if $m_i < 0$ and zero otherwise. The price received by the seller is lower than the market price p_i^m by the unobservable amount t_{vi}^s, and the price paid by the buyer is greater than p_i^m by the unobservable amount t_{vi}^b. Both variable (t_{vi}) and fixed (t_{fi}) transaction costs are generally unobservable, though, exogenous factors, z_t^s and z_t^b can be observed to explain these costs when selling and buying, respectively. Therefore, with both types of transaction costs, the household problem can be expressed by equations (1) and (3)-(6). Transaction costs increase the price paid by a buyer and decrease the price received by a seller, as depicted in Figure 2.1.

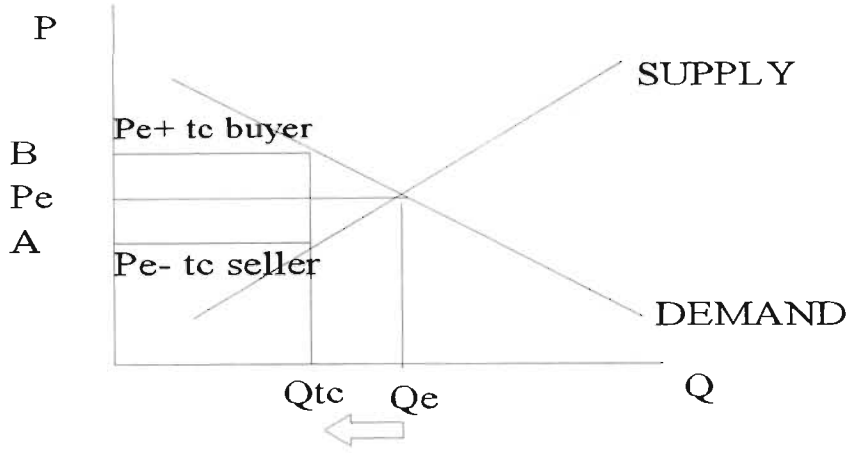

Figure 2.1 Market participation under transaction costs.

Source: Adapted and Simplified from Key *et al* (2000)

The rationality behind transaction cost theory is that transaction costs determine where products are sold and at what price. This in turn determines the volume of traded outputs. Figure 2.1 describes the expected effects of transaction costs on producer and consumer prices and the subsequent effect on the quantity of goods exchanged. The existence of transaction costs will lower the price received by a seller, thus discouraging market participation on the one hand. On the other hand, transaction costs raise the effective value of production consumed by the household, resulting in a higher level of own consumption and a lower level of market participation.

Transaction costs include, among other, transportation and marketing costs that may be unobservable or cannot be easily recorded (Key *et al*. 2000). Equations 3 - 6 show that

transaction costs do not exist for non-participating households, and fixed transaction costs (t_{fi}) will determine whether the household participates or not. Furthermore, conditional on market participation, the supply and demand equations for a household facing both variable and fixed transaction costs can be derived by defining the Lagrangian:

$$
\begin{aligned}
L = {} & u(c; z_u) \\
& + \sum_{i=1}^{N} \mu(q_i - x_i + A_i - m_i - c_i) \\
& + \phi G(q, x; z_q) + \lambda \left[\sum_{i=1}^{N} \begin{bmatrix} (p_i^m - t_{vi}^s)\delta_i^s \\ +(p_i^m + t_{vi}^b)\delta_i^b \end{bmatrix} m_i - t_{fi}^s \delta_i^s - t_{fi}^b \delta_i^b + T \right]
\end{aligned}
$$

where μ,φ, and λ are the Lagrange multipliers associated with the resource balance, the technology constraint, and the income constraint, respectively. Fixed transaction costs would create discontinuities in the Lagrangian; therefore, in order to find the optimal solution, Key *et al.*(2000) suggest a two-step solution. Firstly, conditional on market participation, the optimal solution is solved for, and then the depth of participation which leads to the highest level of utility is chosen.

Once transaction costs are specified as constraints, it is possible to obtain the conditional optimal supply and demand for that constraint by solving for the first order conditions, which are:

For consumed goods:

$$\frac{\partial U}{\partial C_i} - \mu_i = 0, \quad i \in \{i | c_i > 0\} \qquad (7)$$

For outputs:

$$\mu_i + \phi \frac{\partial G}{\partial q_i} = 0, \quad i \in \{i | q_i > 0\} \qquad (8)$$

For inputs

$$-\mu_i + \phi \frac{\partial G}{\partial x_i} = 0 \quad i \in \{i | x_i > 0\} \qquad (9)$$

For marketed goods:

$$-\mu_i + \lambda\left[(p_i^m - t_{vi}^s)\delta_i^s + (p_i^m + t_{vi}^b)\delta_i^b\right] = 0$$
$$i \in \{i | m_i \neq 0\}. \qquad (10)$$

The decision price p_i is defined as:

$$p_i = \left\{ \begin{array}{l} p_i^m - t_{vi}^s \ \ if \ \ m_i > 0, \ seller \\ p_i^m + t_{vi}^b \ if \ \ m_i < 0, \ buyer \\ \tilde{p} = \dfrac{\mu_i}{\lambda} \ if \ \ m_i = 0, \ self - sufficient. \end{array} \right\}$$

P_i is the unobservable internal shadow price μ_i / λ when the household does not trade produced goods, and when goods are traded, the household's decision price will include variable transaction costs. Using the decision price p_i defined above, the first order conditions (7) to (10) are the same as those resulting from the separable producer and consumer problems. From here it is possible

to establish the conditions which determine the market participation of a household facing variable and fixed transaction costs. Market participation is determined by comparing the utility obtained from selling, buying, and remaining self-sufficient. The corresponding functional relations for output supply under transaction costs are given by:

1. *if* $q\left(p^m - t_v^s, z_q\right) > \underline{q^s}\left(t_f^s, z_q, z_u, T, A\right)$,

then output supply for a seller household is:

$q^s = q\left(p^m - t_v^s, z_q\right)$

2. *if* $q\left(p^m - t_v^s, z_q\right) \leq \underline{q^s}\left(t_f^s, z_q, z_u, T, A\right)$ *and*

$q\left(p^m + t_v^b, z_q\right) \geq \underline{q^b}\left(t_b^s, z_q, z_u, T, A\right)$,

then output supply for *self sufficient* household is:

$q^a = \left(\tilde{p}, z_q\right)$

with $\tilde{p}$ defined by

$c + x - A = q$

3. if $q\left(p^m + t_v^b, z_q\right) < \underline{q^b}\left(t_b^s, z_q, z_u, T, A\right)$,

then output supply for a buyer household is:

$q^b = q\left(p^m + t_v^b, z_q\right)$

Aggregate supply will respond to changes in the transaction cost structure through its effect on market participation; therefore, policies that reduce these costs are important complements to price policies in affecting supply response (Key *et al.* 2000). Consequently, transaction costs have

been used to explain why a market might be missing, for instance, in land markets (Carter and Mesbah, 1993; Thompson, 1996), in product markets (Stiglitz, 1998) and in credit markets (Besley, 1994). As a result of these market failures, alternative institutional arrangements (Delgado, 1999) such as sharecropping, interlinking and interlocking of markets are initiated (Biswanger *et al.*, 1993).

2.6 REVIEW OF RELATED EMPIRICAL STUDIES

Various studies have dealt with the impact of transaction costs on market (i.e. outputs, inputs, credit) participation by farmers in developed and developing countries. According to Hirsh *et al.* (1996), there are two main approaches to studying transaction costs. First, as explanatory (independent) variables explaining the behaviour of a certain production unit or firm, as prescribed by Williamson (1985_a), and secondly as a response variable affected by various factors, as explained by North (1997). Given the nature of transaction costs (sometimes unobservable), many studies dealing with these costs use household characteristics to assess their impact. This is possible because market failure is household-specific (Goetz, 1992) as well as commodity specific (Delgado, 1999). Transaction costs revolve around market information and the institutional setting around it. These costs are thus associated with the lack of, or access to, various sources (i.e. formal or informal) of market information.

A detailed review of the research and studies on the effect and impact of transaction costs on households and the subsequent institutions adopted to lower them shows mixed results. This may be explained by the nature of transaction costs under investigation. On the basis of the existing research, however, it is evident that market participation that ultimately determines the level of

income generated from trade is influenced by various factors, including physical and institutional infrastructure, and household characteristics. Their effects may be positive or negative, and the actual level of income generated will depend on the level of transaction costs faced by a household. A number of studies abroad and in South Africa show the relevance of this subject for the market integration of resource-limited subsistence farmers in order to uplift rural standards. Transaction costs are dominant in input and output markets, whether the focus is on capital (credit), fertiliser or adoption of technology, land or labour, marketing channels or market information. Generally, ownership of assets and access to market outlets influence the participation in such markets.

In many or probably most developing countries, smallholders account for the bulk of agricultural production and make up the largest segment of the rural population (Ruthenberg, 1985). The two main features that small farms in the tropics have in common are:

1. For the most part, the agricultural work is carried out by the family rather than by hired labour.
2. A large part of the subsistence requirements of the family are met directly from production on the farm.

These characteristics, combined with generally low levels of productivity, the absence of modern forms of mechanization and the low degree of specialization, imply that the output of small farms in the tropics is limited. A small farm in Africa certainly refers to a much smaller unit than what is understood by a small farm in Europe or North America (Ruthenberg, 1985). Where there is no land scarcity, the lower limit in terms of arable land is determined by the family's subsistence needs, at the minimum generally between one and two hectares of cultivated land for a family of six. The upper limit is determined by family size and the amount of land a man or woman can

cultivate at the given technological level (Ruthenberg,1985). If development is sought in general economic terms and in terms of agricultural and food production, it is these small agricultural units that have to be mobilized on a massive scale. For the mobilization of this capacity, both technical and institutional change are required (Ruthenberg,1985).

Marketing studies are primarily geared toward identifying areas for improvement in marketing in order to foster economic development. The empirical finding that many households fail to participate in markets is explained by transaction costs (De Janvry and Sadoulet,1994). These costs drive a wedge between household buying and selling prices, which is based on the concept of nontraded goods (Goetz,1992).

Dealing with financial constraints and access to credit by small-scale farmers, Ahmed (1989) compared transaction costs of borrowing from formal and informal sources in rural Bangladesh. The study showed that transaction costs resulting from loans from formal lenders were higher than those of loans from informal lenders. The study concluded that transaction costs per unit of loan decrease with loan size, and that this was much faster for formal than informal loans. These conclusions agree with the findings of Cuevas and Graham (1986) and Chung (1993) in which borrower transaction costs were found to be the primary reason in the choice of credit sources by farmers. Similar observations were also made in the study of the informal finance sector in Malawi (Chipeta and Mkandawire, 1996).

Other studies looked at the use of fertilizer, mechanisation and labour. Zaibet and Dunn (1998) used size and ownership of land, number of plots, district location, and existence of annual crops as proxies for transaction costs. Their study investigated the assumption that larger family

ownership systems, as opposed to restricted family ownership systems, and farm size are the main factors for increased risk aversion and transaction costs in market participation. The study found that only the nuclear family had a significant and positive correlation with the purchase of fertilisers. With respect to mechanisation and labour hiring, the estimate of ownership was positive but not significant. A large farm size was found to be significantly and positively correlated to mechanisation and labour use. According to Strasberg *et al.* (1999), the use of fertiliser nutrients depended mainly on the distance to tarred road, assets such as the value of agricultural equipment owned, value of the livestock owned, and human resource factors.

Some studies have examined the effect of transaction costs on output markets in Sub-Saharan Africa (Goetz,1992; Omamo,1998; Key *et al.* 2000; Gabre-Madhin,1999; Staal *et al.*1996; Holloway *et al.* 2000). Goetz (1992) studied household grain marketing behaviour in Senegal by separating the decision of whether or not to participate in markets from the decision of how much to sell or buy, conditional on participation. The study identified important variables reflecting transaction costs which affected coarse grain marketing behaviour of rural households in Senegal. Fixed transaction cost proxies included, among others, variables such as the ownership of a cart for transporting goods to the market, physical distance from market, ethnicity and age of the household head. The study found that the probability of buying, and the quantity bought and sold were influenced by the grain price. However, other factors, such as better market information, significantly raised the probability of market participation of selling households, while access to coarse grain processing technology significantly increased quantities sold by sellers. In regions with thin markets, it is costly (time consuming) to discover trading opportunities. Similarly, poor market access due to lack of transport, distance, and barriers such as ethnicity and languages, increase a household's cost of observing market prices to make transaction decisions (Goetz,1992).

Adopting the same line of investigation as Goetz, Key *et al.* (2000) evaluated market participation for maize in Mexico. Fixed and proportional transaction costs were found to play a significant role in explaining household decisions. The proportional transaction costs were more determinant in the selling rather than the buying decisions, with selling through official outlets significantly increasing the production and selling capacity for the sellers. The study also showed that the ownership of a pick-up truck was associated with a lower production threshold, implying that ownership of assets tends to reduce entry obstacles into the market.

Holloway *et al.*(2000) sought to identify various techniques for an effective participation by peri-urban milk producers in the Ethiopian highlands. Their findings suggested that in order to promote entry into the market, institutional innovation should be accompanied by a mix of various factors, including improved physical infrastructure, knowledge and market information, and asset accumulation in the household. In addition, they found that by locating potential buyers, the time required to market milk could be minimised, thus increasing the number of participating producers and the level of marketable surplus. These findings are in line with Staal *et al.* (1996), who showed that transaction costs increase with distance, most likely faster than could be expected from simple transportation costs. This is caused by the increased costs of information, and risk of wastage or spoilage when a buyer is not found in time.

Staal *et al.*(2000) used GIS-derived variables for distance and transport costs together with survey-derived variables for household characteristics to model market participation and the formation of farm-level milk prices. Differences were made between the effects of roads by type and distance which pointed to the importance of milk production density and the state of market infrastructure.

A transaction cost approach was also used by Omamo (1998) in determining that households devoted their resources to low-yielding food crops than to cash crops with higher market returns in the Siaya district of Kenya. The results indicated that transport costs were the main determinants in the cropping and selling choice whereby relatively more land is devoted to cash crops and less to food crops when the households are closer to markets. Similar results were also found by Fafchamps (1992) when investigating food price volatility and rural market integration. The study concluded that while better roads and transportation seemed to equalise price movements across a larger regional market, the food prices was increasingly dissociated from local supply and demand conditions. In addition, Minot (1999) found that transaction costs, especially transportation costs, not only decreased market surplus but also substantially reduced the elasticity of supply and demand.

The transaction costs approach was also applied in the choice of marketing channels in rural England (Hobbs, 1997). The study reported that transaction cost variables, including grade uncertainty, risk of not selling, and time spent at auction, were the important factors determining the choice of either live-ring auction or direct-to-packer sales. For his part, Gabre-Madhin (1999) assessed the output markets by investigating at the transaction cost factors which determined the choice of market institutions, such as grain brokers in Ethiopia. Traders first determined where to trade and then chose whether to use a broker to search for customers. The study concluded that high transaction costs shown by traders' individual rationality in selecting brokerage was linked to increased broker use, while high social capital reduced the use of brokers. Fafchamps and Minten (2001) analysed property rights in the Malagasy flea market, and found that social capital or networks played an important role in the resolution of dispute among traders, implying that trust-based relationships were the dominant contract enforcement mechanism among them.

Minten (1995) examined the price transmission and transaction costs in a liberalized food marketing system in Zaire. The focus was on search and uncertainty as underlying causes of transaction costs. A model incorporating uncertainty of input costs in the marketing margin was used to explain why producer prices decrease faster than transportation costs increase for every kilometre travelled. Using a transportation cost and producer price share function for the trader, it is shown empirically that this effect holds especially on dirt roads and less on paved roads and rivers.

Frank and Henderson's (1992) analysis of vertical coordination in the United States food industries supports the hypothesis that transaction costs are a primary motivation for vertically coordinating via nonmarket arrangements. The authors concluded that the most influential transaction cost factors were related to uncertainty, input supplier concentration, asset specificity, and scale economies. Comparing vertical coordination measures that only capture product flow interdependencies with other specifications that incorporate coordinating methods as well, revealed the importance of nonmarket exchange mechanisms in reducing transactional inefficiencies.

Delgado and Siamwalla (1997) explained that high value products in developing countries tend to be subject to very high transaction costs for market entry by smallholder producers. These high transaction costs vary across rural households as they are based on differential access to assets and information. To some extent, they noticed, this is true outside Africa as well, except that the institutional base for reducing these costs is especially weak in economies at early stages of agricultural transformation. Farm diversification in the sense of identifying promising tradable agricultural outputs seems a necessity for both growth and equity, through agricultural research,

infrastructure investment, and appropriate institutional development (Delgado and Siamwalla, 1997).

In a similar study on smallholder dairying under transaction costs in east Africa (Kenya and Ethiopia), Staal *et al.* (1996) showed the role of transaction costs in smallholder dairy marketing. Transaction costs in east African dairy were high as evidenced by the low percentage of milk production that was commercialized in Kenya and Ethiopia, compared to that in developed countries. Transaction costs increase with distance, most likely faster than transportation costs alone, due to the increased costs of information and risk of dairy product spoilage before a buyer is found. They also suggested that the role of organizations of collective action (such as processing parastatals, cooperatives, "self- help" groups, etc.) in reducing transaction costs was a recurring theme in smallholder dairy development in East Africa. When effectively managed, such organizations reduce transaction costs for both the producers and buyers of dairy products. This reduction in costs typically is due to economies of scale in collection and transport, and also because organizations reduce the need for information about widely dispersed and small-scale buyers and sellers. Therefore, research on household and sub-sector models that better integrate both existing transaction costs, but also the institutions and contracts that govern individual transactions, would be beneficial in a broader sense (Staal *et al.*,1996).

