New Institutional Arrangements for Rural Development: The Case of Local Woolgrowers' Associations in the Transkei Area, South Africa

MARIJKE D'HAESE, WIM VERBEKE, GUIDO VAN HUYLENBROECK, JOHANN KIRSTEN and LUC D'HAESE

I. INTRODUCTION

It is widely recognised that globalisation and more open trade arrangements could provide new opportunities for livelihoods in poor rural areas. Smallholder farmers in developing countries are often confronted with many constraints which restrict their access to markets (both input and product markets), and hence, limit opportunities for commercial farming. Yet more theories have been proposed than solutions on how to include increasingly marginalised small-scale farmers into growing markets for high value commodities. A growing body of literature reports on the merits of institutional innovation, although the number of empirical analyses is growing steadily.

The World Development Reports of 2002 and 2003 focus on respectively building and transforming institutions for economic growth. Both reports add to a new (post-) Washington consensus that trade liberalisation and institutional change are two sides of the same coin. In particular the World Development Report 2002 focuses on new institutional arrangements supporting farmers to connect to the commercial supply chains. Yet, the role of the government in this area, and in creating an enabling production and market environment, is still widely debated. A government could, for instance, intervene actively in the product market with commodity price stabilisation schemes; or provide direct income support to farmers by eliminating tax policies or by subsidising; or again, encourage farmers to initiate contract farming and to form export-marketing cooperatives.

The latter is also supported recently by Kydd [2002a; 2002b],

arguing that smallholders would benefit significantly from 'deliberative institutions, working horizontally inside the sector and vertically along the supply chain, based on a consensus of what may constitute a just outcome'. For smallholder farmers who are faced with missing or imperfect markets, institutional innovation should foster the negotiation of new contracts and better institutional arrangements, which reduce transaction cost and overcome certain market failures [Cook and Chaddad, 2000; Hoff and Stiglitz, 2001]. The new institutions should then be superior institutions which are 'judged in terms of a reduction of transaction costs, improving co-ordination, stronger strategic commitment to investing in needed specific assets and allocative efficiency' [Kydd, 2002a; 2002b]. However, as Kydd [2002a; 2002b] mentions, evidence on alternative policy proposals to trade liberalisation and policy experiments are scarce.

This paper aims to make a contribution with empirical evidence from a case study on associations of small-scale wool producers in the Transkei area, one of the former homelands of South Africa. In collaboration with the government, the South African wool industry provided new infrastructure to properly shear the sheep and grade and package the wool in some selected villages. The local woolgrowers' association coordinates the information flow, the shearing and the marketing. Yet, the association does not function as well as expected in all villages, and within the village, not all farmers are equally interested in joining the association.

This paper grapples with two questions: first, what influences the success of the association; and second, what are the benefits for the farmers who are member of the association.

The empirical results presented in this paper exemplify how collective action within an association contributes to a conducive market environment by providing a selling platform to bulk the wool and thereby decreasing post-harvest handling and transaction costs as a result of a more direct access to the wool auction. It also discusses the importance of social capital of the community, in particular the level of trust among the farmers, on the success of the association.

The plan of the paper is as follows. The next section starts with an overview of the case at hand. It further discusses the importance of the community's social capital for the emergence and success of a local woolgrowers' association. Next, a transaction cost economics frame is presented. The empirical work consists of specifying and estimating a three-step treatment effects model. Finally, findings are discussed and conclusions are set out.

II. SMALLHOLDER WOOL PRODUCTION IN TRANSKEI

Background

Most rural people of the Transkei area face a daily struggle with poverty and underdevelopment. Poverty is endemic and, due in particular to the high average age of the population, future opportunities and alternatives for income are lacking. Because of poor infrastructure (roads, electricity, telephone lines, running water), low human capacity and deterioration of natural resources, the area is considered backward. A high proportion of the active population leaves the area for the cities, in search of a better livelihood. Once there, however, people confront an economy blighted by an unemployment rate of over 30 per cent. Still, poverty rates are higher in the rural areas, and migration is a fact of life. As a result, agriculture remains important to many households' food security.

Households in the 'black' rural areas in Southern Africa typically keep livestock for a combination of economic and non-economic reasons [Chilonda et al., 1999]. In economic terms, livestock are kept as an asset as well as a production resource (for milk, wool or meat). Households will invest in cattle, sheep and goats as a means of saving or store of wealth. Cattle and sheep can also be slaughtered at ceremonies or important family meetings. A majority of households (or extended families) own some cattle or sheep, but hardly any can be regarded as commercial livestock or wool farmers.

