



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

Papers downloaded from AgEcon Search may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Agricultural cooperatives II: Can they facilitate access of small-scale farmers in South Africa to input and product markets?

GF Ortmann¹ & RP King²

Abstract

The objective of this research is to investigate whether agricultural cooperatives can facilitate smallholder farmer access to input and product markets. Farmers in two case study communal areas of KwaZulu-Natal face high transaction costs as reflected primarily in their low levels of education and literacy, lack of market information, insecure property rights, poor road and communication infrastructure, and long distances to markets. Analysis of the reasons why cooperatives were originally established in various parts of the world suggests that most of the causes (such as poverty, market failure and high transaction costs) also apply to the study farmers, as do the seven international principles of cooperation. Smallholder farmers in both case study regions have the potential to grow high-value crops such as vegetables, fruit and cut flowers. In the supply chain from farm to market, the optimum boundary for each organization involved in the chain (e.g. cooperative and investor-oriented firm) depends on the minimum operational and transaction costs for each business.

Keywords: Agricultural cooperatives; small-scale farmers; high-value crops; transaction costs; South Africa

1. Introduction

South African (SA) agriculture is of a dual nature, with a well-developed commercial sector comprising about 46,000 commercial farmers occupying 86% of agricultural land, while small-scale communal farmers occupy the remaining 14% of farmland (NDA, 2005). Since the early 20th century agricultural cooperatives have played an important role in the development of the commercial agricultural sector in South Africa. With government's support for commercial farmers (e.g. through subsidized interest rates, tax concessions,

¹ Professor of Agricultural Economics, School of Agricultural Sciences and Agribusiness, University of KwaZulu-Natal, Private Bag X01, Scottsville 32009, South Africa. E-mail: ortmann@ukzn.ac.za.

² Professor and Head, Department of Applied Economics, University of Minnesota, 231e Classroom Office Building, 1994 Buford Avenue, St Paul, Minnesota 55108, USA.

and price supports), cooperatives have served commercial agriculture as suppliers of inputs to farmers (e.g. seed, fertilizer, chemicals, fuel, and credit), as marketing agents of their commodities through various marketing (control) boards, and as providers of services (e.g. grain storage and transport). Small-scale farmers in South Africa did not have access to the services of these cooperatives under the previous (apartheid) government's policies, which restricted black farmers' activities to the former homelands.

Since the election of a democratic government in 1994 and the subsequent elimination of government support for commercial farmers and their cooperatives, several of these cooperatives have converted to investor-oriented firms (IOFs). These cooperatives had lost considerable business because they could no longer serve as agents (regional monopolists) for government marketing boards, which were abolished in the 1990s (Piesse *et al.*, 2003). Increasing pressure on cooperatives to become more efficient and the problems inherent in conventional cooperatives (such as free-rider, horizontal and portfolio problems (Cook, 1995)) may have also played a role in the decision to convert to IOFs. Despite the conversion, the present SA government is promoting the use of cooperatives as organizations that could help enhance the development of small-scale farmers and other communities in South Africa. A new Cooperatives Act (No 14 of 2005), based on international cooperative principles, was signed into law by the SA government in August 2005 (RSA, 2005).

The objective of this paper is to research the question of whether conventional cooperatives, or other cooperative organizational forms, are the appropriate vehicle to reduce transaction costs and facilitate access of small-scale farmers in South Africa to input and product markets that could promote their development. Small-scale farmers in South Africa, as in other developing countries, have limited access to factors of production, credit and information; and markets are often constrained by inadequate property rights and high transaction costs (Lyne, 1996; Matungul *et al.*, 2001). High transaction costs - including the costs of information and the costs associated with the search for trade partners, the distance to formal markets and contract enforcement - are detrimental to the efficient operation of markets for inputs and products (Williamson, 1985). Institutional arrangements, such as vertical coordination (e.g. through contract farming) and horizontal coordination (through producer groups such as cooperatives), may help to reduce the relatively high transaction costs smallholders face and may help them to overcome access barriers to production resources, information, services and markets for high-value products (Delgado, 1999; Holloway *et al.*, 2000). With Kirsten and Sartorius (2002) providing an in-depth study of contract farming, this study

focuses on the appropriateness of cooperatives in reducing transaction costs for smallholder farmers and facilitating their access to input and product markets.

The paper is organized as follows: The next section presents the characteristics of small-scale farmers in two case study communal areas of KwaZulu-Natal, with particular emphasis on the constraints they face in gaining access to input and product markets. This is followed by a discussion of some potential benefits of cooperation among producers. Section 4 considers the appropriateness of cooperatives for smallholder farmers in the two study areas of KwaZulu-Natal, considering the causes of cooperative failures in the less-developed areas of South Africa and the conditions for successful cooperation. In section 5 the issue of determining the efficient (optimum) boundaries of organizations involved in a product supply chain (e.g. cooperatives and IOFs) is presented. The paper concludes with a discussion and some policy recommendations.

2. Characteristics of small-scale farmers in South Africa

Although small-scale farmers in the communal areas of South Africa have limited access to resources, including credit and information, and markets are often constrained by inadequate property rights and high transaction costs (Lyne, 1996), some smallholder farmers have managed to produce food for own consumption and for the market. For example, in two communal areas of the province of KwaZulu-Natal (Impendle and Swayimana) farmers normally sell their produce through informal channels such as neighbours, local shops and monthly pension markets (Matungul *et al.*, 2001). The study by Matungul *et al.* (2001) is used here as an example to demonstrate typical smallholder household characteristics in two rural areas of the KwaZulu-Natal midlands. The authors attempted to identify market constraints faced by a random sample of 120 farmers (households) in each of two communal areas. Impendle lies southwest and Swayimana northeast of Pietermaritzburg, the capital city of KwaZulu-Natal. Swayimana, where rainfall exceeds 1000mm per year, is the more fertile area of the two regions, has a longer growing season and no frost. In Impendle, where annual rainfall varies between 800 and 1500mm, soil is of a lower quality and land is used primarily for livestock husbandry, with arable areas used mainly for potato and maize production. While vegetables grow well in both regions, deciduous fruit are suitable for Impendle and subtropical fruits thrive at Swayimana (Lyne, 2005). Residents in the two regions share the same institutions (formal and informal), which implies that households in each area would show similar marketing behaviour with relatively small variability in food crops produced and constraints faced. Table

A1 in Appendix 1 highlights important demographic characteristics of the respondents (household heads) and variables that affect the level of transaction costs they face. High transaction costs prevent markets (e.g. for inputs, products and credit) from operating efficiently.