Evidence of declining transaction costs were also observed by Ensminger (1992) among the Orma people of eastern Kenya. Trade increased as transaction costs of trade declined, thus affording better terms of trade, in part as a consequence of the spread of common institutional structures among both the Orma and their trading partners. The new institutions took the form of both conversion to Islam and state-imposed institutions such as courts, regulated weights and

measures, improvements in roads and telecommunications, and improved security (Ensminger,1992)

Coulter (1994) examined the liberalization process in marketing cereals in sub-Saharan Africa and observed the following constraints: inadequate roads and vehicles, lack of availability of trade credit and storage for chemicals, lack of market information, unsupportive legal frameworks and unwillingness of influential sections (i.e. politicians, elite) to formally support market liberalization.

Matoussi and Nugent (1989) used the transaction cost approach to explain the switch to sharecropping from wage and fixed rent contracts in a very fertile region of Tunisia. Using a logit model, they concluded that factors such as out-migration of family supervisors, the increase in irrigation and the rise in relative cost of labour were responsible for the switch.

A notable feature of nearly all developing countries is that most agricultural households produce a significant portion of the staple food that they consume. This is the case for a wide cross-section of geographical locations, levels of technological advancement, and land tenure arrangements (Renkow,1990). How these semi-subsistence households allocate output of staple foods between home consumption and market sales is an issue that has received considerable attention from economists because of its important implications for aggregate market supply, food disappearance patterns, and the nutritional consequences for rural and urban dwellers (Renkow,1990).

Renkow (1990) analysed the decision-making patterns of a group of Indian households and concluded that two factors may motivate semi-subsistence households to hold inventories of

staple foods. First, households might want to minimize their reliance on local markets for the satisfaction of basic food needs, holding stocks of food as a guarantee against unanticipated supply disruptions. Second, inventories of home-produced staples might result from profit-seeking behaviour in response to seasonal price movements for a particular storable commodity.

Clough (1999) investigated grain trade in northern Nigeria in the context of the social relations of production and exchange. Many households involved in trading justified their practices and actions in religious and moral terms. All commercial credit was interest-free because of social claims from friends, kin and other relationships. Economic change is channeled by religious belief and cultural value. He especially pointed out that the rural Hausa pattern of accumulation may be called "the pursuit of material ends through the extension of personal bonds".

In order to deal with the costs of exchange or trade, different mechanisms or framework have been initiated throughout developing nations. Runge (1986) indicates that limitations due to distance, assets and information gap can make a necessity of joint use rights (i.e. co-operatives) that elsewhere might seem unprofitable or unlikely. In particular, the transaction costs of well-defined and enforced private property rights typical in developed countries may simply be too great for a subsistence economy to bear.

Agroindustrialization, through its multiple facets is also looked at as both an agent of and a response to globalization and induced institutional and technological change. Reardon and Barret (2000) suggest that the decline in some agricultural commodities can be offset by stimulating value-added activities (i.e. agroindustrialization) that build on production agriculture. This is, they contend, a necessary condition for improving living standards among resource-limited populations

in developing nations. Rapid technological change brought about by agroindustrialization processes ultimately will transform the conduct and structure of production and trade in all sectors, stimulating productivity and allowing customized production and marketing processes at lower transaction costs (Reardon and Barret, 2000).

In the province of KwaZulu-Natal, no study has so far investigated the direct impact of transaction cost variables on participation in output markets and the resulting level of income generated. Most studies have assessed the institutional framework under which rural households operate (Barnes and Morris, 1997; Lyne, 1996), and input constraints which prevent efficient small-scale farmers from emerging in the province (Kuhn, *et al.* 2000; Matungul,2000; Fenwick, 1998; Fenwick and Lyne, 1998; Thomson, 1996).

In light of the institutional framework of rural KwaZulu-Natal, Barnes and Morris' (1997) assessment, although not formally referred to, indirectly reflect the transaction cost approach by pointing out that KwaZulu-Natal's rural institutional environment was poorly structured (largely for historical reasons). Unless changes were made, the enormous development problems already common among marginalized rural communities would only become worse. The same conclusion was arrived at a year earlier by Lyne (1996) who indicated that the inadequacy of rural infrastructure and legal uncertainty in the former KwaZulu homeland were two of the major sources of high transaction costs. Many former homelands in South Africa have dual legal systems (national law and tribal courts), which could be a source of confusion.

With respect to liquidity constraints and sources of credit, Kuhn *et al.* (2000) assessed three financial institutions operating in KwaZulu-Natal and concluded that expanding branch networks,

to cover emerging farmers, and better rural infrastructure would reduce client transaction costs. They contend that the provision of both savings and loan services to targeted emerging farmers and entrepreneurs would reduce borrower access costs, thus allowing savings to be used as a form of collateral.

In addition, Fenwick (1998) examined the impact of liquidity constraints relative to other constraints inhibiting small-scale farming in KwaZulu-Natal and concluded that liquidity was very important, while imperfect land markets, information, and high transaction costs were also significant inhibiting factors. Furthermore, Fenwick and Lyne (1998) used an index from variables assumed to reflect the level of transaction costs, including gender and age of the household head, length of residency, number of migrant workers, district dummy and ownership of a car to identify and rank the determinants of internal and external credit rationing in rural households. The results indicated that high transaction costs faced by sample households limit their access to formal credit markets.

As for land use in the communal areas of KwaZulu-Natal, Thomson (1996) used discriminant analysis to separate lessors and lessees for land in communal areas of rural KwaZulu-Natal and concluded that land rental markets were constrained because property rights to arable land were insecure and transaction costs were high. These problems, he argued, came from two sources: the user did not have exclusive rights to arable land, and the risk of losing land as a result of rental transactions was too high. After Thomson (1996) had initiated adaptive strategies to improve tenure security in the area, a reduction in transaction costs and risk in the rental market resulted. However, more needs to be done, and he recommends that the government could and should help to ensure that local precedents and national laws reinforce a household's security of tenure.

Better district roads and taxi services in the Impendle and Swayimana communal regions of KwaZulu-Natal have made it easier for residents to buy foodstuffs in nearby towns. Transaction costs for these households were lower by going to nearby towns than moving around their respective areas in search of foodstuffs (Matungul,2000).

In the rest of South Africa, Makhura (2001) investigated the role of transaction costs in determining market participation of small-scale farmers in the Northern province and revealed that access to assets (i.e. sizeable arable land, livestock, maize sales, non-farm income) and market information (i.e. contact with extension officers, proximity to markets), together with some household characteristics (i.e. household size, gender and age of head) were the major determinants of market participation. Previously, Mathye *et al.* (2000) used the transaction cost approach to explain market participation of smallholders in the Northern Province. Their study found that banana and mangoe producers who sold their products used different formal and informal channels, such as fresh produce markets and direct sales to consumers through roadside markets. Market participation was significantly influenced by transport problems, access to market outlets, and education and awareness of various marketing opportunities. Also, Makhura (1994) determined that access to agricultural information, the use of formal marketing channels and information management were distinguishing factors between farmers groups in the former Kangwane area of Mpumalanga. Another transaction cost study was initiated by Karaan (1999) who analysed transaction costs associated with mussel mariculture in Saldhana Bay. The study compared four models and concluded that agricultural franchising was the most suitable form of enterprise in dealing with high transaction costs.

In sum, the basic premise of agricultural market reform is that improving the incentive structure for small farmers (i.e. well functioning markets and higher product prices) will generate a positive supply response, increasing both agricultural output and income levels. Nonprice factors, including the condition of physical infrastructure (i.e. roads, communication networks), the availability of marketing services, modern inputs and credit in rural areas, and government support in the form of research and extension services have had a more profound impact on aggregate agricultural output than prices (Kherallah *et al.* 2000)

The preceding review of literature has provided a clearer pattern of factors responsible for transaction costs. Market participation is influenced by fixed transaction costs, while its level and the output sold are primarily determined by both variable and fixed transaction costs. Transaction costs facing smallholder farmers are generally unobservable but do inhibit possible participation in market exchanges, that is, when the costs of exchange are higher than the value or utility derived from a transaction, farmers will not participate in the market. Transaction costs result from differential access to assets and information. There is consensus however that the presence of transaction costs will affect the pattern and the level of participation in the market which ultimately determine the level of income derived. Transaction costs include costs resulting from distance to markets, poor infrastructure, high marketing margins, imperfect information, supervision and incentive costs. Distance to markets, together with the poor infrastructure, poor access to assets and information lead to high exchange costs.

Given the nature of these costs (i.e. unobservable), the concept of transaction costs in various empirical analyses has been captured by defining a range of variables. The first set of variables represent access to assets. They include the size of allocated arable land, livestock ownership,

transport assets and liquidity. The second group indicate access to information, such as distance and condition of the roads to market centres and direct access to market information. The rest of the variables reflect socio-economic characteristic of the household. Access to market information, assets and market outlets, combined with improved physical (i.e. roads & telecommunications) and institutional (i.e. legal right, contract enforcement) infrastructure could significantly lower transaction costs, thus, stimulate market participation and income.

With this overview of the literature on the New Institutional Economics and Transaction Cost Economics, the following chapter deals with the research sites and data collection procedures. This will be followed with an analysis of the socio-economic characteristics of the sample households.

CHAPTER 3

RESEARCH SITES AND DATA COLLECTION

In this chapter a description of the two study areas and the methods used to collect survey data and field operations are presented. The study areas, namely the Impendle and Swayimana regions in KwaZulu-Natal, represent two distinct bioclimatic regions of KwaZulu-Natal and have different levels of agricultural potential. Multi-stage sampling techniques were used to collect data. Impendle and Swayimana each constituted a stratum from which a number of primary-stage-units (PSU's) were selected. Household activities, characteristics and socio-economic data were recorded in a predesigned questionnaire through interviews. Interviews in Swayimana were conducted during January and February 1999, while the survey in Impendle was conducted in April and May 1999. Figure 3.1 shows the location of Impendle and Swayimana regions of KwaZulu-Natal.

3.1 DESCRIPTION OF THE STUDY AREAS

3.1.1 Impendle

Located southwest of the provincial city of Pietermaritzburg, Impendle covers more than ten subwards and is approximately 85 km from downtown Pietermaritzburg. Impendle falls under bioclimatic region 4, which extends seawards from the foothills of the Drakensberg at an elevation of between 1400-1950 metres above sea level (Phillips,1973). Winters are cold and frosts are severe to very severe (Van Heerden,1974). Early spring winds are a hazard as they are usually very hot. Annual rainfall varies between 800-1500 mm, with an average of 920 mm. Mean annual temperatures vary between 13 and 15°C. During the winter months snow is a common phenomenon. Vleis are more

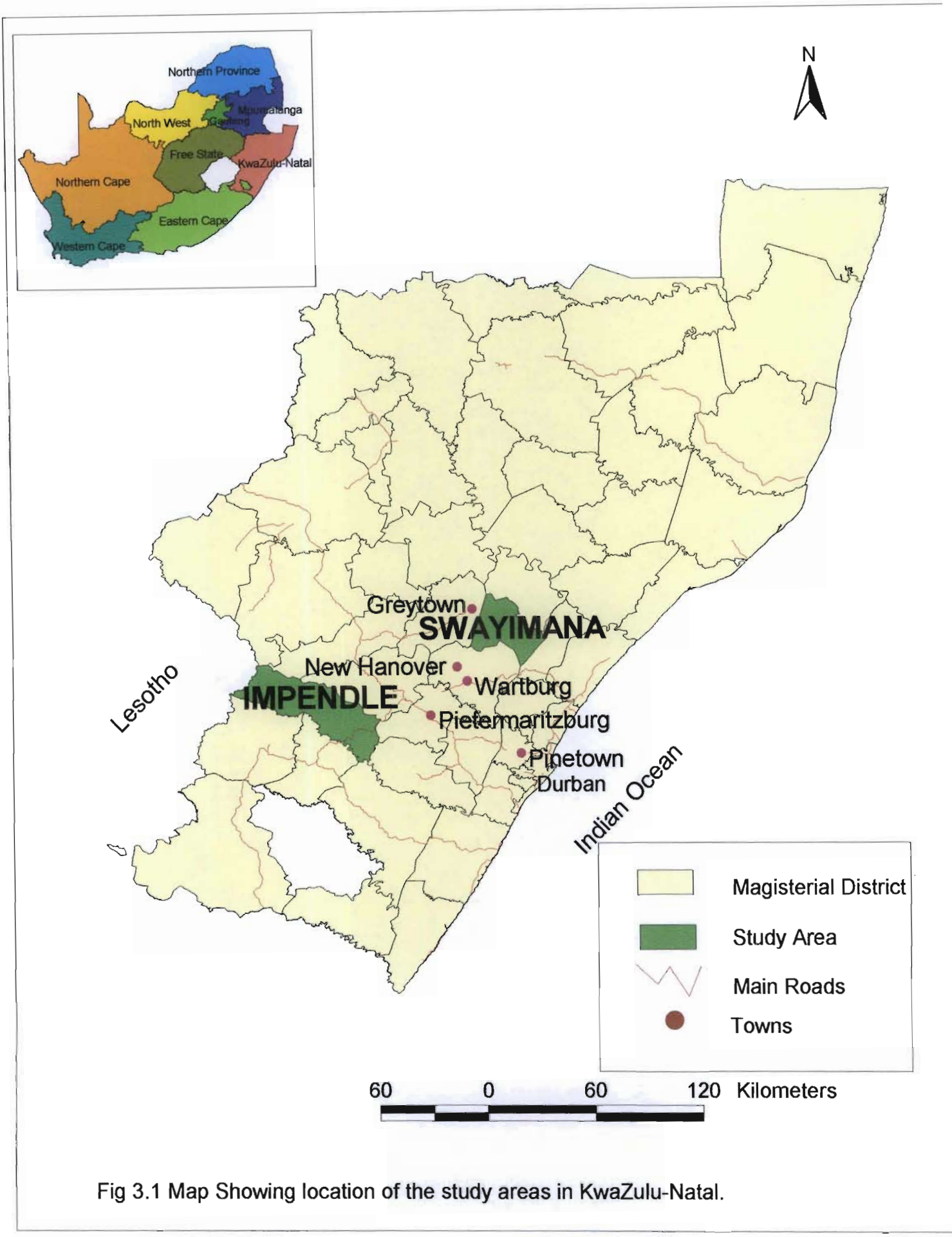

Fig 3.1 Map Showing location of the study areas in KwaZulu-Natal.

frequent than in the Mistbelt region and occupy up to eight percent of the landscape. The Impendle region has agricultural potential but is mostly suited to animal husbandry. Crop production includes cultivation of potatoes, maize and vegetables; however, soil acidity is a major obstacle to agricultural production.

Impendle is easily accessible by tar roads (district roads). Taxi services regularly commute from the area to nearby towns (Pietermaritzburg, Howick) and vice-versa. The area's proximity to Pietermaritzburg provide farmers with an important market outlet for agricultural products. Yet, the poor state of secondary (gravel) roads within the area does not always make transport easy, especially in rainy conditions and at night.

3.1.2 Swayimana

Swayimana lies at an elevation of between 800 and 1000 metres with a gentle terrain. It falls into Phillip's (1973) bioclimatic region 3 (Mistbelt) and is well supplied with water (Stewart, 1986). The weather is cool and moist with annual precipitation exceeding 1000mm. Mean annual temperatures vary between 16 and18°C. The region is well suited to cropping, forestry and intensive livestock production. The entire area is 7500 ha in extent and the centre is approximately 65 km from the provincial city of Pietermaritzburg. Swayimana farmers grow more crops and vegetables (potatoes, cabbage, madumbis, maize, etc.) than those in Impendle, where livestock tends to predominate.

The agricultural potential of these regions is high (Kars,1998) and maize, beans, potatoes and madumbi (in Swayimana) are important food and cash crops. Various vegetables, cabbage and

tomatoes are also grown. The two study areas are relatively well served by taxi's (passenger vans). A trip to Swayimana, for instance, takes about one hour from Pietermaritzburg. The two areas' proximity to Pietermaritzburg could provide farmers with an important market outlet for agricultural products. Indeed, many people who live in these areas commute to jobs in nearby towns (Pietermaritzburg, Wartburg, Howick, Pinetown, and Durban), sometimes on a daily basis. However, the poor state of secondary (gravel) roads within these areas makes travel difficult, especially at night and in rainy conditions.

3.2 SAMPLING TECHNIQUES AND SURVEY INSTRUMENTS

A multi-stage sampling procedure was used in the survey of rural households in each study area (stratum). The goal in designing surveys is to maximize the information obtained for a fixed expenditure. Samples displaying small variability among measurements will produce small bounds on the errors of estimation. Thus, if all households in one stratum tend to think alike on marketing issues, accurate estimates of those perceptions can be obtained with a relatively small sample (Lyne, 1981). Within each study area, residents share the same culture, institutions (formal and informal) and almost the same agronomic environment. It follows that households within these areas should exhibit similar marketing behaviour and low variability in crops produced.

3.2.1 The multi-stage concept

The initial step consisted in obtaining permission from the tribal authorities to conduct research in the regions. The boundaries of each study area were then defined. Multi-stage techniques constitute an important part of advanced sampling theory and involves the following steps (Lyne, 1981):

Step1: Define the survey area.

Step2: Divide the survey area into unique primary-stage units (PSU's).

Step3: Group the PSU's into strata.

Step4: Select random PSU's from each stratum

Step5: List the second-stage units (SSU's or farm homesteads) in each sample PSU.

Step6: Select random SSU's from each sample PSU.