Sheep farming is especially important in the rural areas of the Eastern Cape, Transkei and Ciskei area in particular. Yet wool production is mainly characterised by low production efficiency, and wool fetches low prices. The latter is due to primitive shearing methods, the absence of grading and sorting and a lack of access to alternative markets. Also packaging is not up to standard. The Transkei and Ciskei area account for some 3 per cent of wool production (33,670 kg greasy wool mass) in the Eastern Cape, but only 1.4 per cent of the auction realisation value. The relatively lower realisation value can partly be explained by the very low percentage of higher quality Merino wool supplied by the Transkei and Ciskei area. The wool is mostly of a coarse and coloured type and is described as wool of 'largely a Basuto and/ or Ciskei/Transkei character' [Cape Wools SA, 2001].[1]

Although wool is a high value tradable, it has been a less important product for farmers for a long time. The production of quality wool and access to its markets demand specific on-farm investments in order to intensify the production, and allow for proper harvest and post-harvest handling. Also transport and marketing are

costly. The intervention proposed by the government and the National Woolgrowers' Association (NWGA) is to form local woolgrowers' associations throughout the Transkei area. In some selected villages, these associations are actively supported by the NWGA. This includes building and equipping a shearing shed, forming a shearing and a classing team and providing training in production practices to the farmers. The objective of the project is that the association and the shearing shed provide for a more profitable marketing of wool. The shearing sheds in the case study villages had recently been renovated at the time of the survey.

Social Capital and Collective Action

The project of the National Woolgrowers' Association contributes to both physical infrastructure and human capital. Moreover, the local association embodies new institutional arrangements that are the basis of horizontal cooperation among the local farmers and new contracts vertically within the supply chain with the brokers who trade the wool on the auctions. The collective action builds on the social capital of the community. Rainey et al. [2003] stress the importance of social capital as a third component for rural development next to physical infrastructure and human capital aforementioned. Since Coleman introduced the term 'social capital' in his publication of 1988, it has been extensively discussed in literature (literature reviews are given in, for example, Grootaert [1998], Popay et al. [1998], Lyon [2000], Harris [2001], Osgood and Ong [2001], Grootaert and Van Bastelar [2002], Rainey et al. [2003], World Bank [2003].

Coleman [1988] saw social capital as the 'structure of relations between actors that encourages productive activities', and as 'a variety of different entities, with two elements in common: they all consist of some aspect of social structure and they facilitate certain actions of actors – whether personal or corporate actors- within the structure'. Putnam [1993] on the other hand refers to social capital as the set of 'horizontal associations' between people, forming social networks and he lays stress on the important economic consequences of norms and networks.

The importance of social capital for development is clear because social capital (for example, trust and personal networks) governs behaviour. The social capital of a community forms a basis for new initiatives, that is, associations for procuring and sharing information, coordinating collective activities and decision making [Grootaert, 1998]. In communities with a high level of social capital,

also described as civic communities, networks, norms and trust forster coordination and cooperation [Putnam, 1993] and deliberative associations will be more easily formed [Portes and Landolt, 1996].

This brings us to the first hypothesis of this study, namely that the success or failure of the association depends to a large extent on the community in which it is established. It is argued that the probability of the farmer becoming a member of the association depends on the community to which he or she belongs, besides a set of personal and farm characteristics.

The informal networks, based on informal rules and embedded in norms, customs, mores, traditions and codes of conduct are regarded by Williamson [2000] as the first level of institutions. They form a platform on which the institutional environment is formed. Williamson considers the latter the second level of institutions which are the 'formal rules of the game'. On a third level there are institutional arrangements. The next section discusses how the New Institutional Economics literature can help us to explain why new institutional arrangements are fundamental for the access of farmers to more profitable markets.