Agriculture in the two regions is mostly rain-fed with some gravitational irrigation systems supporting vegetable production. The average size of sample households over both study areas is 6.7 members. Allocated plots of arable land are quite small in both regions (1.1 hectares in Impendle and 1.8 hectares in Swayimana). Land allocation and responsibility over it lie with the tribal authority, the Inkosi (chief) and his Indunas (foremen), thus no household can claim formal ownership of the allocated piece of land. There is, therefore, no market for arable land under the existing land tenure system. This implies that there is no real incentive to improve land and that a small farmer will not qualify for farm credit using land as collateral. The majority of household heads in both areas are male. However, marketing of agricultural products and other related activities is undertaken mainly by female members of the households. Men are more involved in non-agricultural activities (e.g. brick making and car repairs). Extension officers only visit respondents (household heads) about once a year. Education levels of respondents in both study areas are generally low (mean of 5.2 years), and only 36% of all respondents speak English (32.5% speak and write English). This implies that respondents in both areas face high transaction costs (in terms of costly arrangements) in marketing their products outside of their own areas.

Households usually have two or more extended family residents and some adult members away on wage employment in nearby towns. Household income is derived mainly from off-farm sources (i.e. welfare payments, wage remittances, and from such activities as brick-making, car repairs and beer sales), and sales of livestock and traditional staple food crops (i.e. maize, amadhumbe (a traditional vegetable tuber), potatoes, beans and various green vegetables). Household crop income for the study year averaged R1183 in Impendle and R1416 in Swayimana. Food crop production is an important activity in both areas, with maize being the staple diet of most residents.

Although markets for the food crops exist within each region, most respondents expressed the need for additional marketing outlets for their produce. From a transport perspective, Swayimana producers have an advantage in reaching markets for high-value products in that they are closer to the larger markets of Pietermaritzburg (about 65km, compared to 85 km for Impendle producers) and Durban (about 80km, compared to 160 km). The nearest larger town for Impendle producers is Howick (50km), and for

Swayimana producers it is Wartburg (25km). Swayimana households also have larger allocations of cropland (1.8 hectares average compared to 1.1 hectares), a larger proportion of households with own transport (37.5% vs. 27.5%), household heads have slightly better education levels (5.6 years vs. 4.8), and a greater proportion of them speak English (40% vs. 32.5%). However, physical infrastructure (roads, telecommunications, transport) in both regions is poorly developed (e.g. most roads are of poor quality and in need of repair and upgrading), and the institutional environment (communication skills, contract enforcement) in the two regions is also weak. Small-scale farmers generally lack market information. Although public transport (usually taxis) is available throughout the two regions, it is not always adequate for transporting crops to markets or inputs back to the household. Homesteads are also geographically dispersed and some residents have to walk long distances to the nearest road served by public transport vehicles.

Relative to the size of both study areas, the number of market centres is low or nonexistent. No formal marketing contracts were signed in either study area; however, some informal arrangements, mainly between friends, were mentioned under which exchanges or sales of crops occurred. The volume of crop sales is often low (which may discourage private sector service provision), and with no legal right to ownership of land, there is neither the ability nor the incentive to rent unused arable land and invest in improvements so as to increase the volume of business. Clearly, high transaction costs in the production and marketing of otherwise profitable commodities often exclude small-scale farmers from participating in growth opportunities. The empirical study by Matungul *et al.* (2001) supports the hypothesis that transaction costs are a primary determinant of household crop income; i.e. households facing lower transaction costs generate higher levels of crop income. The area of cultivated arable land and off-farm income (which provides the liquidity necessary for purchasing inputs and contractor services) also had a positive impact on households' level of crop income.

Therefore, in addition to public investments in improved physical infrastructure (roads, telecommunications), institutional infrastructure (e.g. land rental markets, marketing associations, contract enforcement) is critical for lowering transaction costs for sample households, which could stimulate their production and marketing activities. Matungul *et al.* (2001) contend that the government has an essential role to play in establishing an institutional framework (rules and constraints) for creating sustainable marketing systems and that government could bear some of the costs of coordinating collective action. Group action by smallholders could strengthen their bargaining power,

facilitate finding institutional solutions to problems of coordination and public service provision, compensate for missing markets and reduce transaction costs.

3. Cooperation among producers

Holloway *et al.* (2000) suggest that producer cooperatives are useful in overcoming access barriers to assets, information, services and markets for high-value products. They studied milk marketing of small-scale farmers in the east-African highlands and concluded that cooperative selling institutions are potential catalysts for reducing transaction costs, stimulating entry into the market and promoting growth in rural communities. Reardon and Barrett (2000) argue that the increasing importance and changing nature of food grades and standards is a reason for the rise of cooperatives and contract farming in developing countries, particularly for perishables such as horticultural, meat, dairy and fish products. Applying grades and standards requires investments in training, equipment, infrastructure and monitoring systems, which may only be afforded by larger organizations. However, conventional cooperatives often do not invest in long-term assets (improvements) or in intangible assets (such as training and research) due to the "horizon" problem (Cook, 1995). Forming new generation cooperatives may solve this problem if delivery rights and obligations of members can be enforced. Other problems inherent in conventional cooperatives, including free-rider, portfolio, control and influence cost problems (Cook, 1995), may also create disadvantages for members of these cooperatives (these problems were discussed in detail in a previous article (Ortmann & King, 2007)).

Despite these potential problems, Roets (2004) recommends the use of cooperatives to facilitate the marketing of goats by small-scale (communal) farmers in South Africa. Most of these farmers have small goat herds (10 – 20 animals). This increase the transaction costs for individual farmers, since selling one animal often involves the same effort as selling 10 or more. Also, specialized (expensive) inputs may be required to better manage and sell animals (e.g. medicines, ear tags, tools, animal brand registration, transport facilities and holding pens). Collective action of goat farmer cooperatives can provide these services and inputs cheaper than farmers can acquire them individually. Roets (2004:214) also contends that cooperatives are a culturally acceptable business form to small-scale farmers because they work on similar principles as "stokvels" and burial societies with which these farmers are already familiar.