Latt (1987) summarized the procedure as follows:

a) A survey region is selected and divided into a number of non-overlapping primary sampling units (PSU's). Homogeneous PSU's may be further grouped into strata in order to improve the sample precision. b) At the first stage, a sample of PSU's is drawn using a suitable method (in this case, with probability proportionate to size). c) A list is made of all the secondary sampling units (SSU's) in each selected PSU. d) A sample is then drawn of the SSU's in each of the selected PSU's and relevant data collected. Third-stage units may be identified if required.

3.2.1.1 Impendle

A total of 120 households were sampled in each stratum. Impendle was divided into nine primary-stage units (PSU's), of which five were selected with probability proportionate to size (Kothari, 1990:78). Where possible, roads and other landmarks were used to define PSU boundaries. Since exact figures about the total population within each unit were not available, estimates of PSU size were based on household counts taken from orthophoto maps.

Table 3.1 lists the PSU's and indicates the number of households sampled in each of the selected

PSU's. The overall sampling rate in this stratum was almost 4%.

Table 3.1 Estimated size of primary-stage units in Impendle, KwaZulu-Natal, 1999

PSU	Households	Range	Probability	Selected	Sample size
Inguga	400	1 - 400	0.12638		
Mgodi	430	401 - 830	0.13586	Yes	19
Inzinga	425	831 - 1255	0.13428		
Smilo Bar	460	1256 - 1715	0.14534	Yes	32
Maxam	280	1716 - 1995	0.08847	Yes	16
Come&See	180	1996 - 2175	0.05687		
Kheta	300	2176 - 2475	0.09479		
Gomane	500	2476 - 2975	0.15798	Yes	35
Nhlabankosi	190	2976 - 3165	0.06003	Yes	18

3.2.1.2 Swayimana

The same approach was used to select PSU's and households in Swayimana. This stratum was divided into 11 PSU's of which five were selected. Table 3.2 shows that a sampling rate of 12% was applied within each selected PSU yielding an overall sampling rate of roughly 5% in this stratum.

Table 3.2 Estimated size of primary-stage units in Swayimana, KwaZulu-Natal, 1998

PSU	Households	Range	Probability	Selected	Sample size
Mambedwini	131	1 - 131	0.05728	Yes	15
Ekupoleni	234	132 - 365	0.10232		
Ngololeni	116	366 - 481	0.05072	Yes	13
Okhasini	165	482 - 646	0.07215		
Elangeni	108	647 - 754	0.04722		
Msilili	300	755 - 1054	0.13118	Yes	35
Ndlaveleni	229	1055 - 1283	0.10013		
Odlameni	258	1284 - 1541	0.11281		
Nkululeko	242	1542 - 1783	0.10582	Yes	28
Etsheni	255	1784 - 2038	0.1115		
Emahlathini	249	2039 - 2287	0.10888	Yes	29

3.3 QUESTIONNAIRE

The survey instrument recorded in detail all household activities (farm and non-farm), livestock numbers, inputs used, expenditures and sales for the 1997/98 season. The questionnaire also captured socio-economic data such as household characteristics, land size and property rights, farm characteristics, investment in capital equipment and assets, savings activity and participation in markets and farmers' institutions. Other questions explored farmers' perceptions of market constraints, information sources, management capacity, access to physical and institutional infrastructure, and demographic characteristics.

The interviews elicited farmers' perceptions of existing marketing channels and whether or not they would like to see changes in these institutions. Information variables covered the importance of extension services and other institutions (farmers' associations) as sources of market information. Management capacity and the ability to assume risk were measured by the number of farm enterprises and the ratio of net worth to assets. A broader portfolio of farm enterprises and a higher ratio of net worth to assets usually indicates greater managerial ability (Fu, *et al.*, 1988). Demographic factors included the supply of on-farm family labour, dependency ratio and educational status. Farmers literate in English are expected to have better access to information or innovations, thus reducing the subjective probability of failure in marketing their products. Other factors considered the presence of physical infrastructure (market place, banks, roads and telecommunication) and institutions that influence farming and marketing decisions (legal system and contract enforcement). A copy of the questionnaire used is presented in Appendix 1.

Enumerators were employed in each stratum and trained to apply the survey instrument. Four female matriculants fluent in both Zulu and English in each study area were trained and appointed to assist in the survey. A pilot survey was conducted to check the performance of enumerators and the validity of some questions. Informal interviews with key informants supplemented the survey information. Agricultural extension officers, school principals, teachers, farmers' representatives, and members of the tribal authority (Nkosi and Indunas) provided useful background information about agriculture and certain programmes affecting local farmers.

3.4 FIELD OPERATIONS

After meeting with the Director of the Southwest Region of KwaZulu-Natal in Hilton, the author was introduced to the agricultural district officers of both Umvoti (Swayimana) and Hlanganani (Impendle). These officers in turn organized meetings with local leaders during which four female matriculants in each study area were chosen for the survey. Matriculants were required to be fluent in both English and Zulu. Prior to the main survey, a week was set aside for the training of the selected matriculants. The training consisted of understanding the questionnaire (Appendix 1) and interpreting it. This opportunity was also used to explain the objectives of the study and its relevance. Different Indunas (headmen) and extension officers were used to introduce the team to the respondents and explain the aim of the survey. Extension officers were also used in the listing and identification of households from selected primary-stage units.

During the survey, where possible, the size of allocated arable land was measured by the team with a metre-wheel. After each interview, a check was made on the questionnaire to ensure that all questions were correctly interpreted and that questionnaires had been correctly completed. The next chapter presents the socio-economic characteristics of the sample households.

CHAPTER 4

SOCIO-ECONOMIC CHARACTERISTICS OF THE SAMPLE HOUSEHOLDS

The objective of this chapter is to provide a context in which to understand and draw implications about the potential of and interests in physical and institutional infrastructure improvement in the two study areas. Household characteristics within the study areas, where marketing constraints are being evaluated, are important in order to understand the magnitudes of these constraints. It is also imperative to assess the extent to which support systems currently in place respond adequately to the needs of communal farmers. To get a broader picture of the environment in which these farmers operate, it is important to analyse the demographic information, availability and accessibility of extension services, the land tenure systems, marketing channels used and other related issues. There are major socio-economic constraints on production and marketing potential in the two study areas, although the extent or conditions vary between and within the districts.

4.1 HOUSEHOLD CHARACTERISTICS

Some selected variables in this study have skewed distributions and therefore both their mean and median will be used to summarise the information. The median is a more representative criterion than the mean in data sets with skewed distributions (Steyn *et al.*, 1995). The descriptive statistics presented in this chapter were computed as if a simple random sample of households had been drawn from each stratum. This approach introduces some bias into the sample estimates unless the primary-stage units (PSUs) are of equal size within each stratum. The median and mean characteristics of household heads are summarised in Table 4.1.

Differences between strata were tested using the Mann-Whitney statistic (Steyn *et al.*, 1995, cited by Nell *et al.*,1999) for the medians and *t* test for the means.

The population structure in rural KwaZulu-Natal is generally female inclined, with women constituting 54% of people in the economically active age group (Marcus, 1995). However, within the two study areas, 64% of sample household heads were males and 36% females. Female-headed households made up 33% of the total sample in Impendle and 39% of the sample in Swayimana. The mean age of the household head in Impendle was 57.9 years with a median of 59 years, while Swayimana household heads had an average age of 59 years with a median of 60 years.

Table 4.1 Median and Mean characteristics of the sample farmers in Impendle and Swayimana, KwaZulu-Natal, 1999

CHARACTERISTICS	IMPENDLE (n= 120)		SWAYIMANA (n= 100)		W(U) Pvalue[1]	t-values
	Median	Mean	Median	Mean		
Age of household head (years)	59	58	60	59	0.375	0.73
Family size (members)	6	6.2	7	7.1	.002***	3.22***
Education level (formal years)	5	5	5	6	0.14	1.84*
Management skills (number of enterprises)	4	4.2	6	6	.000***	7.67***
Residence in the area (years)	24	25.4	29.5	38	.000***	4.62***
Land size (hectares)	1	1.1	1.5	2	.000***	4.59***
Livestock income (R/ year)	114	1943	0	265	.000***	3.81***
Off-farm income (per year)	500	536	1000	576	.000***	0.18
Crop income (per year)	725	1183	1200	1698	.000***	2.34**
Distance to public phone (kilometres)	2	3	3	5	.001***	3.40***

[1] Mann-Whitney test

***, **, * Significant at the one, five and ten percent levels of probability, respectively.

The ability to conduct business beyond the communal areas was assessed in terms of the household head's formal years of education and his or her knowledge of the English language. The proportion of households with a literate head is quite low at 28% in Impendle and 38% in Swayimana. Overall, 59% of household heads could not speak and write English. The median formal years of education was similar in Impendle and Swayimana (five years). The implicit consequence of this situation is that most farmers would face high transaction costs in marketing their products outside of the study areas.

With a mean monthly household income of R788 and a mean monthly per capita income of R126 in the rural areas, the province of KwaZulu-Natal has the third highest incidence of poverty in the country and approximately 60% of the population lives below the Household Subsistence Level (May, 1995). Wage employment in nearby towns and local commercial agriculture constitute the main sources of income in rural KwaZulu-Natal. These sources are supplemented by remittances, income from entrepreneurial activities and welfare transfers (pension payments). In the two study areas the pattern of income sources is similar, although there are variations in the order of importance of various sources. Household off-farm incomes are low and the results show that income distribution is heavily skewed towards lower income levels with a median monthly off-farm income of R500 and R1000, and a median crop income of R725 and R1200 for Impendle and Swayimana, respectively.

4.2 LAND TENURE AND RIGHTS

The land tenure system which prevails in the study areas is an adaptation of the tribal system of land allocation (Lenta, 1981). Land is not held as "private property" with exclusive rights vested

in individual or juristic persons. Instead, the tribal authority allocates land to residents according to customary rules. Once allocated, families may endow individual members with right of usufruct, but neither the individual nor his/her family owns the land outright. Land which is not used by the household for residential purposes or crops becomes communal grazing. In winter, after the harvest, the cropland is also opened for communal grazing. About 48% of sample households in Impendle have less than one hectare of arable land, whereas in Swayimana about 52% have between one and two hectares (Table 4.2).

Table 4.2 Distribution of arable land by sample households in Impendle and Swayimana, 1999

	IMPENDLE (n =117)		SWAYIMANA (n =120)	
Size of arable land (in hectares)	n	%	n	%
< 1 ha	56	47.9	24	20
1 - 2 ha	45	38.5	62	51.7
2.1 - 5 ha	16	13.7	33	27.5
> 5 ha	0	0	1	0.8
Total	117		120	

There was no official explanation for the range in land sizes in both study areas. However, informal interviews pointed to the arbitrary way in which land is allocated by the tribal authority as the main reason for this disparity. Allocated land size depended not only on the availability of land, but mainly on the household's status or acquaintance in the community. According to custom, every household has the right to a plot of (arable) land. However, some households do not use all of their allocated land for agricultural activities, but keep it for "social security" reasons. While some land was left fallow, 75% of all respondents in Swayimana and 89% in

Impendle claimed to have cultivated their entire arable allotment. Reasons offered for not cultivating the entire area revolved around capital and labour constraints.

Only 10% of farmers in Impendle were able to access the extra land they needed, compared to 16% in Swayimana despite the absence of rules preventing neighbours from leasing out unused arable land. Informal discussions suggested that many households were unwilling to participate in rental transactions for fear that they may lose permanent rights to the land. The absence of an efficient rental market for arable land is undermining efficient land use. Thomson (1996) concluded that rental markets are constrained because property rights to land are insecure and transaction costs high. While respondents in this study were not concerned about being dispossessed as a result of leasing land out, it is possible (as in Thomson's study) that prospective tenants faced uncertainty in enforcing rental contracts in tribal courts. Despite the absence of a rental market for land, 53% of households sampled in Swayimana claimed to have bought their land. This could not be confirmed as no one was able to produce a legal title for the land acquired.

4.3 INPUT PURCHASES

The productivity of small-scale farmers cannot be successfully increased without an effective marketing system for their products and inputs (Harper and Kavura,1982). The lack of capital to hire oxen or a tractor and to purchase seeds and fertilizers, and also the unavailability of these inputs in their areas, were widely expressed by respondents as the main constraint to their farming activities. Table 4.3 summarises the type of inputs acquired by sample households.

Table 4.3 Type of inputs purchased by sample households in Impendle and Swayimana, KwaZulu-Natal, 1997/98.

INPUTS	IMPENDLE (n=120)		SWAYIMANA (n=120)	
	n	%	n	%
Manure	41	34	60	50
Fertilisers	100	83	119	99
Lime	60	50	0	0
Seeds	115	96	62	52
Hired ploughing service	103	86	108	90
Hired animal draught service	48	40	30	25
Hired transport service	26	22	0	0
Hired labour	24	20	43	36
Chemicals	23	19	12	10
Mean farm expenses (R)	783.01		1199.43	

The majority of households in both study areas purchased fertilisers and seeds, and hired ploughing services.

4.4 MARKETING AND CROP INCOME

4.4.1 Marketing channels and marketed crops

All households sampled in Impendle produced surpluses intended for the market, whereas 20 households (17%) in Swayimana did not sell any product. Isolation from the main roads and poor conditions of secondary roads render marketing activities very difficult for farmers and private traders (e.g. hawkers). Informal marketing channels such as neighbours, local shops and pension

markets were widely used by farmers in both regions with the majority of respondents (98% in Impendle and 56% in Swayimana) selling their products to neighbours. About 29% of respondents in Swayimana sold to hawkers compared to 33% in Impendle. The limited number of private traders venturing into these areas means that some farmers do not have access to more formal markets. Table 4.4 lists marketed agricultural products in both study areas. The two main crops produced and sold are potatoes in Impendle and madumbis (a root crop) in Swayimana. Potatoes were produced and sold by 73% of the sample households in Impendle, compared to 86% of respondents in Swayimana who sold madumbis. Local or regional stakeholders should consider ways of developing market outlets for these crops through appropriate institutions. Advertising methods employed by respondents revolved around the use of word-of-mouth, notice boards and roadside displays, and they based their prices on those of local competitors.

Table 4.4 Marketed agricultural products and generated mean income of surplus-producing sample households in Impendle and Swayimana, KwaZulu-Natal, 1997/98.

	IMPENDLE (n = 120)			SWAYIMANA (n = 100)*		
CROP	**n**	**%**	**Mean Income (R)**	**n**	**%**	**Mean Income (R)**
Maize (green)	7	5.8	16.79	26	26	102.08
Maize (grain)	29	24.2	176.75	27	27	92.45
Madumbis	1	0.83	1.25	86	86	461.33
Potato	87	72.5	424.45	63	63	257.83
Sweet potatoes	1	0.83	1.66	60	60	236.55
Dry beans	56	46.7	304.91	52	52	199.25
Green vegetables	89	74.2	290.08	13	13	67.37
Mean farm size (ha)	1.1			1.8		
Mean number of farm enterprises	4.2			5.8		
Gross crop income (**R**)	1182.58			1415.75		

* Twenty households did not sell any crops in Swayimana.

4.4.2 Expenditures and crop income

Table 4.5 provides mean expenditures on inputs and mean incomes from the sale of agricultural products in Impendle and Swayimana. Households in Impendle spent on average R783 on inputs compared to R1199 in Swayimana. This difference may be due to a greater focus on livestock in Impendle, with lower costs involved in tending livestock. On average, potatoes provided the highest income in Impendle (R424) and madumbis (R461) in Swayimana.

Table 4.5 Expenditures and incomes (Rand) of marketed produce by surplus-producing sample households in Impendle and Swayimana, KwaZulu-Natal, 1997/98

ITEMS (in Rand)	**IMPENDLE (n=120)**		**SWAYIMANA (n=100)**	
	range (R)	**mean** (R)	**range** (R)	**mean** (R)
Expenditure on farm inputs	50 - 3805	783	80 - 7437	1199
Total sales (crops + livestock)	100 - 34100	3155	0 - 27180	2518
Non-farm income (wages, remittances, etc.)	0 - 6000	536	0 - 16450	576
Income from selling crops	80 - 1151	1183	0 - 9325	1416
Livestock sales	0 - 33400	1943	0 - 7200	265
Madumbis	0 - 150	1.25	0 - 2500	461*
Maize (green)	0 - 500	17	0 - 1200	102
Maize (grain)	0 - 4000	177	0 - 2500	92
Potatoes	0 - 7500	424*	0 - 4000	258
Dry beans	0 - 4780	305	0 - 1500	199
Sweet potatoes	0 - 200	2	0 - 2500	237
Green vegetables & others	0 - 2600	290	0 - 2000	67

*Shows the highest crop income per household

4.5 CREDIT USE AND SOURCES

Only two farmers (one in each study area) used credit for the purchase of fertilizers. Owing to the importance of collateral to the functioning of credit markets, the absence of well-defined and enforced private property rights in land may effectively prohibit the successful operation of formal credit markets in rural areas (Feder and Feeny, 1991).The absence of formal credit institutions within the two settlements might explain the lack of credit use. A question was asked to assess whether sample farmers would consider borrowing capital to expand their farming activities if formal credit institutions were within acceptable distances. Almost all farmers knew about borrowing and would consider this option. However, as shown in Figure 4.1, their preferred sources of credit differed considerably and favoured informal sources of lending rather than formal sources, such as banks and government lending institutions (e.g. Ithala). Neighbours, relatives and friends were the most mentioned and preferred sources of credit by sample household heads in

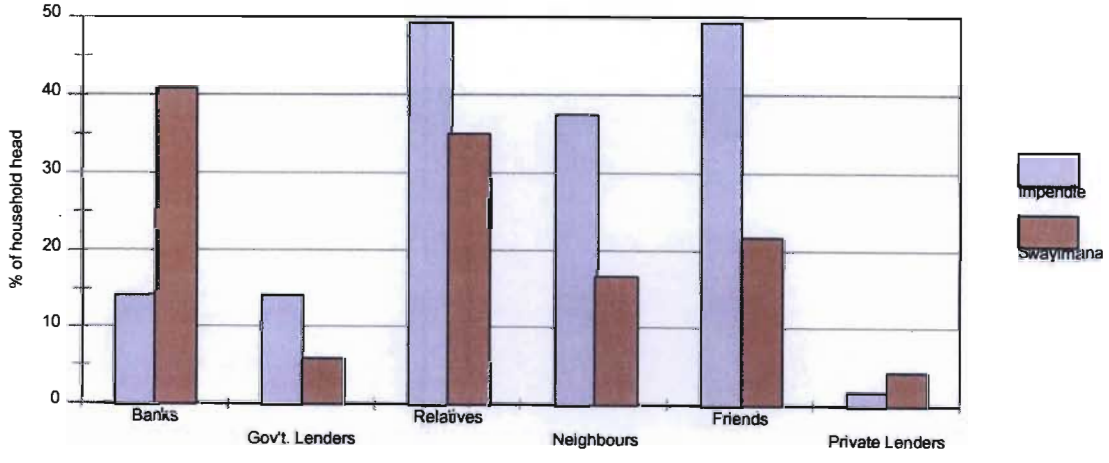

Figure 4 1. Preferred source of credit by household heads sampled in Impendle and Swayimana, KwaZulu-Natal, 1999.