Joining a New Supply Chain

Farmers in many developing countries lack access to markets. This is due to a self-reinforcing cycle of problems comprising low population densities and poor communication infrastructure which characterises these rural areas. These in turn bring about important market failures, resulting in low economic development and ultimately insufficient prospects for improving the infrastructure [Dorward et al., 2002]. Many development initiatives are concerned with including the increasingly marginalised small-scale farmers in emerging markets for high value commodities. Production and sales cooperatives and associations are set up with the aim of decreasing either physical costs related to production, harvest, post-harvest and transport costs and/or transaction costs.[2]

Some recent empirical studies illustrate the beneficial impact of institutional change on market access. Escobal, Agreda and Reardon [2000] report on a management company whose aim is to promote cotton in Peru. The management company contributes towards the decrease in transaction costs and creates economies of scale in input purchase and product marketing. In the same paper Escobal et al. [2000] also analysed the success of contracts between the agroindustry and asparagus farms in Peru for increasing the quality of grading and standardisation. Holloway et al. [2000] show how the

organisation of farmers in milk groups contributes to the market participation in the East-African highlands (evidence was given for farmers in Ethiopia) because it decreases transaction costs (also analysed in Staal, Delgado and Nicholson [1997]).

Other case studies can be found in Jaffee and Morton [1995] and Dorward etal. [1998], indicating that effective institutions which decrease marketing and transaction costs depend upon the characteristics of the product, the market, the producers, the traders and other constraints that influence the product and market environment. Wool has the same characteristics as cotton as it too is a bulky and non-perishable product, in contrast with asparagus and milk. Hence, the case at hand may show some analogies with Escobal et al. [2000].

Marketing of wool through the shearing shed provides a new supply chain for small-scale farmers in the Transkei area (Figure 1). The farmers can organise their own shearing and sell directly to brokers (Figure 1.a). However, in practice two alternative distribution channels exist. The wool can be shorn on the farm and sold to local traders who buy the unsorted wools at the farm-gate (Figure 1.b), or the wool can be produced by the members of an association, who shear their wool in a shearing shed and pack the wool collectively (Figure 1.c).

In the traditional channel (Figure 1.b) farmers shear the sheep themselves at their houses. However, this activity is also often organised communally. Owners of sheep in the village hire a shearing team and women for sorting the wool, then trade the wool with the brokers. They also deal with local traders, who operate in the informal market. They are businessmen or traders who pay low prices to the farmers. These local traders are perceived as an easy market outlet as they pass by the houses, paying straightaway. As transport is often a problem for farmers in these remote regions, small-scale farmers are at the mercy of the traders. This results in low prices.

The impact of new institutional arrangements horizontally (among farmers), and vertically in the supply chain is threefold. First, to overcome problems of post-harvest handling and transport of the wool. The shearing shed provides an option for the farmers to market the wool directly on the auction. Because their wool production is too small, they are not able to reach the auction on an individual basis. The majority of the farmers in the survey do not produce enough to fulfil the standard requirements of trade, namely all wool should be packed in bags according to the quality class.

Second, the common shearing can reduce the transaction costs

and allow the farmers to access a more profitable market. On an individual basis, farmers have few opportunities or means to come into contact with brokers who can trade the wool on the auction. The transaction costs are just too high; communication between farmers and brokers is difficult or non-existent because the search costs are too high for both partners compared to the benefits they would reap from trading. The negotiations are time-consuming and expensive because they are at a long distance from one another and transport and communication are problematic in the rural areas of the Transkei area. Furthermore, bargaining and information asymmetry between the individual farmer and broker is huge. The poor, isolated farmer does not know what is going on at the auction. He is therefore very reluctant to trade his wool with the broker. Moreover, the broker will only pay when the wool has been sold. The farmer has to wait for his money, while the sale of his product is totally in the hands of the broker. Furthermore, farmers and brokers speak a different language (real and figuratively). Farmers therefore 'feel' at risk of malfeasance of the brokers, which is still influenced by the legacy of Apartheid.

Third, in the long term, the increased sales of wool, could result in specialisation which might induce a much stronger commitment on the part of the farmers to invest in specific and co-specific assets[3] [Kydd, 2002b].

We propose that the farmers can gain from selling the wool through the shearing shed, because it would provide them with a higher selling price. It is argued that this is merely due to the new institutional organisation which enables a reduction of the high transaction costs that limit farmers to market their wool individually. In both marketing channels available (selling wool to the traders or through the brokers), farmers have to pay for post-harvest handling, marketing and transport. It is argued that these costs are more or less the same in both marketing channels, because in the end, the wool is sold on the same auction. The local traders will take these costs into account when negotiating the price paid to the farmer, while in the case of the shearing shed, all costs are deducted from the amount paid to the farmer. It is therefore argued that the price differential, resulting in different revenues is the result of differences in transaction costs.