In view of the advantages and disadvantages of conventional cooperatives and the fact that the SA government is promoting the establishment of cooperatives among rural communities, the appropriateness of cooperatives for the case study farmers in KwaZulu-Natal will be further analyzed.

4. Appropriateness of cooperatives for smallholder farmers in KwaZulu-Natal

To investigate the appropriateness of the cooperative organizational form for small-scale farmers in the two communal areas of KwaZulu-Natal, it is helpful to consider the reasons why cooperatives have been established elsewhere and the extent to which these conditions also apply to the KwaZulu-Natal farmers. Twenty-eight Rochdale pioneers in England initially formed the Rochdale Society in 1844 because of extreme poverty in their community at the time and dissatisfaction with retail shopkeepers in their area (Barton, 1989). Strength of leadership, motivation and enthusiasm played a major role in establishing this form of organization.

Other reasons for the formation of farming cooperatives include: market failure (due to costly information and transaction costs), promotion of self-help, a desire to enhance bargaining strength with input suppliers and buyers of farm products, operation at cost (including normal return for capital invested), income enhancement, reduction of transaction costs with trading partners, provision of missing services (e.g. input and/or product marketing), assurance of input supplies and/or product markets (particularly for perishable crops like vegetables and fruit), coordination of the flow of input supplies and farm products to markets, reduce opportunistic behaviour by potential competitors, gain economies of size advantages (e.g. in providing inputs and/or marketing services to members, or with a plant), public policy (e.g. support of government), and promoting community development in general (see Schrader, 1989; Barton 2000; Fulton & Ketilson, 1992; NCBA, 2005; NCFC, 2005). Table 1 summarizes the main reasons for the initial formation of farmer cooperatives and to what extent these also apply to the case study farmers in KwaZulu-Natal.

Table 1 suggests that most of the reasons why cooperatives formed in the first place also apply to the small-scale farmers in the study area. They are faced with considerable poverty challenges and high transaction costs (leading to market failure). Benefits could flow through improved incomes to members if a cooperative organization were well managed and supported so as to achieve some of the outcomes listed in Table 1. There is uncertainty at present about the strength of leadership, motivation and enthusiasm for cooperatives in the

communities, but this will only be determined once community leaders are informed about the benefits and costs of forming a cooperative. Desire to improve the quality and safety of products and government's promotion of cooperatives may also be catalysts for the formation of cooperatives.

Table 1: Main reasons for the initial formation of agricultural cooperatives and their applicability to smallholders in two communal areas of KwaZulu-Natal, South Africa

Reasons for initial formation of agricultural cooperatives	Applicable to KwaZulu-Natal case study farmers? (Yes / No / Uncertain)
Poverty	Yes
Market failure (costly information, transaction costs)	Yes
Provide missing services (input and/or marketing)	Yes
Drive for self-help	Yes
Operate at cost	Yes
Improve farmers' (members') income	Yes
Enhance bargaining strength	Yes
Reduce transaction costs with traders	Yes
Assure input supplies and/or product markets	Yes
Coordinate flow of input supplies and farm products	Yes
Community development	Yes
Support of government	Yes
Strength of community leadership, motivation	Uncertain
Benefit from economies of size (in providing inputs/marketing services)	Uncertain
Reduce opportunistic behaviour	No (not at this stage)

To further answer the "appropriateness" question, it is also important to consider whether the seven international principles of cooperation (ICA, 2005) would apply to, and likely be accepted by, smallholders in the study areas. Table 2 summarizes these principles, their likely applicability and acceptability, and some corresponding comments.

Table 2: International (ICA) cooperative principles and their likely applicability to, and acceptability by, smallholders in the KwaZulu-Natal study areas

International Cooperative Principles*	Applicability and likely Acceptability	Comments
Voluntary and open membership	Yes	Community structures would most likely support this principle. However, members must also accept the responsibilities of membership.
Democratic member control	Yes	However, principal-agent problems may arise if the manager or directors do not consult with and inform members on a regular basis. This may be a particular problem if traditional leaders, with their authority, take over the leadership of the cooperative. Members should actively participate in setting policies, making decisions, and electing their representatives. They have equal voting rights in conventional (primary) cooperatives (one member, one vote).
Member economic participation	Yes	Members contribute equitably to, and democratically control, the capital of their cooperative. This will most likely be acceptable for members of an emerging cooperative in a less-developed area where the wealth differences between members is relatively small (as in the case study example). However, as the cooperative develops and members' wealth differences grow (assuming better access to land, operating inputs and markets), there may be more pressure on the cooperative to convert to a new generation cooperative or an IOF where benefits are proportional to the investment in the organization.
Autonomy and independence	Yes	This is a critical issue. Cooperatives must not become government agencies as happened in several developing countries in the past. The SA government, although supportive of cooperatives, has stressed that they should remain autonomous and independent (RSA, 2005).
Provision of education, training and information	Yes	However, new and small (emerging) cooperatives will most likely not be able to appoint staff to provide this service, but they could invite extension agents, NGOs, or DTI personnel on a regular basis and coordinate education and training sessions for members, managers, directors, and employees. The SA Primary Agriculture Education and Training Authority (PAETA) could provide funding for some education and training sessions (Roets, 2004).
Cooperation among cooperatives	Yes	This would be an opportunity for emerging cooperatives to tap the expertise and experiences of established, successful cooperatives. The latter could serve as mentors until the new cooperative is fully established. Once established, emerging cooperatives could continue their association with successful cooperatives in terms of training, input buying and product marketing opportunities. Nilsson (as cited by Van Dijk & Werts, 1996) contends that cooperatives, like other businesses, should collaborate with the best partners, not necessarily with other cooperatives.
Concern for the community	Yes	Smallholders in less-developed areas operate in an institutional environment that is community-oriented. Cooperatives could reinforce this environment and work towards the sustainable development of their communities (e.g. see Fulton & Ketilson, 1992).

*Source: ICA (2005)

Proponents and potential leaders of cooperatives should also be aware of the weaknesses inherent in conventional cooperatives (Cook, 1995; Ortmann and King, 2007). The question is to what extent these weaknesses would constrain the establishment and development of cooperatives in the less-developed areas of South Africa, and particularly in the case study areas. Table 3 summarizes these inherent weaknesses and to what extent they would apply to emerging cooperatives in the study areas.