Impendle, while in Swayimana over 40% of respondents would prefer formal banks. These findings suggest that borrowers face much lower transaction costs in local, informal credit markets. Recently, however, formal schemes (i.e. credit co-operatives) initiated to extend loans to some communal farmers in KwaZulu-Natal have proven unsuccessful (Ferrer, 2001). The 100% level of saving imposed in order to secure an individual loan has been the main deterrent factor for many communal farmers. It might therefore be beneficial for both formal (e.g. Ithala, credit co-operatives) and informal (i.e. stockvel) lenders to strengthen their ties with one another and proceed with group lending schemes. Group lending reduces the problem of moral hazard as members know each other and can monitor each other's behaviour (Meyer, *et al.*,1992).

4.6 MARKETING CONSTRAINTS

Obstacles such as limited market outlets, poor roads and transport were often mentioned as the main challenges to the respondents' marketing activities. This situation is further exacerbated by the fact that many farmers produce the same products, thus increasing competition. Alleviating the perceived marketing challenges listed in Table 4.6 through "grass-roots" initiatives could boost commercial agriculture within these communal areas. Access to market outlets appears to be more limiting than does transport suggesting that factors such as poor marketing skills and information, and the inability to communicate and contract may be the underlying problems.

Table 4.6 Marketing problems mentioned by sample household heads in Impendle and Swayimana, 1999

	IMPENDLE (n = 120)		SWAYIMANA (n = 100)	
Problem	**n**	**%**	**n**	**%**
Market outlets	74	61.7	4	4
Competition	20	16.7	7	7
Transport	18	15	22	22
Payment collection	14	11.7	24	24
Bad roads	12	10	1	1

4.7 EXTENSION SERVICES AND FARMERS' TRAINING NEEDS

4.7.1 Extension services

Visits by extension officers and membership of farmers' associations were expected to be the most important sources of market information for sample farmers. Extension services provide farmers with information on technology and other aspects of agriculture that can increase their production and income (Martin and Taylor, 1995). Table 4.7 shows an assessment of extension contacts in the study areas in terms of household heads knowing the extension officers operating in their area and in terms of visits received.

Table 4.7 Extension services and information sources, household heads in Impendle and Swayimana, KwaZulu-Natal, 1997/98

Characteristics	IMPENDLE (n =120)		SWAYIMANA (N =120)	
	n	%	n	%
Visited by extension officer	53	44.2	29	24.1
Visited the extension officer	44	36.7	24	20
Knew extension officer's name	69	57.5	56	46.7
Knew name, but no contact	15	12.5	27	22.5
Member of farmers' association	41	34.2	7	5.8
Cooperate with commercial farmers	23	19.2	26	21.6
Would cooperate with com. farmers	100	83.3	115	95.8
Attended agricultural training	30	25	15	12.5

Access to extension services was determined by asking if the household head or anyone else in the household had been visited by a government extension officer during the 1997/98 farming season. In Impendle, about 44% of the household heads interviewed indicated that they or a household member had face-to-face contact with, or were visited by, a government extension officer, compared to only 24% of household heads in Swayimana. On average, sample households in both study areas received one visit per year from an extension officer. Household heads were also asked if they had attended meetings and agricultural training organised at a local centre, whether they knew the extension officer serving in their area and whether they had cooperated with nearby commercial farmers. About 58% of household heads in Impendle knew the name of their extension officer compared to 47% in Swayimana. Only 25% and 13% of household heads, respectively, attended any agricultural training organized in their areas. The lack of information is evidenced by an overwhelming percentage of household heads willing to cooperate with large-scale commercial farmers to gain any kind of agricultural expertise.

Chi-square analysis was conducted to determine if there was differential access to extension services based on household head characteristics and the size of allocated arable land. The results reveal that there were no significant differences in terms of access to extension with respect to the age, gender and years of formal education of respondents.

Table 4.8 Distribution of extension visits and membership of farmers' associations with respect to allocated arable land in Swayimana, 1999

Land size	Household head had visit from extension officer Yes (n =30)	 No (n = 90)	Household head is member of farmers' association Yes (n =7)	 No (n =113)
≤ **2 ha** (n = 86)	53.3 %	77.8 %	42.9 %	73.4 %
>**2 ha** (n = 34)	46.7 %	22.2 %	57.1 %	26.6 %
	$\chi^2 = 6.621$ df =1 p = 0.010		$\chi^2 = 3.038$ df = 1 p = 0.081	

With respect to the size of allocated arable land, the incidence of sample households visited by an extension officer is higher for those with smaller farms (Table 4.8). More contact is afforded to farmers with less than two hectares of arable land (these are probably members of community gardens). The data in Table 4.8 also suggest that membership of farmers' associations in Swayimana was significantly associated with the size of allocated arable land. The majority of household heads who operate more than two hectares are members of farmers' associations. In Impendle, however, this relationship was not significant. About 20% of respondents in both Impendle and Swayimana resolved the lack of extension services by cooperating at different levels with nearby commercial farmers.

4.7.2 Major training needs

It is evident from the previous section that the extension services can and should play an important role in satisfying the training needs expressed by respondents in Table 4.9.

Table 4.9 Training needs expressed in order of importance in Impendle and Swayimana, 1999

IMPENDLE (n =120)		SWAYIMANA (n =100)	
1. Marketing skills	68.3%	1. Soil conservation	76.6%
2. Planning of production	51.6%	2. Marketing skills	37.5%
3. Soil conservation	42.5%	3. Livestock & poultry	31.6%
4. Farm budgeting	14.1%	4. Farm budgeting	18.3%
5.Livestock & poultry	12.5%	5. Planning of production	10.0%

In addition to the need for training skills, other requirements such as access to credit and market outlets were expressed. Their incidence is summarised in Table 4.10.

Table 4.10. Other important needs expressed by sample household heads in Impendle and Swayimana, KwaZulu-Natal, 1999.

Needs	IMPENDLE (n=120)		SWAYIMANA (n=120)	
	n	%	n	%
Improved roads	60	50	45	37.5
Credit/Loans	43	35.8	50	41.7
Market outlets	55	45.8	70	58.3
Tractor services	35	29.2	20	16.7
Seeds, fertilisers & fences	65	54.2	12	10
Banking facilities	8	6.7	55	45.8
More arable land	60	50	30	25
Advice on marketing crops	3	2.5	2	1.7
Strong laws against theft/stray cattle	5	4.2	0	0

Market outlets was the need most mentioned by sample household heads in Swayimana (58%), followed by banking facilities (46%) and credit (42%). In Impendle, besides the need to acquire inputs such as seeds and fertilisers (54%), improved roads (50%), access to more arable land (50%) and market outlets (46%) were mentioned as important conditions for increased output and sales.

4.8 BUYING PATTERNS FOR STAPLE FOODS

Better district roads and taxi services make it easier for rural residents of Impendle and Swayimana to shop in nearby towns (Pietermaritzburg, Wartburg, Howick, Pinetown). However, survey results in Table 4.11 indicate that an overwhelming number of these households still buy their staple foodstuffs from within their own areas. Even though only 38% of households in Impendle and 35% in Swayimana bought foodstuffs from their neighbours, 98% and 83% bought from local sellers. Swayimana has the largest percentage of its sample households (63%) buying staple foodstuffs in town, as opposed to only 46% in Impendle.

A large proportion of sample households in both areas expected a high quality of fresh staple foodstuffs from their neighbours (39% and 48%). Yet less than 40% bought staples from their neighbours. One explanation is that cash is saved in town for safety reasons and therefore shopping is done there. Another reason is that local supplies are highly seasonal and therefore not always available. Proximity and transport appear to influence buying decisions; distance and bus fares are negatively related to the proportion of households that shop for food staples in town.

Table 4.11 Factors and characteristics affecting the patterns of staple food purchases by sample rural households in Impendle and Swayimana, KwaZulu-Natal, 1999

	IMPENDLE (n=120)		SWAYIMANA(n=120)	
	n	%	n	%
Household head buying habits				
Buy within the area	118	98.3	100	83.3
Buy in town	55	45.8	75	62.5
Buy from commercial farmers	19	15.8	3	2.5
Buy from immediate neighbours	46	38.3	42	35
Household head expects high food quality				
In town	49	40.8	49	40.8
From neighbours	47	39.2	58	48.3
From commercial farmers	22	18.3	13	10.8
Others factors influencing household head buying habits				
Bank accounts in town	79	65.8	85	70.8
Own a car/bakkie	33	27.5	46	38.3
Distance to Pietermaritzburg	85 km		60 km	
Bus fare to Pietermaritzburg	R13		R8	

In sum, descriptive analysis of the sample survey data collected in the Impendle and Swayimana regions shows the extent to which emerging small-scale farm households have access to formal markets and other services such as agricultural extension, training and market information. Results indicate that the majority of the sample households sell their produce mainly through informal channels, e.g. neighbours. Sample households have difficulty marketing in towns due to poor physical and institutional infrastructure and weak socio-economic status. Poor roads and communication systems, transport, capital constraints, the absence of a rental market for land,

an uncertain legal system, low levels of education and limited knowledge of English amongst household heads, are major constraints to market development in the study areas. Extension services are confined to specific programmes and do not necessarily reflect the real needs of small farmers in the study areas. Major problems expressed by farmers were the lack of marketing facilities and skills, extension services and inadequate capital. Responsive local institutions which address high transaction costs and improve access to information and assets would facilitate markets and assist farmers in generating higher income from their activities.

CHAPTER 5

EMPIRICAL ANALYSIS AND RESULTS

5.1 DIMENSIONS OF TRANSACTION COSTS IN IMPENDLE AND SWAYIMANA.

The objective of this section is to explore the linkages between transaction cost factors and the marketing activities as observed in the study areas. Building on the New Institutional Economics' work of such authors as Delgado (1999) and North (1990), these factors are introduced and links are made with their impacts on marketing activities of sample households. Transaction costs are the resources required or involved in trade. These costs can be explicit as well as implicit (Chavas *et al.*,2000). Explicit transaction costs include transportation costs and implicit costs refer to the opportunity cost of time spent by farmers in gathering information, searching for new partners or new market outlets (i.e. traveling and waiting time). The implicit costs are the highest, suggesting that the proximity of institutions (marketplace, market outlets, etc) is of crucial importance (Gonzalez-vega, 1993). In short, transaction costs are the embodiment of barriers to market participation by resource-poor small-holders (Holloway *et al.*, 2000).

The legal status of a woman is not high in tribal areas. Gender and social standings have an influence on the outcomes of disputes, as exchanges in developing countries often occur in the context of personalized relationships. This elevates the risk in transactions and increases the transaction costs involved as opposed to formal and impersonal contracts (Berry,1993). Risk involved from the time gap before a transaction is completed also contributes to transaction costs. A much less risky environment and less risky clients or partners can be produced through improving the socio-economic environment of small-scale farmers. This can be realised through

better communication and transport and improved agricultural marketing and production skills through strengthening support services (Coetzee,1995). In their study of Mexican households, Key *et al.*, (2000) found that transaction costs play a significant role in explaining household behaviour.

5.1.1 Principal component analysis

Principal component analysis (PCA) is used to assess transaction cost dimensions in the study areas. The object of the analysis is to take p variables $X_1, X_2, \ldots X_p$ and find combinations of these to produce indices $Z_1, Z_2, \ldots Z_p$ that are uncorrelated. The lack of correlation is a useful property because it means that the indices are measuring different "dimensions" in the data. However, the indices are also ordered so that Z_1 displays the largest amount of variation, Z_2 displays the second largest amount of variation, and so on. That is, $var\ (Z_1) \geq var\ (Z_2) \geq \ldots \geq var\ (Z_p)$, where *var (Zi)* denotes the variance of Z_i in the data set being considered. The Z_i are called the principal components (Manly, 1994).

The purpose of this kind of analysis is that the variances of most of the indices will be so low as to be negligible. In that case the variation in the data set can be adequately described by the few Z variables with variances that are not negligible. The best results are obtained when the original variables are very highly correlated, positively or negatively. If that is the case then 20 or more original variables can be adequately represented by two or three principal components (Manly, 1994).

A principal component analysis (PCA) is estimated using survey data. Only 100 respondents participated in the market as sellers in Swayimana, whereas all respondents in Impendle were

market participants. An attempt is made to define transaction costs broadly, including information and transport costs. The choice of transaction cost variables included in this section is a result of a careful assessment of the circumstances of the production and marketing environment in both study areas. Variables used to explain transaction cost dimensions include distance to district road, in Km (X_1), distance to public phone, in Km (X_2), a dummy for whether the farmer owned a pick up truck or car (X_3), number of years the farmer has been residing in the areas (X_4), number of years of the formal education attained by the farmer(X_5), and finally, a dummy for whether the household head owned a TV/Radio set (X_6). The design of the survey easily allowed the observation of these transaction cost variables for market participants household heads. Household who did not participate in market as sellers were excluded from the study.

The above mentioned transaction cost variables are assumed to influence the magnitude of transaction costs faced by small farmers, their choice between informal and formal marketing channels, and thus their level of income generated. The two distance variables (X_1 and X_2) are important in that they represent two different dimensions of the overall marketing cost faced by small-scale farmers. District roads are the only paved (tarred) roads in each area and facilitate relatively easy access to markets for inputs, outputs and services in nearby towns, especially Pietermaritzburg. Public phones could be used in contacting relevant service providers as well as other farmers within the settlement or outside. As these two distances become greater, access and contact become more costly for the small-scale farmer in need of inputs, information, and a market for their products. Distance obstacles can be offset by the ownership of means of transport (car/truck) which can be used to reach nearby towns or services. The number of years a household has been living in an area as well as the number of years of formal education attained by the household head are used as proxies of the ability to network within the community. Networks are

thought to be very important in negotiating and enforcing contracts as well as in securing land tenure. Moreover, more educated and literate farmers have a higher probability of searching for innovations in commercial agriculture as well as in being able to contract with outsiders. Television or radio sets constitute a major source of information for sample farmers in both study areas.

Principal component analysis (PCA) was used to assess the dimensions of transaction costs and resulted in three dimensions, namely distance, assets and information, and education. Table 5.1 presents the estimated loadings of the three dimensions for the overall sample. Results of PCA analysis obtained separately from each study area, and which follow the same patterns as the combined sample are presented in the appendix 2.

Table 5.1 Transaction Cost Dimensions in Swayimana and Impendle (Combined data) (n = 220)

Dimensions	**Eigen**	**%var.**	X_1^*	X_2^*	X_3^*	X_4^*	X_5^*	X_6^*
Distance	1.608	26.8	**0.870**	**0.800**	0.203	0.370	-0.100	0.172
Assets	1.311	21.8	-0.100	0.302	**0.737**	0.179	-0.270	**0.750**
Information	1.060	17.6	-0.100	0.263	-0.050	**0.604**	0.784	0.030

* = standardized values of X

The first dimension accounts for 26.8 per cent of the total variation in transaction costs, while the first two account for 48.6 per cent of the variation. The three dimensions together account for 66.3 per cent of the total variation in transaction costs and mathematically can be written as follows:

Pc_1= **Distance** = 0.870 X_1 + 0.800 X_2 + 0.366 X_4 ---------- (1)

Pc_2= **Assets** = 0.302 X_2 + 0.737 X_3 + 0.751X_6 ---------- (2)

Pc_3= **Information** = 0.604 X_4 + 0.784X_5 ---------- (3)

Coefficients or loadings of each variable represent its estimated value or score with respect to the specific component or dimension. Hence, a positive sign on the *b 's* indicates that an increase in the loading of a specific variable lowers the transaction costs associated with a specific dimension. In other words, households closed to the district roads and public phone exhibit higher and positive score (i.e. 0.870 and 0.800, respectively) and will face lower transaction cost with respect to distance. Moreover, households with higher level of assets, such as car/truck and Tv/ radio ownership (i.e. 0.737 and 0.751, respectively) will face lower transaction costs. Finally, household head with high level of formal education (i.e. 0.784) and many years of residence (i.e. 0.604) in the specific areas can be expected to discover market information and linkages with at lower costs.