FIGURE 1
ALTERNATIVE MARKETING CHANNELS OF SMALLHOLDER WOOL FARMERS, (a) FARMERS ORGANISE MARKETING INDIVIDUALLY, (b) FARMERS SELL TO A LOCAL TRADER, (c) FARMERS SELL TO A SHEARING SHED.

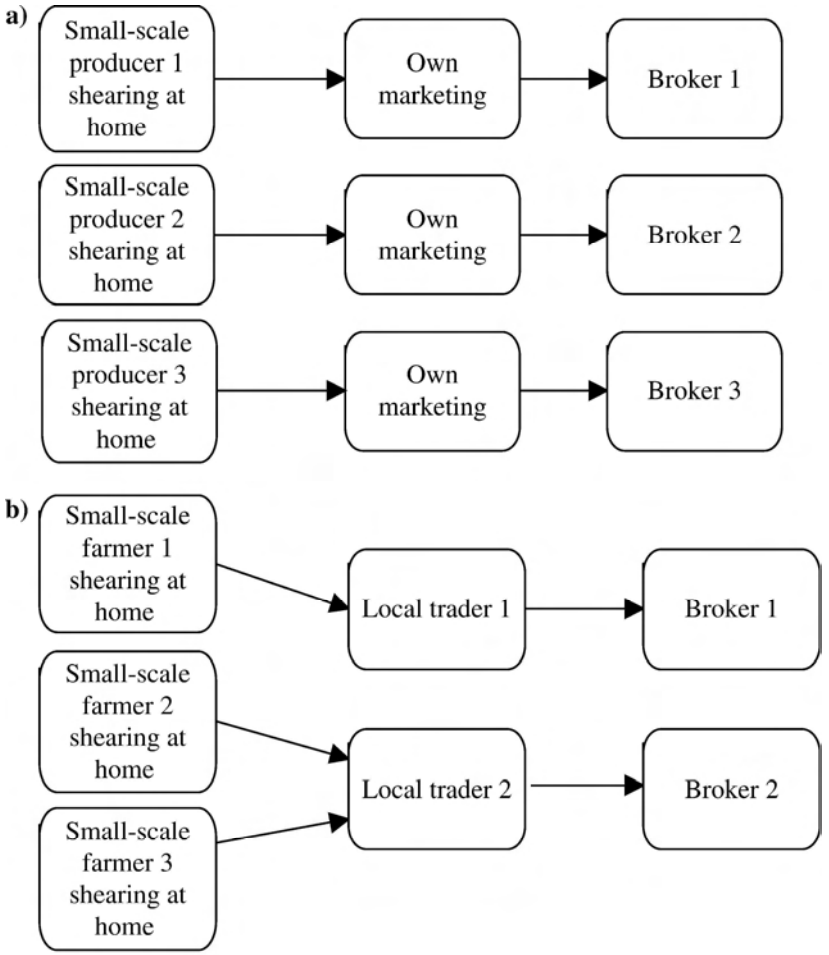
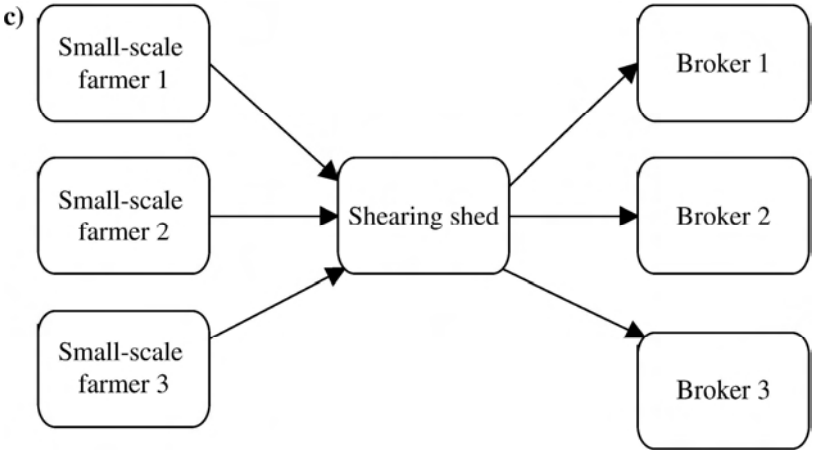


FIGURE 1 (Continued)



Yet, transaction costs are difficult to calculate for two reasons. First, they are not easily observed. It is not possible to calculate hypothetical transaction costs for organisational forms that are not chosen. Thus, transaction costs that a single firm can face in alternative organisational arrangements cannot be quantified ex ante. Second, the data needed to compare organisational forms are not easily quantifiable. An analysis of transactions would be more significant if the attributes of the transaction could be related to data on the organisational form or contract arrangements [Masten, 1996].