The information in Table 3 suggests that a conventional cooperative established in the study area would face free-rider, horizon and portfolio problems. These potential constraints may cause insurmountable problems initially, as the cooperative is established and members of similar wealth try to make it work. But they could constrain investments in, and growth of, the cooperative in the future as members' businesses grow, and wealth and patronage levels among members change. Control and influence cost problems could also emerge as the cooperative grows and expands its membership and activities. Proponents and potential leaders of cooperatives in less-developed areas should be aware of these problems and their likely impacts on cooperative growth before they motivate for the establishment of such an organization. They should also keep an open mind about the growth cycle of cooperatives (i.e. from the formation of a conventional cooperative to its eventual dissolution or conversion into another organizational form (Cook, 1995)), and that members may later pressure managers and directors to convert their cooperative into an ownership form that may be more efficient, such as a new generation cooperative or an IOF (if delivery obligations could be enforced).

In addition to the real and potential problems inherent in conventional cooperatives, causes of cooperative failures in less-developed areas of South Africa also need to be closely studied in order to avoid similar pitfalls in future.

Table 3: Inherent weaknesses of conventional cooperatives and their likely applicability to emerging cooperatives in KwaZulu-Natal

Inherent Weakness	Applicability	Comments*
Free-rider (common property) problem	Not initially, but later	Conventional cooperatives usually have a large amount of collective capital (common property) derived mainly from retained earnings accumulated over time. Initial membership fees (equity shares) at the establishment of a cooperative will likely be the same for all members, and these equity shares (property rights) are usually not tradable. However, since rights to residual claims (net profit) are linked to patronage instead of investment, new members joining later receive the same benefits as existing members although they are not required to make initial investments proportionate to their use of the cooperative; i.e. new members get immediate access to all the assets of the cooperative.
Horizon problem	Yes	The benefits members receive from their investments in the cooperative are limited to the time period over which they expect to patronize the cooperative. As young and older members have different planning horizons, the cooperative will not make the best investments; e.g. it will tend to under-invest in assets with long-term payoffs, and managers and directors will be under pressure to increase equity redemptions at the expense of retained earnings (which could have been used to invest in additional assets).
Portfolio problem	Yes	Equity shares in a conventional cooperative cannot generally be freely traded so that members are unable to diversify their individual investment portfolios according to their personal wealth and risk preferences. It is, therefore, impossible for cooperative managers and directors to make investments in the interests of all members.
Control problem	Uncertain	A divergence of interests between cooperative members (principals) and managers (agents) gives rise to control problems. The challenge is to establish incentive mechanisms for managers that will align their interests with those of the members. This may not be a major problem in small cooperatives with a relatively homogeneous membership (in terms of members' interests) and focused (specialized) activities (e.g. sale of vegetables), which may apply to the case study example.
Influence cost problem	Not initially, but possibly later	This problem can arise in a cooperative with a wide range of activities and thus diverse objectives of its members. Members may try to influence managers' decisions, which could result in costly misallocations of resources. This problem may not apply to the case study farmers whose objectives and interests may not be very diverse, at least initially.

*Based on Cook (1995), Nilsson (as cited by Van Dijk & Werts, 1996), Iliopoulos & Cook (1999) and Royer (1999)

4.1 Causes of cooperative failures in less-developed areas of South Africa

Agricultural cooperatives serving smallholders in the less-developed rural areas of South Africa have generally not been successful in promoting agricultural development and members' economic welfare. Van der Walt's (2005) study on cooperative failures in Limpopo province indicated that poor management, lack of training, conflict among members (due mainly to poor service delivery), and lack of funds were important contributory factors. Machethe (1990) interviewed members of six agricultural cooperatives in a former homeland of South Africa to determine the causes of the poor performance or failures of these cooperatives. He summarized the major causes as follows:

- Members' lack of identity with their cooperatives
- Members' lack of understanding of their cooperatives' role
- Failure of cooperatives to involve members in policy decision-making
- Failure of cooperatives to compete with other businesses
- Inability of members to dismiss inefficient management
- Failure of cooperatives to provide transport for delivery of members' purchases
- Inability of cooperatives to keep adequate stocks of farming inputs
- Inability of cooperatives to provide sufficient credit
- Subsistence nature of agriculture

Of the respondents, nearly 60% indicated that they had joined a cooperative so that they could purchase goods on credit (24%), to sell produce through the cooperative (22.5%), and on advice of the local agricultural extension officer (12.5%). Only 41% understood cooperatives to be owned by members, 22.5% indicated that they did not know who the owner was, while 19% thought the cooperative belonged to the chief. About 26% of respondents indicated there was no difference between a cooperative and another business undertaking, 19% did not know of a difference, while only 11% indicated that the main difference is due to the cooperative being owned by its members. These responses clearly suggest that many members do not understand what a cooperative is and what its objectives are. Also, about 48% of members were buying goods from local shops, which undermined the cooperatives' income. Main reasons given were that the cooperatives did not carry all items (23%) and that local shops' prices were lower (16%). Thus, it appears that the sample of cooperatives did not compete effectively with local shops which weakened their financial position. Also, 61% of respondents felt that they had little or no influence on the policies of their cooperatives. This may indicate an authoritative style of management where decisions are often taken without

member participation or consultation (a principal-agent problem). Members also felt powerless to change management or were unaware that they had the power to do so (Machethe, 1990).

The study responses suggest that cooperative members did not clearly understand the purpose of a cooperative, how it functions, and what members' rights are. This could stem from their relative lack of education and training or from ignorance (due to inadequate information). This situation may also apply to the case study farmers (described in section 2) who are constrained by relatively poor education, lack of access to information, and infrequent contacts with their local extension officers (who also may not understand the cooperative concept because of limited exposure to it). It should also be recognized that external factors, such as uncertain property rights (e.g. to land, and uncertainty whether land rental contracts will be upheld in traditional courts), poor road and communication infrastructure, and poor access to input (e.g. credit, hybrid seed, fertilizer) and product markets, also play a crucial role in the poor performance of cooperatives in the less-developed areas of South Africa. These constraints need to be addressed as well if cooperatives are to play a promotional role in rural development.

4.2 Conditions for successful cooperation in less-developed areas of South Africa

Strategies that will help to overcome the causes of cooperative failures in the developing areas of South Africa and improve the likelihood of establishing and operating successful cooperatives, with particular reference to the case study farmers, are presented in this section. Both external and internal factors will be considered.