Distances to a district road and to a public phone strongly influence the overall distance component of the transaction costs. Overall, residents in the two study areas had a mean distance to district road of 6.3 kilometres with a median distance of 5.0 kilometres. Distance to district road ranged from 100 metres to 30 km. With respect to public phone, the mean distance was 3.7 kilometres with a median distance of 2.0 kilometres. The range for distance to public phone was between 400 metres to 17.20 kilometres. This first dimension of transaction costs is expected to have an inverse relationship with the number and quality of marketing channels used by the household. It is expected that as the transaction costs associated with distance decrease, marketing methods level and quality used by the household will increase. In other words, the less the transaction costs, the higher the marketing methods sophistication in term of quality and numbers. Also, improvement of secondary roads would reduce transport costs and traveling time,

increasing thus market participation.

The second dimension (**i.e. Assets**) is explained by the ownership of a car or truck (X_3) and a television or radio set (X_6). Only 33.0% of respondents owned a car or bakkie while 55.4% of them had a TV or radio set. Ownership of private means of transport is expected to facilitate the transportation of agricultural products as well as the discovery of various market outlets. Market information are crucial for the survival of small-scale farmers in the study area. Extension officers and neighbouring commercial farmers were mentioned as the main sources of farming information with 34.6% visiting operating extension officers and 20.4% cooperating in various ways with commercial farmers.

Years of residence in the respective district (X_4) and the level of formal education attained by the household head (X_5) determine the **information** and third dimension of transaction costs. Higher level of formal schooling reduces the cost of information faced by rural farmers. Informal interviews pointed to the fact that new comers in both areas, but especially in Swayimana, were more enterprising in agriculture than those who have been in the area for so many years. The latter group, may be content with the little they possess or just lack the skills, information and private entrepreneurship needed to engage in solid commercial agriculture. The second and third dimensions are expected to be positively related to the level and quality of marketing channels used by each farm-household whereas, the distance dimension is inversely related to them.

In conclusion, there exist strong interactions between the transaction costs, through their three dimensions, and the infrastructural framework under which small-scale farmers operate in both Swayimana and Impendle. The analysis of such interactions as demonstrated by the principal

component, can be very fruitful in understanding the dynamic revolving around transaction costs and different institutions which may help alleviate them. Given the fact that transaction costs affect market participation, price policies and other development policies can be expected to have very different behavioural and welfare implications for different subsectors of the farm population. Policies that reduce these costs are consequently important complements to other development policies such as price policies that influence supply response. As indicated elsewhere (Sadoulet, *et al.*, 2000), lowering transaction costs through improved transportation and the promotion of institutions for marketing (i.e. cooperatives for selling) would increase output by both increasing market participation and increasing production for market participant, - a prerequisite for the betterment of communal farmers in the two study areas as well throughout the country.

The following section presents a block-recursive model of transaction cost variables influencing marketing methods, which in turn determine the level of crop income generated by the households.

5.2 DETERMINANTS OF MARKETING METHODS AND CROP INCOME

Determinants of marketing methods and crop income are analysed in this section. To this end, a block-recursive model is estimated that evaluates the impact of transaction cost proxies on choice between different marketing (formal or informal) channels and their number for each household. The use and number of various marketing channels are assumed to be related to transaction costs as well as the size of allocated arable land to each household.

5.2.1. Specification of the block-recursive model

The aim of the study is to identify market constraints such that alternatives for improving household agricultural incomes in rural KwaZulu-Natal can be recommended. The model developed in this section explains the relationship between food crop revenue and measures of transaction costs, resources and farmer and household characteristics. The model hypothesizes that food crop revenue is explained by marketing methods used, the area of cultivated land, and farmer and household characteristics. In turn, marketing methods are dependent on transaction cost variables and the full area of arable land allocated to the household. Empirically the two equations constitute a block-recursive model (Gujarati, 1995:680).

The model is specified as follows:

Marketing methods (MKTMETHODS) = f_1 (Transaction costs, Land) ..... **(1)**

Crop revenue (CROPINCOM) =f_2 (Marketing methods, Cultivated land, Household and Farmer characteristics) ..... **(2)**

CROPINCOM represents the total food crop revenue, in Rand, of marketed output per household. MKTMETHODS describes the variety and quality of channels used by the household to market agricultural output (informal, i.e. neighbours, pension markets and roadside, and more formal channels such as hawkers, stalls in town, shops and supply contracts). From the above structure (1-2), it can be seen that there is no interdependence among the endogenous variables. That is, MKTMETHODS affects CROPINCOM, but CROPINCOM does not affect MKTMETHODS. Each equation exhibit a unilateral causal dependence (Gujarati,1995).

5.2.2. Transaction cost factors influencing marketing methods

Exogenous regressors include the area of allocated arable land, the dependency ratio of the household and specific proxy variables for transaction costs. A regional dummy variable distinguishing Impendle from Swayimana is also included. The latter is closer (65 km versus 85 km) to the urban market of Pietermaritzburg, so the dummy is expected to reflect lower information gathering costs. The identification of proxies for transaction costs expected to influence the choice of marketing channels in the study areas was based on the New Institutional Economics literature, especially Transaction Cost Economics (Dorward *et al.*,1998; Delgado, 1997; Harriss-White,1999; Kormawa and Von Oppen,1997). Equation (1) was estimated as:

Marketing methods index = f (AGEH, ACC, ELEC, COOP, DISTRA, LAND,

D-RATIO, DISTRICT) ..... **(3)**

where the explanatory variables and their expected signs are defined in Table 5.2. The dependent variable is an index showing depth in marketing methods used by the households. The greater the depth in marketing methods used, the greater the expected income generated from crop sales. Six market channels were used by 220 sample households (120 in Impendle and 100 in Swayimana), including neighbours, hawkers, roadside points, local shops, monthly pension markets and nearby towns. A set of three mutually exclusive variables was created and hierarchical scores were assigned to each such that neighbours and hawkers scored one (1), roadside, local shops and pension markets scored two (2) and towns scored four (4).The scores on these three variables were summed and the total was multiplied by the number of marketing channels (n) used by the household. Households used different techniques to inform potential customers about their products.

A binary variable was created yielding a score of one (1) for households who used notice boards or posters, and zero for no advertising.

Table 5.2 Hypothesized transaction cost variables influencing marketing methods of households in Impendle and Swayimana, 1999

Variable	Code	Description	Expected Sign
Age	**AGEH**	Age of the household head (in years)	+
Bank account	**ACC**	Household head maintains a bank account (1 if yes, 0 otherwise)	+
Electricity	**ELEC**	Household has access to electricity (1 if yes, 0 otherwise)	+
Cooperation	**COOP**	Household head cooperates with commercial farmers (1 if yes, 0 otherwise)	+
Distance	**DISTRA**	Interaction between distance (in Km) and vehicle ownership (Distra = Km if household does not have a vehicle, or 0 if household does have a vehicle).	-
Land size	**LAND**	Size of allocated arable land, in hectares	+
Dependency	**D-RATIO**	Dependency ratio in the household (consumers/worker)	-
Region	**DISTRICT**	Dummy variable for the district of the household (1 if Swayimana; 0, if Impendle)	+
Dependent variable: Natural Log of Marketing Methods Index (LMKTMETHOD)			

The marketing methods index was computed as follows:

Marketing methods index = {(Zchan + 5) * n)} * (Zadv +5)

where **Zchan** is the standardized value of channel scores, n represents the number of channels used by the household and **Zadv** is the standardized value of the advertising dummy. The constant term (5) is used to remove negative values from the system. A low score on the index shows that

a household uses few, thinly traded markets to sell its surplus food crops. Conversely, a high score, as can be observed in Figure 5.1, shows the distribution of the marketing method index.

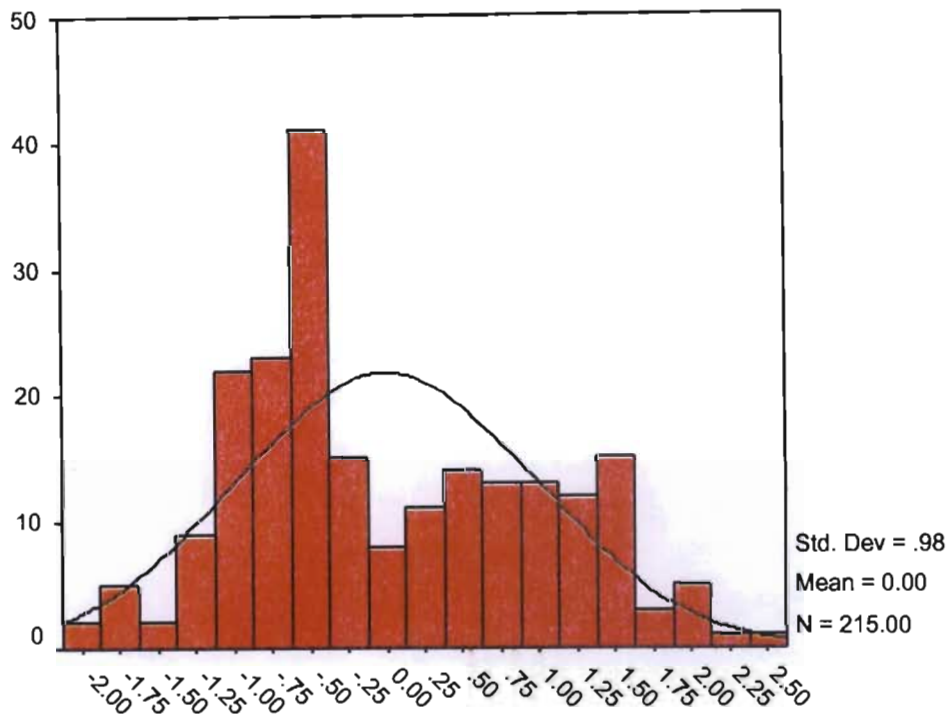

Figure 5.1 Distribution of marketing methods (LMKTMETHOD) residual index scores.

Older and more experienced household heads tend to have more personal contacts, allowing trading opportunities to be discovered at low cost. Age may also reflect increased trust and reputation gained through repeated exchange with the same party (Goetz, 1992). Older household heads are therefore expected to face lower transaction costs and to use more marketing channels. Having a formal bank account (ACC) increases contact with towns, where inputs and products

can be bought and sold. Electricity (ELECT) reduces transaction costs by improving access to information through radio and television.

Farming and marketing expertise of the large commercial farmers can positively contribute to the marketing practices of small-scale farmers. The cooperation (COOP) indicated by sample households consisted of production and marketing advice, and assistance in acquiring certain inputs and services (i.e. improved seeds, tractor services). Such cooperation with large commercial farmers is therefore expected to have a positive impact on reducing transaction costs and improving marketing methods. Distance and lack of transport in many parts of rural Sub-Saharan Africa are major constraints to expanding local production. They are also a welfare issue for women who sometimes have to carry heavy loads of goods on their heads for long distances (Delgado, 1997). In this study, DISTRA represents the interaction between the ownership of a vehicle and distances to a public telephone and district road. The sum of the two distances is multiplied by a dummy scoring 1 if the household does **not** own a vehicle and zero otherwise.

Consequently, distances faced by a household are not significant when in possession of a vehicle (car/bakkie). Ownership of a car/bakkie is expected to reduce transaction costs, offering greater depth in marketing methods. The size of land (LAND) is included because transaction costs are largely fixed costs which can be spread across more output on larger farms. Likewise, households with lower dependency ratios (D-RATIO), measured as the number of dependents (i.e. infants and school children) per on-farm worker (i.e. non-employed adults and pensioners) in the household, can market a greater share of their output and therefore face lower unit transaction costs. Table 5.3 presents the results of ordinary-least square (OLS) regression analysis of the marketing methods index.

Overall, most of the transaction cost proxies significantly influence the depth of marketing methods, and the signs of the estimated coefficients are consistent with *a priori* expectations.

Table 5.3 Results of OLS regression analysis of the marketing methods equations for Impendle, Swayimana and Combined samples (Dependent variable:LMKTMETHOD).

Variable	Expected Sign	Impendle (n =115)	Swayimana (n=98)	Combined (n =214)
AGEH	+	**0.017**[c] 0.167[b] (1.732*)[t]	**0.008**[c] 0.105[b] (1.158)[t]	**0.014**[c] 0.122[b] (1.860*)[t]
ACC	+	**0.530**[c] 0.235[b] (2.529**)[t]	**0.059**[c] 0.028[b] (0.296)[t]	**0.298**[c] 0.134[b] (2.028**)[t]
ELEC	+	**-0.408**[c] - 0.085[b] (-0 .962)[t]	**0.073**[c] 0.020[b] (0.217)[t]	**-0.074**[c] -0.036[b] (-0.284)[t]
COOP	+	**0.266**[c] 0.099[b] (1.112)[t]	**0.964**[c] 0.387[b] (4.309***)[t]	**0.627**[c] 0.241[b] (3.830***)[t]
DISTRA	-	**-0 .196**[c] -0.218[b] (- 2.286**)[t]	**-0 .171**[c] - 0.185[b] (- 1.906*)[t]	**-0.176**[c] -0.196[b] (-2.874***)[t]
LAND	+	**0.131**[c] 0.112[b] (1.264)[t]	**0.117**[c] 0.194[b] (2.178***)[t]	**0.114**[c] 0.153[b] (2.279**)[t]
D-RATIO	-	**-0 .062**[c] -0 .080[b] (- .838)[t]	**-0 .179**[c] - 0.174[b] (- 1.953 **)[t]	**-0.110**[c] -0.127[b] (-1.930*)[t]
DISTRICT	+	-------	--------	**-0.506**[c] -0.243[b] (-1.904*)[t]
CONSTANT		**1.764**[c] (2.245**)[t]	**1.739**[c] (3.001***)[t]	**1.924**[c] (3.781***)[t]
F-statistic		**3.898*** **	**6.133*** **	**7.424*** **
R^2		**0.202**	**0.321**	**0.224**

[c] = Regression coefficient [b] = beta values [t] = t-values

***, **, * Significant at the one, five and ten per cent levels of probability, respectively.

This is particularly true of cooperation with large commercial farmers, distance from telephones and district roads, the presence of a formal bank account and the age of the household head.

Since the dependent variable is in natural log units, the coefficients can be interpreted in percentage terms. For example, the coefficient of 0.014 for AGEH indicates that a unit (year) increase in age of the household head leads to a 1.4 per cent increase in the marketing methods index score, all other explanatory variables held constant. Likewise, a coefficient of - 0.176 for DISTRA indicates that the marketing methods index score is estimated to be about 18 per cent lower for households that do not own transport relative to those that do, *ceteris paribus*. The beta coefficients indicate the relative importance of each explanatory variable in the model. Thus, COOP and DISTRICT have the largest impact on the dependent variable. The area of arable land (LAND) positively influences the marketing methods index, but its impact (according to the beta coefficient) is less than that of COOP and DISTRA. The regional dummy is significant at the ten per cent level of probability but its coefficient carries an unexpected sign suggesting that information and transaction costs are higher in Swayimana than in Impendle.

Separately, in Impendle, the results indicate that maintaining a formal bank account (ACC), distance and ownership of means of transport (DISTRA) and the age of the household head (AGEH) are the main determinants of the marketing methods index. The coefficient of 0.017 for AGEH indicates that a unit (year) increase in the age of the household head leads to a 1.7 per cent increase in the marketing methods index score. Likewise, a coefficient of 0.530 for ACC suggests that the marketing methods index score is estimated to be about 53 per cent higher for households that maintain a formal bank account relative to those that do not, *ceteris paribus*. The beta coefficients suggest that ACC and DISTRA have the largest impact on the dependent variable.

The allocated area of arable land (LAND) positively influences the marketing methods index, but is not significant.

In Swayimana, cooperation (COOP) with neighbouring commercial farmers, the allocated area of arable land (LAND), the dependency ratio (D-RATIO), and distance and ownership of means of transport (DISTRA) significantly influence the depth of marketing methods, and the signs of the estimated coefficients are consistent with *a priori* expectations. A coefficient of 0.964 for COOP indicates that the marketing methods index score is estimated to be 96 per cent higher for households that cooperate with commercial farmers relative to those that do not, *ceteris paribus*. Likewise, a unit (hectare) increase in arable land (LAND) of the household leads to a 12 per cent increase in the marketing methods index score, all other explanatory variables held constant. According to the beta coefficients, COOP has the largest impact on the dependent variable in Swayimana, followed by LAND, DISTRA and D-RATIO.

5.2.3. Determinants of crop income

The variables used to estimate equation (2) are presented in Table 5.4, along with their expected signs. Conventionally, farm income includes both income in kind from subsistence consumption and income from cash sales of crops and livestock (Delgado, 1997). For the purpose of this study, the dependent variable is defined only as the income derived from the sale of food crops, omitting livestock sales. Formal livestock markets (e.g. auctions in Boston, near Impendle) are readily accessible owing to public investment in sales yards serving both commercial and small-scale livestock farmers. Equation (2) was estimated as:

CROPINCOM = f (LMKTMETHOD, CROPAREA, LIQUIDITY, HSIZE, D-RATIO,

VISITS, DISTRICT) .....**(4)**

It is expected that greater depth in marketing methods (LMKTMETHOD) will generate higher income from surplus crops. High transaction costs restrict the household to a few local markets where sales are discouraged by thin trading. Cultivated area (CROPAREA), measured as the area of allocated arable land cultivated by each household, is expected to bear positively on crop income because output is directly related to area cultivated. Non-farm activities and income play an important role in increasing the liquidity needed to purchase farming inputs.

Liquidity (LIQUIDITY) is measured as total cash in Rand, received either from welfare (pensions) and disability payments, wages, remittances and other non-farm activities (brick-making, beer sales, etc.), and from the sale of livestock. The number of dependants, defined as number of school children and those of non-school age, can negatively influence marketing participation of the household because a large portion of the food produced is used to meet dependents' consumption needs. On the other hand, the more on-farm workers in the household, the more likely it will produce a surplus, *ceteris paribus* (Low, 1986).