4.2.1 External factors

According to the Department of Trade and Industry (DTI, 2003), poverty among rural people is caused by inadequate access to resources (such as land, capital and infrastructure) and the poor availability of social services (e.g. education, health and housing). A necessary, but not sufficient, condition for the development of rural areas is for the government to play a proactive role in creating a legal, economic, administrative and institutional environment that will help promote private initiatives, such as the formation of credit unions (i.e. savings and credit cooperatives, which could mobilize capital) and agricultural cooperatives, which could be successful in areas where smallholder farmers produce surplus crops or livestock for sale and require modern agricultural inputs. The government has committed itself to creating a

favourable environment for cooperative development (DTI, 2004:12). In particular, government should focus its relatively scarce resources on providing physical and legal infrastructure to reduce transaction costs, including risk, so that markets for products and resources (such as land) work more efficiently. Improvements in physical infrastructure, such as roads and telecommunication facilities, would help to reduce transport and communication costs for farmers and traders and would improve access to inputs such as hybrid seed, fertilizer and chemicals, while access to product markets may also be enhanced. Legal infrastructure includes independent and respected courts that enforce private property rights, uphold contracts and minimize uncertainty in business transactions. Clearly, cooperatives will also benefit if they can enter into contracts that are enforceable by independent courts.

Another challenge in establishing cooperatives is how to promote knowledge of cooperatives among potential members and trading partners. Both government and the private sector may play a role in this regard. Government initiatives could involve engaging well-trained extension officers, at both provincial and national level, and DTI staff in training and advising potential cooperative members in various districts. Private initiatives may involve NGOs (which could be contracted by government to inform and train potential members on establishing and managing cooperatives), established cooperatives³, and possibly processors and marketers (buying agents) involved in supply chains of high-value products (e.g. vegetables, fruit, cut flowers), who could benefit from doing business with cooperatives rather than with many smallholders. Essential for promoting cooperatives among potential members is the availability of venues and opportunities for them to convene to discuss the benefits and formation of cooperatives.

Limited access to capital for smallholder farmers and small businesses is a major constraint to rural development in South Africa, including the formation of cooperatives. Smallholders often have to rely on informal lenders such as friends and family and rural or township lenders to meet their financing needs (Schoombe, 1998, 1999; as cited by Kuhn, 2003:79). Commercial banks have been hesitant to provide credit to smallholders and small entrepreneurs due to the high risks associated with lending to them. These risks are due to insufficient or absent collateral (due to poorly defined property rights and low wealth levels), poor financial record-keeping, and high transaction costs involved in granting small loans (Coetzee & Vink, 1991; as cited by Kuhn,

³ In November 2005 there were about 57 farmer cooperatives in KwaZulu-Natal (Mthembu, 2005), but no vegetable cooperatives in the study areas.

2003:79). The SA government launched various initiatives from the mid-1970s to promote access to credit for low-income producers, generally with limited success (Kuhn, 2003:80-84). Various financing models and initiatives have since been suggested, with some government role in reducing credit market failures (Kuhn, 2003:84-89). Development finance institutions, such as the Land and Agricultural Bank (a government parastatal), Ithala Bank, African Bank and Umthombo Agricultural Finance (for small-scale sugar farmers), have in recent years been relatively successful in extending credit to small-scale entrepreneurs (Kuhn, 2003:89), and could play a role in providing credit to potential members and "seed capital" for establishing cooperatives.

4.2.2 *Internal factors*

Given the external factors influencing the success or otherwise of cooperatives, several of the internal factors discussed here to improve the performance of cooperatives in developing regions depend on educating and training potential cooperative members, and enhancing their knowledge of cooperative principles and members' rights. The education function and responsibility will most likely fall on a well-educated and knowledgeable extension service (if available), NGOs, and/or on the continuing advice of other players in the supply chain (e.g. established cooperatives, processors, marketers). The following internal requirements are considered to be crucial for the success and sustainability of agricultural cooperatives in developing areas:

- A shared recognition by members of the advantages to be gained by cooperation, such as scale economies and/or increased bargaining power. Cooperation requires effort and investment. It is difficult to keep members engaged if they do not perceive immediate benefits from working together.
- Strong leadership among cooperative members. Community leaders should fully understand cooperative principles and respect the views of potential members, who would have the power to make or influence decisions in a cooperative.
- Basic business skills for all members so that they can be informed participants in strategic decisions and management oversight. (A general lack of education among potential members in rural areas could be a major constraint at present.)
- Access to a labour market for capable managers. As cooperatives grow, it is often necessary to hire managers with experience and expertise beyond that which can be provided by cooperative members. A rich,

competitive managerial labour market offers ready access to managerial skills, and the threat of being replaced can motivate and discipline managers who have been hired by cooperatives. The lack of markets for skilled managers may also constrain cooperative development.

Other (general) business-success factors that could promote successful cooperation include, amongst others: promotion of members' interests by managers and boards of directors; participation of members in formulating policy; educating members; and ensuring quality and safety of products for sale (see also Machethe, 1990; Fulton *et al.*, 1996; Reardon & Barrett, 2000; Trechter *et al.*, 2002).

5. Should cooperatives be established in the study areas?

Based on the analyses in the previous sections, it seems reasonable to assume that cooperatives could be established in the two study areas of the KwaZulu-Natal midlands (Impendle and Swayimana), albeit with considerable challenges. The main constraints include low levels of education and literacy of smallholders, poor road and telecommunication infrastructure, and insecure property rights. Alternatively, IOFs may provide a better service to small-scale farmers in terms of marketing their products and providing inputs, credit, and information on input use and markets. However, a critical question relates to the efficient (optimum) boundaries of the cooperative in relation to those of the IOF. Which activities in a vegetable supply chain, for example, should be performed by a cooperative and which activities by an IOF, if any? What economic factors define these boundaries? Before these are considered, the characteristics of each study region in terms of their effects on transaction costs will be briefly summarized.