Hence, the variable D-RATIO, measured as the number of dependants (i.e. infants and school children) per on-farm worker (i.e. non-employed adults and pensioners) in the household, is expected to be inversely related to surplus production and crop income. Household size is included only as a control variable for D-RATIO.

Table 5.4 Hypothesized determinants of crop income, Impendle and Swayimana, 1999

Variable	Code	Description	Expected Sign
Marketing methods	**LMKTMETHOD**	Marketing methods index, in natural logs	+
Cropped area	**CROPAREA**	Cultivated arable land, in hectares	+
Liquidity	**LIQUIDITY**	Off-farm income and livestock sales, in Rand	+
Household size	**HSIZE**	Number of household members	
Dependency ratio	**D-RATIO**	Dependency ratio (consumers/worker)	-
Visits by extension officers	**VISITS**	Number of visits by extension officers per year	+
District of the household	**DISTRICT**	Regional variable (1= Swayimana, 0= Impendle)	+
Dependent variable: Food crop income (CROPINCOM)			

Visits by extension officers (VISITS) were found to be highly correlated with workshop participation organized by the extension services and could demonstrate the household head's commitment to commercial agriculture. These visits are therefore expected to have a positive impact on the sale of crops. The dummy variable (DISTRICT) is used to capture agronomic differences between the two study districts. This variable is expected to have positive impact because Swayimana (DISTRICT = 1) is more fertile than Impendle (DISTRICT = 0), and also property rights may be more secure as the area was not subject to betterment planning, a policy that distanced households from their arable lands to promote soil conservation.

Equation (4) could be estimated using OLS if it is assumed that the error term is not correlated with the stochastic variable "marketing methods index". However, to account for possible correlation with the error term, the stochastic variable was replaced with an instrumental variable (estimated marketing methods index) predicted from all of the exogenous variables in the block-recursive model. This was achieved using the two-stage least squares (2SLS) routine available in the Statistical Package for Social Sciences, version 8. Table 5.5 summarizes the results of the crop income equation. Again, the results are consistent with the hypothesized relationships. This is particularly true with respect to the significant and strongly positive effects of marketing methods index (LMKTMETHOD), cultivated arable land (CROPAREA) and off-farm income (LIQUIDITY) on crop sales.

Overall, greater depth in marketing methods, which indirectly reflects lower transaction costs faced by the households, has a strong positive impact on the level of income generated from crop sales. The lower the transaction costs faced, the greater the depth in marketing methods, and the higher the crop income. In absolute terms, the results suggest that a unit increase in the marketing methods index score will increase household crop income overall by R704.25. Beta coefficients, indicating the relative importance or impact of each variable in the model, suggest that marketing methods have the greatest impact on crop income generated in Swayimana and for the combined model. In Impendle, CROPAREA has the larger impact on CROPINCOM.

Table 5.5 Results of 2SLS regression analysis of the crop income equation for Impendle, Swayimana and Combined samples, 1999 (Dependent variable: CROPINCOM).

Variable	Expected Signs	Impendle (n=115)	Swayimana (n=98)	Combined (n=214)
LMKTMETHOD	+	**532.296**[c]	**1119.474**[c]	**704.249**[c]
		0.365[b]	0.660[b]	0.446[b]
		(2.084**)	(3.760***)	(3.251***)[t]
CROPAREA	+	**777.676**[c]	**142.670**[c]	**406.964**[c]
		0.431[b]	0.118[b]	0.307[b]
		(5.303***)[t]	(1.330)[t]	(4.639***)[t]
HSIZE		**- 96.781**[c]	**- 53.613**[c]	**-84.309**[c]
		-0 .128[b]	-0 .066[b]	-0.109[b]
		(- 1.478)[t]	(-0 .865)[t]	(-1.821*)[t]
LIQUIDITY	+	**0.058**[c]	**0.282**[c]	**0.102**[c]
		0.185[b]	0.426[b]	0.252[b]
		(2.058**)[t]	(5.145***)[t]	(3.907***)[t]
VISITS	+	**- 6.962**[c]	**57.386**[c]	**1.946**[c]
		-0.008[b]	0.061[b]	0.002[b]
		(-0.101)[t]	(0.729)[t]	(0.036)[t]
D-RATIO	-	**- 20.284**[c]	**227.924**[c]	**18.896**[c]
		-0.017[b]	0.130[b]	0.013[b]
		(-0.214)[t]	(1.499)[t]	(0.229)[t]
DISTRICT	+	-------	----------	**487.719**[c]
				0.148[b]
				(2.179**)[t]
CONSTANT		**- 455.328**[c]	**- 1454.013**[c]	**-760.527**[c]
		(-0.660)[t]	(1.727*)[t]	(1.274)[t]
F-statistic		**9.239*** **	**13.638*** **	**14.324*** **
R^2		**0.337**	**0.47**	**0.326**

[c] = Regression coefficients
[b] = beta values
[t] = t-values
***, **, * Significant at the one, five and ten per cent levels of probability, respectively.

This result shows that formal marketing channels (higher index score) are associated with higher crop income, as can be seen in the boxplot of combined sample in Figure 5.2.

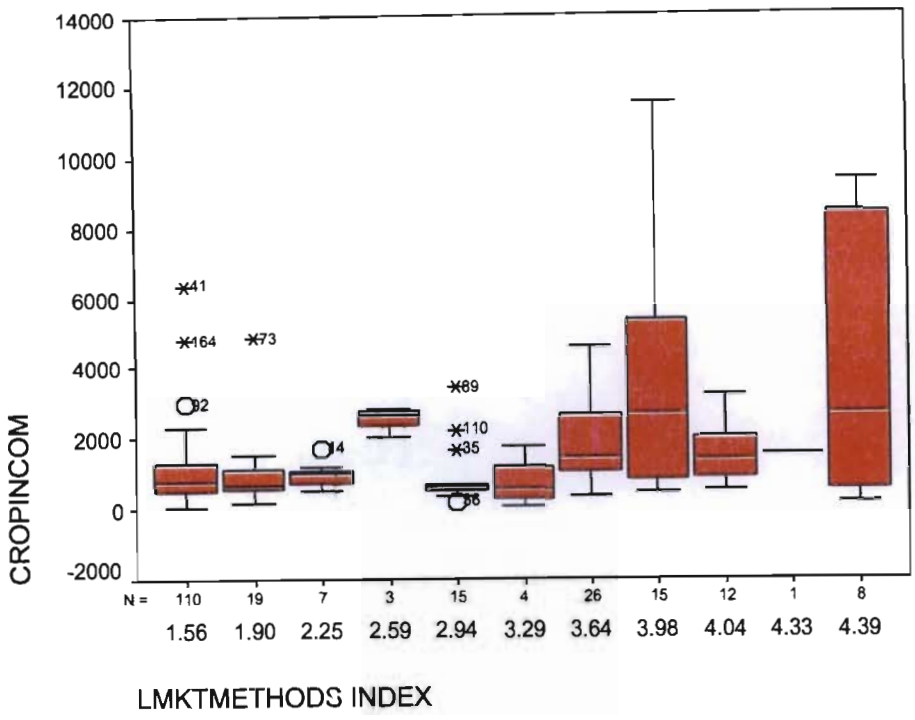

Figure 5.2 Boxplot of crop income and index scores for the combined sample (n =220)

The boxplot displays summary statistics for the distribution. It plots the median, the 25th percentile, the 75th percentile, and values that are far removed from the rest (Norussis/SPSS Inc, 1993). The median in each boxplot determines the central tendency and the length of the box shows the spread, or variability of observations. Figure 5.2 contains boxplot of income generated from the sale of crops for the overall sample. The results show that 50 per cent of the 220 sample households have the lowest market methods index scores, implying that these households were faced with relatively higher transaction costs in marketing their products. The figure also demonstrates that as the marketing methods index score increases, so does the level of crop income in general. From these plots, it can be seen that farmers with market methods scores of 1.56 (n = 110), 1.90 (n =19) and 2.25 (n = 7) have approximately similar distributions for crop

income although with different extreme values. Since only one farmer scored 4.33, there is no variability. Farmers who scored 2.59 (n =3), 3.98 (n =15) and 4.39 (n =8) have much higher median crop incomes than other groups. With the three farmers who scored the highest (4.39) having the highest median of crop income, these results confirm expectations of the income equation whereby farmers with higher market method index scores, implicitly facing lower transaction costs, are expected to yield a higher crop income. Boxplot results for each study area are presented separately in Appendix 4.

The area of cultivated arable land (CROPAREA) is also significant at the one per cent level of probability and, according to the beta coefficients, is the second most important determinant of crop income after marketing methods. The results also suggest that income from non-agricultural activities (LIQUIDITY) is critical to farming enterprises in the two regions. Wage income and welfare payments, together with income from the sale of goods and services, provide the liquidity needed to purchase inputs and contractor services for the production and marketing of agricultural outputs.

Although conforming to *a priori* expectations in terms of having a positive effect on the level of crop income, the number of visits by extension officers (VISITS) is not statistically significant. Extension services in the two study areas are mainly confined to small projects such as community gardens for subsistence. A change in the household size (HSIZE) significantly and negatively influences the level of income generated from the sale of crop, while the dependency ratio (D-RATIO) has an unexpected sign but is not statistically significant. The HSIZE and D-RATIO variables are correlated ($r = 0.197$). When household size is omitted from the income equation, the dependency ratio is, as expected, negatively associated with crop income. The result however

suggests that larger farm households with higher dependency ratios would generate less income from the sale of crops. As expected, the regional dummy variable (DISTRICT) coefficient is statistically significant. Swayimana is the more fertile area and was expected to generate higher crop yields.

In conclusion, this study hypothesizes that the level of income generated from food crop sales by small-scale farmers in the Impendle and Swayimana regions of KwaZulu-Natal is influenced by transaction costs and certain household and farm characteristics. The results of a block-recursive model suggest that high transaction costs are detrimental to the efficient operation or existence of markets for inputs and outputs. The cost of information and the costs associated with the search for trade partners, distance to formal markets and contract enforcement are likely to influence the marketing of food crops. Regression analysis shows that the depth of marketing methods is significantly influenced by transaction cost proxies such as cooperation with large commercial farmers and ownership of means of transport, while a two-stage-least squares (2SLS) analysis reveals that the level of crop income generated is determined by the depth of marketing methods, the size of allocated arable land and off-farm income. Households with lower transaction costs, and having sizeable allocated land and off-farm income can be expected to generate higher income from food crops.

The next chapter presents a summary of the study results and concludes with general conclusions and recommendations for policy initiatives.

CHAPTER 6

CONCLUSIONS AND POLICY IMPLICATIONS

Access to arable land has been acknowledged as one of the main features of land reform in South Africa. However, many communal farmers with access to arable land are faced with various constraints in agriculture. Income generation from farming is one of the key factors in eradicating poverty and stimulating the rural economy. In this study, marketing constraints faced by communal farmers in the Impendle and Swayimana regions of KwaZulu-Natal were examined and binding constraints identified.

The empirical analysis used data collected in 1999 from a sample of 240 households in Impendle and Swayimana (120 households in each area), two communal areas with high agricultural potential. Multi-stage sampling techniques were employed to draw a representative sample of households, and a predesigned questionnaire was used to record information.

Land in these communal areas is not held as private property with fully exclusive and transferable rights vested in individuals or juristic persons. The tribal authority allocates land to residents according to customary rules. On average, households had one hectare of arable land in Impendle and 1.8 hectares in Swayimana. Food crop production is the common feature of agriculture in the study areas, with potatoes in Impendle and madumbis in Swayimana being the main food crops produced and sold. Beans, maize and other green vegetables were some of the other crops produced and sold. On average, each household produced 4.2 crop types in Impendle and 5.8 enterprises in Swayimana. The median annual crop income was R725 in Impendle and R1200 in Swayimana.

The analysis also revealed that the median age of the household head was 59 years in Impendle and 60 years in Swayimana. The level of formal years of schooling was low, with a median of 5 years. Overall, only 59% of household heads were able to speak and write English making it difficult for many households to trade outside their respective boundaries. Due to the lack of creditworthiness, only one household in each area used credit for the purchase of farm inputs. This may explain why an overwhelming number of households in Impendle would choose informal credit sources. This however is in contrast with Swayimana respondents who would rather deal with banking institutions as sources of credit.

Marketing constraints faced by respondents in the two study areas revolved mainly around the lack of market outlets, transport and bad roads. Training needs included marketing skills, planning of production and soil conservation techniques. Government extension services were perceived to be inadequate with respect to the needs of individual farmers because their activities mainly revolved around specific projects, such as community gardens. A Chi-square (χ^2) analysis of extension visits and membership of farmers' associations with respect to allocated arable land revealed that membership of farmers' associations was significantly influenced by the size of allocated arable land. Most respondents with more than two hectares of allocated arable land were members of the local farmers' association in Swayimana. In Impendle, however, this relationship was not significant. This may be explained by the fact that farm sizes showed less variation in Impendle.

Transaction costs or costs of trade have generally been recognised as one of the main constraints impeding market participation in many developing societies, particularly those at early stages of transformation. Small-scale farmers in Africa share this predicament. They face high transaction

costs in marketing their agricultural products, due in large part to poor physical and institutional infrastructure. A principal component analysis (PCA) of the entire sample revealed three transaction cost dimensions, namely **distance** to markets, **assets** and **information**.

Transaction costs, by their very nature, are difficult to measure but revolve around the overall distance to market centres, production and marketing information, various networks in the community and certain farm, household and farmer characteristics. The hypothesis that the variety and quality of marketing channels was influenced by transaction cost variables, which in turn determined the level of crop income, was tested using a **block-recursive model**. An index of marketing methods scores was constructed as a dependent variable, and results of an ordinary-least-squares (OLS) regression analysis of the overall sample indicated that the depth in marketing channels (LMKTMETHODS) is significantly influenced by cooperation with large commercial farmers (COOP), interaction between distance and ownership of means of transport (DISTRA), allocated arable land (LAND), having a formal bank account (ACC), and the age of the household head (AGEH). In Impendle, operating a formal bank account, distance and ownership of means of transport and the age of the household head were the main determinants of the depth in marketing channels. In Swayimana, cooperation with nearby commercial farmers, the allocated area of arable land(LAND), the dependency ratio, and distance and ownership of means of transport were the most significant factors affecting marketing methods.

The level of income revenue derived from the sale of food crops was used as a dependent variable in the second equation, and a two-stage-least-squares (2SLS) analysis was used to estimate this model. Overall, the empirical analysis supports the hypothesis that transaction costs are a primary determinant of crop income. Greater depth in marketing methods, which indirectly reflects low

transaction costs faced by the households, has a positive influence on the level of income generated from crop sales. The results agree with expectations, whereby households facing lower transaction costs generate higher levels of crop income. Three key determinants with statistically significant coefficients - the depth in marketing methods (LMKTMETHOD), the cultivated area (CROPAREA) and off-farm income (LIQUIDITY) - had positive impacts on the level of crop income. The significant impact of a regional dummy (DISTRICT) on crop income suggests that the fertility of the study area also affects crop income.

It is clear from the results that fundamental institutional changes are required for economic development in these rural settlements. In terms of policy implications, it can be expected that an improvement in rural infrastructure (improved roads, telecommunication systems, banking facilities, legal system), an effective extension service and marketing institutions, such as market places and marketing associations, would reduce the costs of transacting for these small-scale farmers. The "public good" nature of some of these features certainly call for an important and strategic role for the state as a facilitating and coordinating institution. Poor infrastructure and lack of support services will keep a large number of communal farmers in subsistence agriculture.

Visits by extension officers and membership of farmers' associations represent sources of market information. The low level of contact between extension officers and farmers in both study areas suggest a need to make extension services more effective. These services should play a role in providing the necessary information on farming activities and the training skills (e.g. in marketing and soil conservation) required by emerging farmers. The sample farmers were geographically dispersed with secondary roads usually of poor quality, and with a volume of business insufficient to encourage private sector service provision. However, cooperation with large-scale commercial

farmers was the principal transaction cost determinant influencing the depth in marketing methods used by the households. This suggests that farming and marketing expertise of large commercial farmers or other well-informed farmers, if shared, could play a positive role in the small-scale sector. Therefore, incentives for local level arrangements encouraging such cooperation on a continuing basis between the two sectors should be explored and created.

In order to compensate for missing markets and to reduce transaction costs, farmers may develop institutions, as a collective action, to provide needed services. At the national level, the state should play a key role in sustaining the regulatory framework under which market participants can operate. Marketing facilities (i.e. market places) and associations (i.e. grass- root marketing organisations), combined with secure property rights and contract enforcement, could create a sound environment for private sector involvement in the small-scale agricultural sector. Locally, both Impendle and Swayimana have ideal spaces for marketplace settings. Impendle farmers could use the tribal land adjacent to Impendle village along the Impendle road. The ideal location for a market place in Swayimana would be the space across the major taxi stop, between Swayimana primary school and Gcumisa clinic, along the district route. Small self-sustaining groups or marketing organisations based at "grass roots" level, run for and by the participants, could address the real marketing needs of member-farmers. The state should play a pivotal role in fostering such arrangements and brokering partnerships between these groups and private investors by providing a sound and secure environment for business. Experiences elsewhere in Africa point to the failure of top-down supply strategies. A study on market creation, identifying for instance, where market places can be established, to assist policymakers in their quest for a thriving small-scale sector would be needed. In addition, equity-sharing agribusiness ventures in transport, storage, packaging and other value-adding activities with partners from the commercial farming and

marketing sectors could greatly stimulate small farm activities in these areas.

High transaction costs and risks also constrain the rental market for arable land in the communal areas of KwaZulu-Natal. Action research conducted in other parts of KwaZulu-Natal has shown that small, incremental adaptations to customary institutions can promote the rental market with both equity and efficiency gains in farming. Farmers gain access to additional land while non-farming households gain rental income from land that would otherwise be underutilised. Further research may also seek to measure returns from investments in physical and institutional infrastructure. As for electronic commerce, studies can be undertaken to assess the viability of e-commerce and its requirements in the context of communal areas with access to electricity. The state should also consider incentives to cellular phone providers to service these areas.

Liquidity constraints were also mentioned as obstacles to farming in the study areas. Income generation through non-farm activities is crucial for investment in agriculture. Employment policies or strategies, therefore, should pay special attention to the factors that permit increased participation in non-farm income activities by at least some members of the households, since they would then remit or bring in extra income which can be invested in farming. To compensate for the lack of formal financial institutions around them most respondents relied on informal sources of credit such as neighbours, relatives and friends. However, some farmers would have preferred to have formal financial institutions as their sources of credit. Obviously, this calls for microfinance institutions with programmes to extend loans to resource-limited farmers. These farmers do not have the collateral needed to access the financial services in the formal banking sector. Programmes combining savings, business development training, networking and farmer support would be needed. However, because of recent failures, considerations should be given

to policies that aims to incorporate informal lending schemes (i.e. stockvel) into the broader financial system of the rural areas.

To conclude, it can be stated that the two study regions present weak physical and institutional infrastructure, and so, a considerable potential could be mobilized if market outlets and roads conditions were improved. Such investments, as shown elsewhere, entail gains by improving aggregate productivity. If institutional and physical infrastructure innovations are implemented, making it easier for private traders and others to service these regions, increased agricultural productivity could lead to a sustainable and accelerated market development in communal areas.

Designing the right incentives, providing public goods, and reforming inappropriate policies, so as to maximize the potential for higher income, is recommended. The promotion of responsive local initiatives combined with appropriate physical and institutional infrastructure which address transaction costs and access to information and assets is imperative in order to create markets and assist in generating higher income from farming activities. Policies or institutional innovations which can reduce barriers or obstacles to the marketing of food crops - such as public investments in improved transport, roads and telecommunication infrastructures and other public institutions such as security of goods, contract enforcement and marketplaces within these regions - could stimulate the production and marketing activities of the sample farmers. By reducing transaction costs in the production and marketing of food crops, growth linkages can be created, promoting improved livelihoods in the rural areas of South Africa.

Summary of policy recommendations

Emphasis is given to long-run sources of growth and what initiatives the government should undertake. In sum, public investments are highly recommended in research, extension, physical and legal infrastructure. Specifically, development strategies should include the following:

- Invest in the improvement of physical infrastructure (e.g. roads) and means of communication (e.g. telephone and mail delivery).
- Improve and broaden the scope of agricultural extension service.
- Facilitate collective action for input supply and for discovering other marketing networks or outlets
- Promote an active land rental market with long term contracts.
- Promote cooperation between communal and commercial farmers.
- Stimulate private sector involvement by promoting a dependable impartial contract enforcement mechanism within communal areas.
- Organize periodic agricultural training sessions with rural communities.
- Facilitate the creation of marketplaces within communal areas.
- Identify viable off-farm alternatives for employment generation.

Limitations of Study

Transaction costs have been differently defined and are applied to a wide range of problems which has attracted an diverse set of authors, disciplines and prescriptions. Confronted with this array of information, the present study attempted to create an index of transaction cost proxies. The index does not include all determinants of transaction costs and should be viewed as an attempted index. Furthermore, this study is based on data collected from only 240 households across two districts. A larger sample covering more regions would provide more information about regional differences and better estimates of model parameters.

CHAPTER 7

SUMMARY

The purpose of this research has been to assess marketing constraints which determine market participation by the sample households. The study focused on factors and constraints that may influence income generation from farming by the communal small-scale farmers in two regions of KwaZulu-Natal. The identification of such factors might support efforts to create the appropriate environment for a viable small-scale farming sector. Generally, marketing problems or constraints have several dimensions, including price taker status, weather uncertainty, off-farm supply sources and infrastructure. In this study, however, transaction costs in exchange or trade and certain household characteristics were hypothesized to influence the depth and quality of marketing channels used, which in turn determined the level of crop revenue. To test this hypothesis, the New Institutional Economics (NIE), particularly Transaction Cost Economics (TCE) theory, served as the framework under which the research was conducted. Where neo-classical theories tend to focus on economic forces to allocate resources (prices, markets and regulations), NIE and TCE bring in transaction costs and institutions set to reduce them into the equation. In so doing, they complement solutions offered by many of the neo-classical analyses.

The transaction cost approach has demonstrated the impact of transaction costs on the existence or non-existence of markets in any economy, especially in Third World economies in early stages of transformation. It introduces transaction costs as the potential obstacle for market formation (or failure). In contracting terms, there are *ex ante* and *ex post* transaction costs. *Ex ante* transaction costs are the costs of drafting, negotiating and safeguarding an agreement. *Ex post* transaction costs include all the costs associated with running contracts and correcting transaction

irregularities. Transaction costs are the costs of exchange, including costs of searching, screening trade partners, bargaining, transferring, monitoring, and contract enforcement. These costs can be *explicit* (i.e. transportation costs) or *implicit* (i.e. opportunity cost of time spent searching for partners or new market outlets). The higher these costs, the lower will the occurrence of any exchange be and thus the lower the profit from trade.The transaction cost approach suggests that marketing institutions and the state play a crucial role in decreasing transaction costs.

Institutions are the "rules of the game"and are broadly defined as means of reducing transaction costs. They consist of a combination of formal rules (such as those regulating the structure of policy, property rights, and contracting), informal constraints (norms of behaviour or customary rules of the game), and enforcement practices. Implicitly, physical and institutional infrastructure that can reduce transaction costs become even more important for markets to operate efficiently. Of crucial importance is also the role of the state in securing a sound environment for the private sector's involvement in the marketing of agricultural products. The state's definitions and protection of property rights are essential to exchange, because they help establish, interpret and enforce a set of rules and procedures governing the marketing activities. The presence of institutions such as notarising services for property rights, security forces, banking facilities, courts, telecommunication services and improved access roads can increase trade. Such institutions not only have the effects of decreasing transaction costs, but also can lead to a greater involvement in all aspects of agricultural marketing by the targeted population.

Moreover, the transaction cost approach suggests that only by tackling norms and traditions, under which exchange is carried out, that lowering the costs of exchange can occur. Trade is expected to increase as transaction costs decline, thus affording better terms of trade, in part

because of the uniformity of institutional structures among trade partners. The transaction cost approach calls for adequate infrastructure, including transport and telecommunication networks, that permit the efficient movement of information, goods and services.

This study is based on data collected in surveys conducted first in the communal area of Swayimana during January/February 1999 from a sample of 120 small-scale farmers, and in Impendle region during April/May 1999, also from a sample of 120 small-scale farmers. The study hypothesises that the depth in marketing methods (i.e. number and quality of marketing channels) is influenced by transaction cost factors and some household head characteristics, which in turn determine the level of crop income. Little research has been done on the impact of transaction costs faced by small-scale farmers on the marketing of their products in the communal areas of South Africa. The two study areas of Impendle and Swayimana represent two distinct bioclimatic regions of KwaZulu-Natal, both with high agricultural potential. Multi-stage sampling techniques were used to collect data, which were recorded in a predesigned and tested questionnaire. One of the characteristics of farmers within the two regions is that they are in transition from subsistence to commercial farming. As these farmers progressively become market-oriented, they inevitably become subjected to trade costs. Thus, the level of transaction costs faced by a household would determine the combination of cash and subsistence crops to produce.

Sample farmers in the study areas grew more than one food crop for sale and for home consumption.The most dominant feature of agriculture in these regions is the prominence of livestock husbandry in Impendle and food crop production in Swayimana. Farmers devote most of their allocated arable land to food crops such as madumbi, maize, potatoes, beans, and various leafy vegetables. These traditional subsistence food crops have also become important cash crops.

Maize is the staple diet of most residents and was produced by virtually all surveyed households. In addition, madumbi was produced by over 90 per cent of the sample households in Swayimana. For both regions, however, the only other crops cultivated by at least half of the surveyed households were potatoes and dry beans. A wide variety of minor crops such as sweet-potatoes, cabbage, spinach and other green leafy vegetables were produced. Off-farm income sources varied from wage employment in towns, brick-making, wage remittances and beverage sales.

The results indicate that the majority of sample household sell their produce mainly through informal channels such as neighbours, pension markets and local shops. Poor roads and communication systems, transport, capital constraints and low levels of education were some of the major constraints faced by farmers in the study areas. Marketing facilities and skills were lacking and extension services were inadequate.The two study areas are relatively well served by taxi passenger vans: a trip to Swayimana, for instance, takes about an hour from the provincial city of Pietermaritzburg. Residents of these areas often commute to Pietermaritzburg and adjacent towns (Wartburg, Pinetown, Howick and Durban), sometimes on a daily basis to work and/or trade.

Empirical analysis agrees with the hypothesis that transaction costs are a primary determinant of crop income level. The most influential transaction cost factors are related to the variety and quality of marketing channels (LMKTMETHODS) used by the household to market agricultural output. Overall, the variety and quality of marketing channels(i.e. depth) is significantly influenced by the cooperation with neighbouring commercial farmers, the distance and means of transport interaction, and the size of allocated arable land. Greater depth in marketing methods, which indirectly reflects lower transaction costs faced by the household, has a positive influence on the

level of income generated from crop sales. The results agree with expectations, whereby households facing lower transaction costs generate higher levels of crop income. Three key factors with statistically significant coefficients - the depth in marketing methods (LMKTMETHODS), the size of cultivated arable land (CROPAREA) and off-farm income (LIQUIDITY) - positively influence the level of crop income (CROPINCOM). The significant impact of the regional dummy on crop income implies that the fertility of the study area also affects crop yield.

The policy implications of the results are that there may be substantial benefits in developing better infrastructure to effectively link these production areas to market centres, and in improving market knowledge by providing more relevant, accurate public market information and farming skills. Transaction costs could be significantly reduced if better roads and marketing facilities were provided. Therefore, specific policies addressing the constraints and limitations of communal farmers through physical and institutional change, market information, development of communal or rural markets, and provision of appropriate incentives are required. More research is however needed to identify the most efficient ways of generating higher crop income for communal farmers.

In sum, it can be stated that market development in the study areas is constrained by poor physical and institutional infrastructure and weak socio-economic status of household heads. Major constraints include poor roads and communication systems, transport, the absence of a rental market for land, an uncertain legal system, low levels of education and limited knowledge of English amongst household heads. Consequently, many households face high transaction costs in input, credit and product markets. This study has demonstrated that transaction costs affect marketing participation and thus income generation by small-scale farmers in the two study areas.

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APPENDIX 1

THE SURVEY QUESTIONNAIRE

UNIVERSITY OF NATAL

DISCIPLINE OF AGRICULTURAL ECONOMICS

Household Questionnaire

DATE: ---------- **INTERVIEWER'S NAME:----------**

These questions relate to all household members including members not present at the time of interview (e.g., migrant workers who contribute to household income). A household refers to a family that has its own crop land, or a group of families that have rights to the same crop land. The information provided here is strictly confidential and will be used for research purposes only by staff of the Discipline of Agricultural Economics, University of Natal.

Geographic position and Region ----------
KwaZulu-Natal

District and Place ----------

Betterment planning implemented? ----------
------Yes or No

Random No. ----------

SECTION 1: HOUSEHOLD CHARACTERISTICS

1.1 Household composition (please mark respondent with an X)

Household member	**Sex**	**Age**	**Occupation***	**Cash income per month (Rand)**	**Cash remitted per month (Rand)**	**Pension or disability payment per month (Rand)**	**Education****
1Male head	**M**						
2 Female head	**F**						

*Occupation should be categorized as Wage Employed (E), Self-employed (SE-e.g. farmer, taxi, etc.), Housekeeper (H), Scholar or Student (S), Disabled (D) if in receipt of a disability grant, Pensioner (P) if in receipt of a pension, Unemployed (U) if seeking work, Infant (I) if too young to attend school, or Vagrant (O)

**Education: school standard passed.

1.2 Can the family member responsible for management decisions (such as what to produce) speak/write English?

SPEAK ---------- Yes/No

WRITE ----------Yes/No

1.3 Other non-farm income earned during past year.

Activity	Cash income during past year (Rand)
Handicraft	
Rental income from land	
Hiring out equipment	
Temporary work (e.g. on farms)	
Block making	
Repairs to cars & houses	
Retailing food & beverages	
Taxi service	
Hawking or processing products purchased from farmers	
Other (please specify)	

SECTION 2: FARM CHARACTERISTICS

2.1 What is the size of your land holding (specify units)? ----------

2.2 Are you satisfied with the size of your farm? ---------- Yes/No

2.3 How far is your arable land from your house?(if betterment location)

----------Km

2.4 Are you satisfied with the location of your farm? ---------- Yes/No

If not satisfied, what are the main reasons?

2.5 Does the household have more than one plot of arable land in different areas?-----Yes/No

2.6 Does the household have access to land in a community garden? ----------Yes/No

2.7 If "Yes", is that land irrigated? ----------Yes/No

2.8 What is the size of your garden plot? (specify units) ----------

2.9 Did the household plant all of its own arable land last season? ----------Yes/No

2.10 If "no", what portion of its arable land did it plant? (Tick where appropriate)

Portion	**Dry land**	**Irrigated land**
All (100%)		
Most (75%)		
Half (50%)		
Some (25%)		
None		

2.11 List the main reasons for not cultivating all of the arable land.

1. ----------
2. ----------
3. ----------
4. ----------

2.12 Did the household lease or lend any of its unused land to another household to grow crops last season?

----------Yes/No

2.13 Did the household hire or borrow extra land to grow crops last season? ----------Yes/No

2.14 Does your house have **electricity?** ----------Yes/No

2.15 Does your house have access to a telephone? ----------Yes/No

2.16 How far is the nearest public phone? ----------Km

2.17 Does your house have access to a postal service? ----------Yes/No

2.18 How far is the nearest mail box? ----------Km

SECTION 3: AGRICULTURAL PRODUCTION

3.1 Were any of the following crops produced last season (1997/1998)?

Crops grown during past year

Crop	Grown during past year (Yes/No)	Sold during past year (Yes/No)	Value of sales (Rands)	Where sold? *	Distance to market (Km)	Mode of transporting produce **	Frequency of marketing	Unsold quantity (%)
Maize -green---								
-grain----								
Sugarcane								
Potatoes								
Dry beans								
Sweet potatoes								
Madumbis								
Groundnuts								
Green vegetables								
Tomato								
Cabbage								
Timber								
Other								

*Hawkers (HA), Neighbours (NE), local shops (L), Pensioners market (PM), Millers (MIL), Chain stores (CS), Municipal market (MM), Government agency (GA), Informal market in town (TO), Roadside stall (RS).

**Carried by household members (Carry), Own vehicle (Own V), or Service e.g. bus, taxi or contractor(Contract)

3.2 Why do you farm or grow these specific crops?

3.3 Would you like to grow or farm something else? ----------Yes/No

If "Yes", what would you like to grow?

3.4 Do you think that there is a market for the products mentioned in 3.3?

----------Yes/No

SECTION 4: LIVESTOCK

4.1 Which of the following does the household have?

Livestock	**Number owned during last year**	**Number sold during last year**	**Sales value** (Rand)	**Where sold?***	**Distance to the market** (Km)
Bulls (Nkunzi)					
Cows					
Oxen					
Goats					
Sheep					
Pigs					
Chickens (Zulu)					
Chikens (Broilers)					
Eggs sales					
Milk sales					
Other (**specify**)					

*Hawkers (**HA**), Neighbours (**NE**), local shops (**LS**), Pensioners market (**PM**), Chain stores (**CS**), Government saleyards (**GS**), Informal markets in town (**TO**), Private saleyards (e.g Stockowners) (**PS**), Private abbatoir (**AB**).

SECTION 5: FARMING EXPENSES

5.1 Which of the following items did the household use last season?

Inputs	**Used** (Y/N)	**Quantity used**	**Total cost** (Rand)	**Supplier** *	**Transport** (method of) **	**Credi t used** (Y/N)	**Source of credit** ***
Fertilizer LAN							
Mixes ****							
Manure							
Maize seed							
Other seed							
Chemicals 1							
2							
Veterinary							
Hired: Tractor ploughing services							
Transport services							
Draught animals							
Farm labour							

*Shop or Depot (**shop**), Savings club (**club**), Farmers' association/cooperative (**coop**), Neighbour (**local**)

Delivered by Supplier (Deliv**), Carried (**Carry**), Own vehicle (**Own V**) or Hired Service e.g. bus, taxi, or contractor (**Contract**).