In the two regions the vegetable supply chain from production to market could involve the following basic stages: Production → Assembly → Transport → Wholesale/Retail Sales. Assuming a cooperative is considered, where would its most efficient boundary be? Should it encompass all four main activities? If not, then how many? Alternatively, where would the most efficient boundary of an IOF be? The answer depends on the operational (production) and transaction costs involved for each type of organization in the supply chain (Williamson, 1981). The efficient boundary for each organization would depend on minimizing the sum of operational and transaction costs. For example, assuming a cooperative at a central location is involved in the assembly, sorting, and packaging of vegetables for members, then it could reduce these (fixed) costs per unit by expanding its operation (e.g. members supplying more vegetables). Fixed costs may include the rent of

a building, employee costs, and communicating (transacting) with members who produce vegetables. If the cooperative considered transporting the value-added product to market as well, using a hired vehicle, then transport costs per unit of vegetables would increase with distance, albeit not linearly. Finding markets and negotiating with potential buyers could also involve considerable transaction costs. With decreasing assembly, sorting, and packaging costs per unit and increasing transport cost per unit, an optimum size of operation would be determined where the sum of the two costs is minimized. However, the transport and marketing (transaction) costs could be so prohibitive for the cooperative that its boundary may only encompass the production and assembly/sorting/packaging activities (i.e. the first two stages) in the vegetable supply chain.

From an IOF's perspective, where would its most efficient boundary be? As an example, an entrepreneur in a Pietermaritzburg or Durban township considers starting a vegetable marketing business, which could provide a much-needed service for township residents who are unable to easily access other vegetable markets (e.g. municipal markets in the major cities). He owns a truck, which he could use to collect vegetables from both small-scale and commercial farmers in the region, and considers renting a building where he could assemble, wash and package the vegetables. He considers selling the value-added vegetables to township residents every Tuesday and Saturday. His operational costs include the rent of the building, costs of employees that help wash and package the vegetables, and transport cost in collecting vegetables from farmers. Transaction costs in dealing with farmers could be substantial; e.g. negotiating with many smallholders is time consuming and collecting their product is usually difficult and costly because of poor road and communication infrastructure in rural areas. Trading with only a few large commercial farmers is more economical due to much lower transaction costs. However, he sees an opportunity to market the product of smallholders under a different label, which may appeal to some township residents. The efficient boundary of the IOF would again depend on minimizing the sum of operational and transaction costs. The entrepreneur may find that the transaction costs in dealing with many farmers, and the costs of collecting (transporting) vegetables from these farmers, would be prohibitive. Also, the washing, sorting, and packaging activities require larger premises and more employees (and with it principal-agent problems), which involve higher costs. However, if he could purchase fresh, graded and packaged vegetables from a central location, his transaction and transport costs would be considerably reduced, and he could also rent smaller premises for storage and employ fewer workers. His operational and transaction costs may thus be considerably reduced. So the boundary of his firm may only involve a transport operation

and storage and wholesale or retail sales of vegetables in the township (i.e. the last two stages of the supply chain).

Considering the whole vegetable supply chain in the study areas and the "boundary" analysis for a cooperative and IOF, the optimum arrangement for the supply chain (i.e. one that minimizes the sum of operational and transaction costs across the whole supply chain) may comprise a "hybrid" model; i.e. one in which a cooperative and an IOF play a role. For example, a cooperative's optimum boundary may encompass production, assembly, sorting, grading and packaging of vegetables, while the IOF's optimum arrangement may involve transporting the value-added products from a central (cooperative) location and selling these products in township markets. Because of a more efficient operation, the IOF entrepreneur may also be willing to advise smallholders on collective action and provide useful information, such as the correct use of inputs, and the type of vegetables and product quality that the market demands. Cooperative members could benefit from this information and reduced transaction costs in dealing with a dependable agent, and by having a ready market for their products.

Smallholder farmers, who consider collective action in an attempt to gain better access to input and product markets and to reduce transaction costs for individual producers, would face the initial challenge on how to establish a cooperative, given the constraints they face. Since the government supports the formation of cooperatives, the smallholders could approach the extension service of the provincial department of agriculture (who may also want to involve the DTI) for information and guidance on the formation of a cooperative and on the likely benefits and costs of collective action. Strong leadership and enthusiasm for collective action would also help to promote the formation of a cooperative. It may be advisable for a small group of enthusiastic vegetable growers to initially start such a venture to ensure a reasonable chance of success. Initially, members of the group may share the responsibility for managing the collective business, but if it has grown sufficiently they may consider hiring someone (perhaps on a part-time basis) to keep records (e.g. of the type and quality of vegetables supplied by each member, prices obtained and costs incurred) and to manage the daily affairs of the business. However, agency problems may arise when the objectives of the manager/secretary do not coincide with those of the members. Finding the right incentives to align the objectives may be difficult (e.g. paying a managers' bonus based on business volume may reduce agency problems). Any profits generated by the collective business could be distributed among members according to patronage. However, trust among members would be a vital element in the success of such a group.

Assuming the group establishes itself, membership grows with additional smallholders, knowledge of markets expands, and the benefits of cooperation are realized, the group may decide, at some stage, to officially apply for the registration of an agricultural cooperative with the DTI. The formal establishment of a cooperative may proceed with official approval of the DTI and assistance from extension officers, NGOs, IOFs, and established, successful cooperatives. Roets (2004:215) also provides useful guidelines for the formation of cooperatives. The constitution of the cooperative, membership fees, members' rights and responsibilities, election of a board of directors, and appointment of a manager/secretary would be important elements in the formation of the organization, as would awareness among members, directors and manager(s) of the conditions for successful cooperation that were discussed in the previous section. The government also needs to allocate its limited resources on creating the right economic and legal environment so that cooperatives and other business entities can thrive; i.e. physical infrastructure (roads, telecommunications) and legal infrastructure (courts that uphold contracts and private property rights) need to be improved, while land rental markets in communal areas need to be promoted as well. A new cooperative could lobby the government to incur the necessary improvements in the area.

6. Conclusions and recommendations

This research focuses on whether a conventional cooperative is the appropriate organizational form for small-scale (communal) farmers in South Africa to use to facilitate access to input and product markets. These farmers have limited access to farming inputs, credit and information, and markets are often constrained by inadequate property rights and high transaction costs. Furthermore, household heads are often poorly educated, have no own transport, are geographically dispersed, and are faced with poor road and communication infrastructure. But conventional cooperatives also have inherent weaknesses, such as free-rider, horizon, portfolio, control and influence cost problems, which are attributable to their property rights constraints. Is a cooperative thus the right organizational form for these farmers?