***Local lender (**local**), Supplier (**suppl**), Commercial Bank (**bank**), KFC (**KFC**), Savings club (**club**).

****Mixes = composite fertilizers like 2.3.2, 3.2.1, etc.

SECTION 6: INVESTMENT IN CAPITAL EQUIPMENT AND ASSETS (movable)

6.1 Which of the following assets does the household possesses?

Asset	Yes or No	Number owned
Car		
Truck		
Motorbike		
Tractor		
Plough		
Disc harrow		
Planter		
Trailer		
Knapsack sprayer		
Fridge / Freezer		
T.V.		
Generator		
Milk processing equipment		
Beer production equipment		
Food processing equipment		

Maize mill equipment

- Hand operated ----------Yes/No
- Motorized ----------Yes/No
- Electric ----------Yes/No

SECTION 7: SAVING ACTIVITY

7.1 Does the household have a savings account? ----------Yes/No

7.2 How far is the closest banking branch from your house ? ---------- Km

7.3 Can you get a taxi when you need one? ----------Yes/No

7.4 How far are you from the taxi/bus route? ----------Km

7.5 How many hours does it take to get from your house to town and back if a taxi/bus service is used? ----------Hours

SECTION 8: TENURE CHARACTERISTICS

8.1 How long has your family lived here? ----------Years

8.2 How was the land acquired by the household? (**Tick where appropriate**)

Acquisition	**Yes**
Inheritance	
Purchase	
Long term lease	
Government allocation	
Tribal authority allocation	
Other (**specify**)	

8.3 Who owns your land? (**Tick where appropriate**)

a) family ----------

b) nkosi ----------

c) government ----------

d) other (**specify**) ----------

8.4 If your family owns the land, do you have any proof of ownership (Title of deeds, Tax certificate, etc)? ----------Yes/No

8.5 Has the household made any fixed improvements on its land? ----------Yes/No

If "yes", **tick where appropriate**

Improvement	**Yes**
Fences	
Farm buildings	
Storage for crops	
Milking parlours	
Chicken houses	
Perennial pastures	
Timber (tree crops)	
Water points for livestock	
Silage pit / Silo	
Other (**specify**)	

SECTION 9: LAND RIGHTS

9.1 Are other people allowed to use your land (e.g for grazing during winter)?----------Yes/No

9.2 Have you ever fenced in your arable land to protect it from stray cattle?----------Yes/No

If **No,** why not? (**Tick where appropriate**)

Reason	
Not allowed to fence off arable land	
People steal fences	
Fencing is too expensive	
No need for fencing	
Other (**specify**)	

9.3 Can the household rent out its unused land to another farmer? ----------Yes/No

9.4 Can the household sell part of its land if it wants to ----------Yes/No

SECTION 10: MARKETING AND FARMERS' INSTITUTIONS

10.1 How do the buyers that buy directly from you, know about your products?

- Product 1 ---------- ----------
- Product 2 ---------- ----------
- Product 3 ---------- ----------
- Product 4 ---------- ----------

10.2 Do you process your own farm products (e.g selling meals, selling maas)?---------Yes/No

10.3 What agricultural products are processed and how are they sold?

Products	**Sold as***	**Where sold?****

*Meals (**meal**), Packaged maas/milk (**pack**), Other (specify).

Hawkers (hawk**), Neighbours (**neigh**), Local shops (**shop**), Pensioners'market (**pension**), Hospital (**hosp**), Schools (**school**), Other (specify).

10.4 If you cannot sell your surplus product, what do you do with it?

- Surplus Product 1 ---------- ----------
- Surplus Product 2 ---------- ----------
- Surplus Product 3 ---------- ----------
- Surplus Product 4 ---------- ----------

10.5 What are the main obstacles to marketing your products?

1. ---------- ----------
2. ---------- ----------
3. ---------- ----------
4. ---------- ----------

10.6 How do you set or obtain a price for your products?

- Product 1 ---------- ----------
- Product 2 ---------- ----------
- Product 3 ---------- ----------
- Product 4 ---------- ----------

10.7 Do any of the following happen in the marketplace?

	Market*
Taxi owners threaten you if you do not use their services	
Other sellers threaten you if your price is lower	
Other sellers threaten you if buyers buy only from you instead of them	
Other sellers threaten you if you are a newcomer to the marketplace	
Products are stolen	
Buyers only want to buy on credit	
Buyers refuse to pay after they bought on credit	

*Pensioners'market (pension), Roadside stall (roadside), Informal market in town (town), Municipal market (munic), Other (specify).

10.8 Which marketing channels are you mostly satisfied with? **(Tick where appropriate)**

Market channels for:	**Yes**	**No**	**Do not know**
Maize			
Sugar cane			
Potatoes			
Sweet potatoes			
Dry beans			
Madumbis			
Groundnuts			
Green vegetables			
Timber			
Cabbage			
Tomatoes			

10.9 What would help you to sell more of your produce?

1. ---------- ----------

2. ---------- ----------

3. ---------- ----------

4. ---------- ----------

10.10 What do you think your local and national authorities could do to help you improve your marketing?

Solutions	**1**	**2**
GOVERNMENT ----------		

TRIBAL AUTHORITY ----------		

10.11 What type of cooperation do you have with large commercial farmers in your area? (Tick where appropriate)

Cooperation	**Yes**
Production advice	
Marketing advice	
Tractor and ploughing services	
Pest control	
Part- time work	
Transport services	
Other (specify)	

10.12 If "no", would you like to have any? ---------- Yes/No

10.13 Contract (Marketing) disputes

10.13.1 Have you or your family ever had a dispute with a buyer over a marketing (sale) contract
----------Yes/No

- If "yes", what was the dispute over?

Conflict source	**Yes/No**	**Dispute with***	**Settled/resolved by:****
Quantity agreed upon			
Price agreed upon			
Quality agreed upon			
Time agreed upon			
Method of payment			
Other **(specify)**			

*Dispute with: Neighbour (neigh), Shopkeeper (shopk), Miller (miller), Hawker (hawk), Other (specify).

**Resolved by: Themselves (selves), Tribal councillors (council), Magistrate (magist), Government official (official).

10.13.2 Do you know of anyone in the last 2-3 years who has appeared in court for not respecting a marketing contract?
----------Yes/No

10.13.3 Was it at a tribal court or magistrates court ----------Tribal/Magist.

SECTION 11: EXTENSION

11.1 Can you get farming information when you need it? ----------Yes/No

If "**yes**", where do you get it from? ----------

11.2 What is the agricultural extension officer's name? ----------

11.3 How many times did the extension officer make contact with you or another member of your household during the past 3 months? ----------Visits

11.4 How many times did your family contact an extension officer during the past 3 months? ----------Contacts

11.5 Were any of the following training courses offered in this area during the past year?

Course	**Yes or No**	**Course offered by?***	**Did any member of your family attend?** (Yes or No)
Marketing skills			
Livestock or poultry			
Crops, fruits or pastures			
Soil conservation			
Farm budgeting			
Planning of production			
Other (**specify**)			

*Government (**govern**), Other (specify)

11.6 What type of agricultural training would you like to receive?

1. ----------

2. ----------

3. ----------

11.7 How far are you to the nearest tar road? ----------Km

11.8 How far are you to nearest main gravel road? ----------Km

11.9 Does any household member currently belong to a farmers' cooperative, farmers' association or garden club? ----------Yes/No

SECTION 12: GENERAL PROFILE

12.1. MAIN REASON FOR KEEPING THIS LAND(please rank)

Reason	**1**	**2**
Commercial agriculture		
Subsistence agriculture		
Both commercial and subsistence		
Residential		
Grazing		
Social security		
Non-agricultural activities		

12.2 Do you know that you can borrow money from the bank or other institutions if you want to?

----------Yes/No

SUPPLEMENTARY HOUSEHOLD QUESTIONNAIRE

1.Where do you buy your foodstuffs (cabbage, spinach, mealies, etc.), if not self-produced? (**Tick where appropriate**)

- Neighbours ----------
- Commercial farmers ----------
- In town (Wartburg, PMB, Pinetown, Durban) ----------
- Other (**specify**) ----------

APPENDIX 2

TRANSACTION COST DIMENSIONS IN THE TWO STUDY REGIONS

Table A2.1 Transaction Cost Dimensions in Swayimana (n =100)

Components	Eigen v.	X_1	X_2	X_3	X_4	X_5	X_6
Distance	2.044	**0.950**	**0.952**	0.010	0.388	0.152	0.228
Assets	1.241	0.005	0.004	0.773	**0.380**	0.002	**0.703**
Information	1.122	0.200	0.211	0.003	**0.532**	**0.840**	0.219

The first component, representing the overall distance, with Eigen value of 2.044, accounted for 34 per cent of the variation in transaction costs. The first two components accounted for 54.7 per cent, the three components for 73.4 per cent.

Table A2.2 Transaction Cost Dimensions in Impendle (n =120)

Component	Eigen v.	X_1	X_2	X_3	X_4	X_5	X_6
Assets	1.491	**0.589**	0.100	**0.647**	0.195	0.060	**0.822**
Distance	1.200	**0.411**	**0.817**	0.264	**0.519**	-0.145	0.050
Education	1.123	**0.431**	0.010	**0.397**	-0.294	0.832	-0.010
Status	0.935	0.060	0.350	**0.315**	**0.752**	**0.378**	0.050

The first component, with 1.491 Eigen value, accounted for 24.8 per cent of the variation in transaction costs. The first two components (i.e information and distance) accounted for 44.8 per cent, the four components for 79.1 per cent.

2. Where do you expect to get better quality foodstuffs? (**Please rank**)

Option	**1**	**2**	**3**
Neighbours			
Commercial farmers			
In town			
Own production			

3. Do you like to buy foodstuffs and other items from people you personnaly know or do not know?

KNOW----------Yes/No

DON'T KNOW----------Yes/No

4. Do you like living next to your field (land) crop? ----------Yes/No

If not, Why?

---

5. If you want to borrow money, where would you go? (**Tick where appropriate**)

- Bank ----------
- Government lenders (KFC, etc.) ----------
- Private lenders ----------
- Neighbours ----------
- Relatives or Friends ----------

APPENDIX 3

Block-Recursive Model Syntax

Step # 1 Ordinary Least Squares (OLS)

Dependent variable = **LMKTMETHODS** = f {Ageh; Acc; Elec; Coop; Distra; Land; D-ratio; (District) }

RUN

Step # 2 Two-Stages-Least squares (2SLS)

Dependent variable = **CROPINCOM** = f (Lmktmethods; Croparea; Liquidity; Hsize; D-ratio; Visits; District)

INSTRUMENTAL VARIABLES

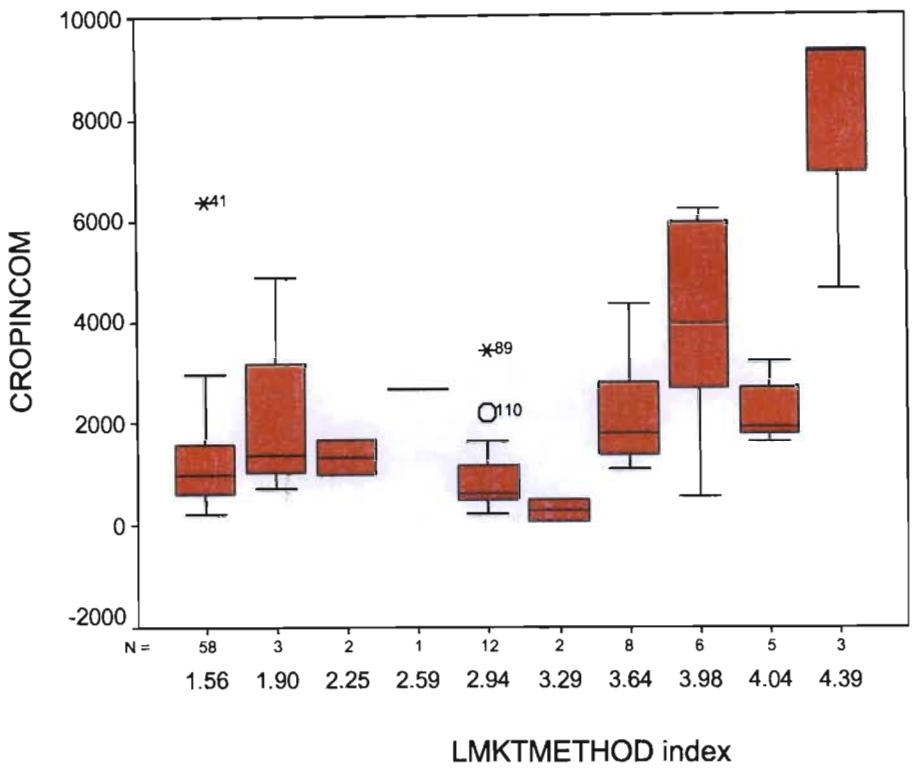
Ageh; Acc; Land; Distra; Elec; D-ratio; Coop; (District); Visits;

Croparea; Liquidity; Hsize; District.

RUN

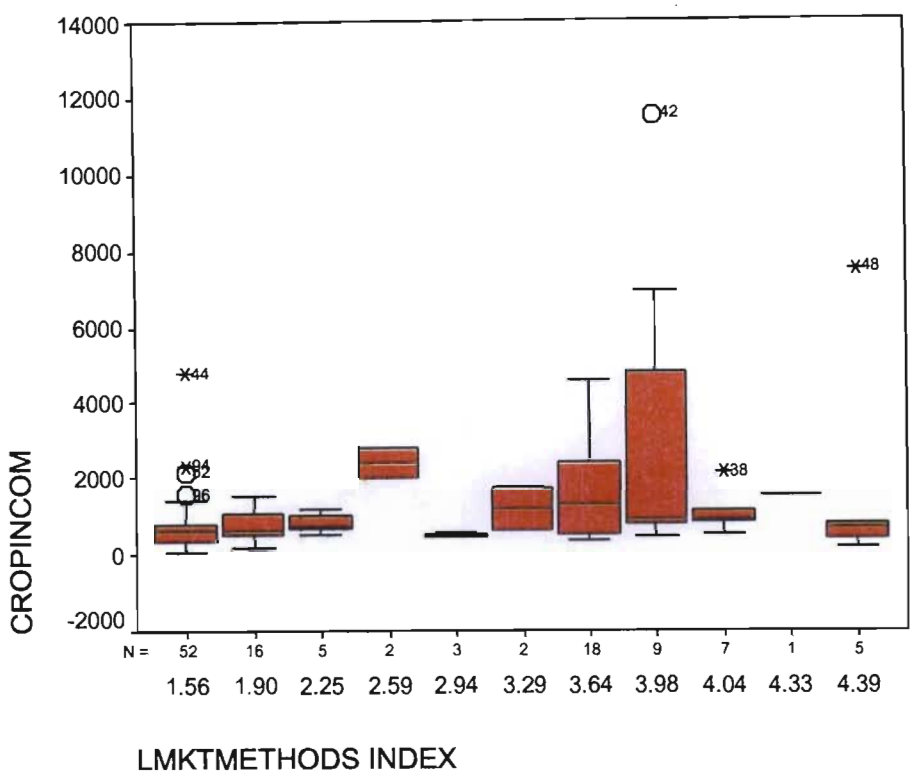
APPENDIX 4

Figure A4.1 Boxplot of crop income and index scores for Swayimana (n =100)



From these plots, it can be seen that Swayimana farmers with market methods scores of 1.90 (n = 3) and 2.25 (n = 2) have similar distributions for crop income although those with a 1.90 score have several extreme values. Since only one farmer scored 2.59, there is no variability. The last four groups have much higher median crop incomes than other groups, with the three farmers who scored the highest (4.39) having the highest median of crop income. Results confirm expected results of the income equation whereby farmers with higher market method index scores, implicitly facing lower transaction costs, are expected to yield a higher crop income.

Figure A 4.2 Boxplot of crop income and index scores for Impendle sample (n =120)



NOTE ABOUT BOXPLOTS

The lower boundary of each box is the 25th percentile and the upper boundary is the 75th percentile. The horizontal line inside the box represents the median. Fifty percent of the cases have values within the box. The length of the box corresponds to the interquartile range, which is the difference between the 75th and 25th percentiles. The boxplot includes two categories of cases with outlying values. Cases with values that are more than 3 box-lengths from the upper or lower edge of the box are called extreme values. On the boxplot, these are designated with an asterisk (*). Cases with values that are between 1.5 and 3 box-lengths from the upper or lower edge of the box are called outliers and are designated with a circle. The largest and smallest observed values that are not outliers are also shown. Lines are drawn from the ends of the box to these values. From the median, the central tendency, or location can be determined. From the length of the box, the spread, or variability, of the observations can be determined. If the median is not in the centre of the box, then the observed values are skewed. If the median is closer to the bottom of the box than the top, the data are positively skewed. If it is closer to the top, the opposite is true: the distribution is negatively skewed. Boxplots are particularly useful for comparing the distribution of values in several groups (SPSS Inc, 1993).

APPENDIX 5

FARMERS' REACTIONS ABOUT STUDIES CONDUCTED IN THEIR AREAS.

-- We have seen people coming here to ask us questions, but never heard from them once they leave. Is your research one of those too?

-- We really need some kind of help to find new markets for our produce. Most of the time we don't know what to do after we have produced.

-- We would really appreciate if you can do something for us as far as improving our marketing situation is concerned.

-- We would like to get a space here, so that we can use it as a public fresh produce market. Everyone could bring whatever he/she has to sell, at least twice a week. Once this place is known throughout the region, middlemen from town can come here.

-- What is discouraging is the fact that some people around here are so lazy to farm, that they resort to stealing fresh produce straight from the fields of those who are farming. We need strong and tough laws against those criminals, once apprehended.

-- My allocated plot of land is too small given all the mouths to feed in this family. With some extra land, maybe I can plant more and sell the surplus.

-- I hope that your research project is not from the government, because those folks come here with all the promises which they cannot keep. We will be very happy if you can come up with some practical solutions to our marketing problems.

-- There is no money in farming. It is better and easier to work in town.

-- There is a lot of competition around here, since everyone is selling the same product(s).

-- We need money so that we can plough the entire allocated land and afford to buy all the inputs.

-- The soil in Impendle is very poor. You need a lot of fertilizer or lime if you want to get a better result. And this requires a lot of money for inputs, which we don't have.

-- We cannot compete with commercial farmers around here (Swayimana), since they plant the same crops as us and which they can afford to sell at very cheap prices within our area. These people want to undermine us. They don't want us to succeed.

-- Many farmers here lack vision and private initiative. They do not have the sense of business. In short, I can say that they are lazy. They expect the government to help them with everything.