In a case study of smallholder farmers in two communal areas of KwaZulu-Natal (Impendle and Swayimana), most of the reasons for establishing cooperatives in various parts of the world are also appropriate to these farmers (i.e. reasons such as poverty; market failure; drive for self-help; providing missing services; operating at cost; improving members' incomes; enhancing bargaining power; coordinating flow of inputs and products; and

community development). The seven international principles of cooperation (democratic member control; member economic participation; autonomy and independence; provision of education, training, and information; cooperation among cooperatives; and concern for the community) are also considered to be applicable to, and would likely be accepted by, the two communities. However, an analysis of the inherent weaknesses of conventional cooperatives and their applicability to the case study farmers suggests that the free-rider, horizon and portfolio problems would also be applicable to smallholder members in an emerging cooperative. These potential constraints may initially (i.e. when the cooperative is established and members of similar wealth try to make it work) not cause insurmountable problems, but they could constrain investments in, and growth of, the cooperative in the future as members' businesses grow, and wealth and patronage levels among members change. Control (principal-agent) and influence cost problems could also emerge as the cooperative develops and expands its membership and activities. Proponents of cooperatives and potential cooperative leaders in less-developed areas should be aware of these likely problems facing cooperatives before they are established. Furthermore, appointed managers and elected directors should keep an open mind about the growth cycle of cooperatives; i.e. as the cooperative matures members may find it appropriate to convert their cooperative into another (more efficient) ownership structure, such as a new generation cooperative or an IOF.

Studies of poor-performing and failed cooperatives in the former homelands of South Africa suggest that members have not clearly understood the purpose of a cooperative, how it functions, and what members' rights are. This may have stemmed from members' lack of education, training and information. Weak and authoritative management also has played a major role in cooperative failures. However, external factors, such as uncertain property rights, inadequate road and communication infrastructure, and poor access to input and product markets (due to costly information and high transaction costs), have also contributed to cooperative failures and need to be addressed by policy makers. Government needs to play a proactive role in creating a legal, economic, administrative and institutional environment that will promote private initiatives aimed at, for instance, establishing land rental markets, marketing associations or cooperatives, and IOFs in regions that have a good potential for producing and selling high-value crops. Government, through the national and provincial departments of agriculture, should also consider developing simple, standard record-keeping and other decision-support systems for cooperatives and their members that would facilitate proper bookkeeping and improved decisions by managers. These systems may also promote use of study groups among cooperatives and members for

comparative analyses. The government may also consider implementing simple grading systems that could be included in easily-understood cooperative contracts with producer members and wholesalers (traders). These institutional innovations may greatly facilitate participation by smallholders in collective action (cooperatives) and enhance their potential success.

A critical, but not sufficient, requirement in rural development is the education and training of rural communities. An appropriately educated and motivated extension service could play an important role in this regard. Anecdotal evidence suggests that the present provincial (government) extension service is not well motivated and lacks resources to provide effective extension services to smallholder farmers. They may also be unable to advise smallholders on the benefits and costs of establishing organizations such as cooperatives or on how to bring about institutional change that would promote land rental markets and reduce transaction costs. Re-training extension agents - which will take time - may be an important requirement for a more effective extension service. Non-governmental organizations (NGOs) and advisors employed by successful cooperatives and IOFs (such as marketing agents, supermarkets, and processors of agricultural commodities) could also complement the efforts of extension agents on advising smallholders on group action. If cooperatives are formed, ongoing mentoring and training of cooperative managers, directors, and members - by the DTI, extension agents, successful cooperatives, NGOs, and other advisors - will most likely be crucial, at least until the cooperatives can operate independently. Cooperative members and managers should benefit from advice and training through improved information flows, technical advice on applying new technology, and how to improve the quality and safety of products.

There are also internal factors that are crucial for cooperatives to succeed in less-developed areas. These include: clear, shared understanding of the benefits of cooperation; strong and enthusiastic leadership in the community for group action; basic business skills for all members; and access to a rich, competitive market for competent managers. The effectiveness of these factors depends largely on educating and training cooperative members, managers and directors. As indicated earlier, this function could be performed by the DTI, an appropriately educated extension service, successful cooperatives, NGOs, and advisors employed by IOFs. The SA Primary Agriculture Education and Training Authority (PAETA) could provide funding for some education and training sessions delivered by NGOs and IOFs (Roets, 2004).

In the case study areas, both Impendle and Swayimana have the potential to grow high-value crops such as vegetables, fruit, and cut flowers. Swayimana farmers have a transport advantage by being closer to larger urban markets and to the proposed development of a trade port and international airport north of Durban. The optimum boundary for each organization involved in the product supply chain depends on minimizing the total operational and transaction costs for each business. For example, the optimal arrangement for a cooperative in a rural area may encompass the production and assembly (including washing, sorting and packaging) of vegetables. The efficient boundary of an IOF operating from a central market (urban or township) may include transporting the value-added products from the cooperative and selling these to township consumers. Such an optimal "hybrid" arrangement across the supply chain could benefit both cooperative members and IOFs.

Further research on the appropriate organizations that could help promote access of smallholders to input and product markets in the two study areas - and in South Africa in general - could include a detailed case study analysis of operational and transaction costs for various role players in a particular (e.g. vegetable) supply chain and determining the efficient boundaries for each organization. The outcomes could provide useful guidelines for smallholder farmers (who are eager to gain access to markets), IOFs (who may see profit opportunities in participating in the supply chain), and advisers (e.g. extension agents, NGOs, and other development consultants) who could assist in developing an efficient product supply chain. Should cooperatives feature in such a supply chain, other research could ascertain the degree of knowledge among government departments (e.g. extension service, DTI), smallholder farmers, NGOs and other advisors on agricultural development, of cooperative principles, potential benefits and inherent problems of cooperatives, and potential support from government for smallholders who wish to establish cooperatives. The outcome of this survey may point to the likely education and training needs among various parties interested in forming cooperatives. Policymakers may also then wish to reconsider their strategies regarding support for cooperatives serving small-scale farmers.

Acknowledgements

The senior author gratefully acknowledges funding from the National Research Foundation (NRF) in South Africa and the Centre for International Food and Agricultural Policy (CIFAP) in the Department of Applied Economics at the University of Minnesota. Opinions expressed and conclusions arrived at in this document are those of the authors and do not necessarily reflect those of the NRF or CIFAP.

References

Barton DG (1989). *What is a cooperative?* In: Cobia D (ed), *Cooperatives in agriculture*, 1-20. New Jersey, USA: Prentice-Hall, Inc.

Barton D (2000). *What is a cooperative?* Unpublished paper, Arthur Capper Cooperative Center, Kansas State University, USA.

Cook ML (1995). The future of U.S. agricultural cooperatives: A neo-institutional approach. *American Journal of Agricultural Economics* 77(5):1153-1159.

Delgado C (1999). Sources of growth in smallholder agriculture in sub-Saharan Africa: The role of vertical integration of smallholders with processors and marketers of high value-added items. *Agrekon* 38(Special Issue):165-189.

DTI (Department of Trade and Industry) (2003). *A co-operative development strategy for South Africa.* Annexure 2003/4/10 - Attachment 1 Draft. Department of Trade and Industry, Pretoria, South Africa.

DTI (Department of Trade and Industry) (2004). *A co-operative development policy for South Africa.* Department of Trade and Industry, Pretoria, South Africa.

Fulton JR, Popp MP & Gray C (1996). Strategic alliance and joint venture agreements in grain marketing cooperatives. *Journal of Cooperatives* 11:1-14.

Fulton M & Ketilson LH (1992). The role of cooperatives in communities: Examples from Saskatchewan. *Journal of Agricultural Cooperation* 7:15-42.

Holloway G, Nicholson C, Delgado C, Staal S & Ehui S (2000). Agroindustrialization through institutional innovation: Transaction costs, cooperatives and milk-market development in the east-African highlands. *Agricultural Economics* 23(3):279-288.

ICA (International Co-operative Alliance) (2005). <http://www.ica.coop/> (accessed September 1, 2005).

Iliopoulos C & Cook ML (1999). The internal organization of the cooperative firm: An extension of a new institutional digest. *Journal of Cooperatives* 14:77-85.

Kirsten J & Sartorius K (2002). Linking agribusiness and small-scale farmers in developing countries: Is there a new role for contract farming? *Development Southern Africa* 19(4):503-529.

Kuhn ME (2003). *Improving access of low-income people to formal financial services: Evidence from four microfinance organisations in KwaZulu-Natal.* Unpublished PhD Thesis, Department of Agricultural Economics, University of Natal, Pietermaritzburg, South Africa.

Lyne MC (1996). Transforming developing agriculture: Establishing a basis for growth. *Agrekon* 35(4):188-192.

Lyne MC (2005). *Personal communication.* Professor of Agricultural Economics, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

Machethe CL (1990). Factors contributing to poor performance of agricultural co-operatives in less developed areas. *Agrekon*, 29(4):305-309.

Matungul PM, Lyne MC & Ortmann GF (2001). Transaction costs and crop marketing in the communal areas of Impendle and Swayimana, KwaZulu-Natal. *Development Southern Africa* 18(3):347-363.

Mthembu J (2005). *Personal communication.* KwaZulu-Natal Department of Agriculture and Environmental Affairs, Cedara, KwaZulu-Natal, South Africa.

NCBA (National Cooperative Business Association) (2005). <http://www.ncba.org/> (accessed on August 29, 2005).

NCFC (National Council of Farmer Cooperatives) (2005). <http://www.ncfc.org/> (accessed on August 5, 2005).

NDA (National Department of Agriculture) (2005). *Abstract of Agricultural Statistics.* Directorate: Agricultural Statistics, National Department of Agriculture. Pretoria, South Africa.

Ortmann GF & King RP (2007). Agricultural cooperatives I: History, theory and problems. *Agrekon* 46(1):40-68.

Piesse J, Doyer T, Thirtle C & Vink N (2003). *The changing role of grain co-operatives in the transition to competitive markets in South Africa.* Research Paper 020, The Management Centre, King's College, University of London, London, UK.

Reardon T & Barrett CB (2000). Agroindustrialization, globalization, and international development: An overview of issues, patterns, and determinants. *Agricultural Economics* 23(3):195-205.

Roets M (2004). *From folklore to feasibility: Commercialisation of South Africa's indigenous goats.* Unpublished PhD Thesis, Department of Agricultural Economics, Extension and Rural Development, University of Pretoria, Pretoria, South Africa.

Royer JS (1999). Cooperative organizational strategies: A neo-institutional digest. *Journal of Cooperatives* 14:44-67.

RSA (Republic of South Africa) (2005). *Co-operatives Act, 2005.* Government Gazette, 18 August 2005, Cape Town, South Africa.

Schrader LF (1989). *Economic justification.* In: Cobia D (ed), Cooperatives in agriculture, 121-136. New Jersey: Prentice-Hall, Inc.

Trechter DD, King RP & Walsh L (2002). Using communications to influence member commitment in cooperatives. *Journal of Cooperatives* 17:14-32.

Van der Walt L (2005). *The resuscitation of the cooperative sector in South Africa.* Paper presented at the International Co-operative Alliance XXI International Cooperative Research Conference, Cork, Ireland, August 11-14, 2005.

Van Dijk G & Werts J (1996). *The cooperative's most precious asset: Member involvement.* In: Egerstrom L, Bos P & Van Dijk G (eds), *Seizing control: The international market power of cooperatives*, 102-122. Rochester, Minnesota, USA: Loan Oak Press, Ltd.

Williamson OE (1981). The economics of organization: The transaction cost approach. *The American Journal of Sociology* 87(3):548-577.

Williamson OE (1985). *The economic institutions of capitalism: Firms, markets, relational contracting.* New York, USA: The Free Press.

Appendix 1

Table A1: Sample household characteristics in two communal areas of KwaZulu-Natal, 1999

Particulars	Impendle (n=120)	Swayimana (n=120)	Average (n=240)
Mean household size (people)	6.2	7.1	6.7
Mean age of household head (years)	57.9	59.0	58.5
Years of formal education	4.8	5.6	5.2
Mean distance to district road (km)	7.0	5.7	6.3
Mean distance to public phone (km)	2.8	4.6	3.7
Years of residence in the district	25.4	37.5	31.3
Mean land size (hectare)	1.1	1.8	1.5
Visits by extension officers /year	1.2	1.0	1.1
Dependents per worker	2.3	2.0	2.2
Household with own transport (%)	27.5	37.5	32.5
Household with TV/radio (%)	55.8	55.0	55.4
Household headed by a female (%)	32.5	39.1	35.5
Household head speaks English (%)	32.5	40.0	36.2
Mean crop sales (Rand)	1,183	1,416	1,299
Distance to Pietermaritzburg (Km)	85	65	75

Source: Matungul *et al.* (2001:350).