Because of the difficulty of assigning a price to transaction attributes and assuming that the organisational arrangements are chosen to economise the transaction costs, empirical research that aims to apply a direct cost measure is scarce [Williamson, 1995]. The application of a comparative institutional approach is more general. According to Williamson [1995], discrete institutional alternatives should be compared, allowing attributes of the transactions to be defined, and the incentive and adaptive attributes of the alternative governance structure to be described [Williamson, 1995]. According to Masten [1996], comparative institutional analysis should make the comparison between the performance of a firm that adopted a particular arrangement and the performance of the same firm had it adopted an alternative. Therefore, to analyse the impact of a shearing shed and its

association on the smallholder farmer's revenue, the revenue from wool of farmers who opted for the shearing shed (Figure 1.c) is compared with that of farmers who didn't (Figure 1.b). The next section presents the method of analysis.

III. METHOD OF ANALYSIS

Data Collection

This article reports on a survey conducted in three villages in the Transkei area: Luzie, Xume and Mhlahlane during August and September 2000. In Xume and Luzie a shearing shed was established and equipped by the NWGA. The shearing committee in Luzie was active and well organised at the time of the survey. The shearing committee in Xume was still in existence, but dormant, due mainly to the non-activity of the shearing shed as the renovation works were just finished. Finally, Mhahlane is a village neighbouring Xume, which does not have its own shearing shed.

A list of sheep farmers was not available, so that the respondents were selected through a non-probability sampling. Sample units were selected through convenience and judgement of the interviewers. Households were visited house to house, farm to farm, and farmer gatherings were organised. All interviews were executed personally and translation was done by local extension officers. A total of 105 farmers were interviewed (18 in Mhahlane, 47 in Xume and 40 in Luzie), of whom 38 were member of a shearing shed. Gender distribution within the sample was 69.5/30.5 female/male.

The average number of animals on the farm for 105 cases equalled 80.46 (s.d. 159.91). We believed that the high standard deviation was too high and therefore rejected 12 outliers from the analysis. The rejected cases were holdings with more than 380 or fewer than five sheep. The average number of animals on the 93 remaining farms was equal to 51.48 animals with a standard deviation equal to 57.78. For the regression analysis, three more cases were excluded due to missing data.

The questionnaire investigated on the farm business and an elaborated list of questions on the structure, inputs and revenues from sheep farming were included.

Model Specification

A three-step treatment model is defined to measure the impact of the local woolgrowers' association on the farmers' revenue from wool.[4] First, based on the Heckman procedure for selection bias, a probit model for participation in the association is estimated, whereby the Inverse Mills Ratio and expected probability are saved as new variables for each case.[5] Second, the revenue from wool per sheep is regressed on farm and wool characteristics. In a third step, the residual from this regression is regressed

over the dummy indicating the membership of the association and the Inverse Mills Ratio. Eventual significance of the Inverse Mills Ratio gives an indication of the importance of unobservable factors (for example, managerial skills or previous experience) that will increase both the probability of local association participation and subsequent revenue. Furthermore, farmers who choose to participate in the local association can be considered as more seriously concerned with the wool business. Therefore, it could be that the choice of participating in the local association goes hand in hand with increased investment and/or increased production. This would result in an over-estimation of the estimator of the dummy of participation in a linear dummy-variable regression [Greene, 2000]. Therefore, it is necessary to check for self-selectivity bias in the estimation of the effect of membership of the local association on the revenue. This check is performed through the three-step estimation procedure applied. The probit analysis was performed in LIMDEP, while SPSS was used for the regression analysis.

Step 1. The Probit Model

The estimated probit model should give an indication of the set of variables contributing to the choice of participating in the local association. Therefore, the most obvious variable to include in the model was the presence, or lack of, an active shearing shed. A dummy was constructed to indicate that the shearing shed in Luzie was active and well-organised at the time of the survey. In Xume a shearing shed has been built, but was not in use at the time of the survey, whereas Mhlahlane does not have a shed. Therefore, the dummy 'active shed' includes both the effect of village and shearing shed. The farmers in Xume and Mhlahlane have a 0 score on this dummy, while the dummy is equal to 1 for the farmers of Luzie.

It is assumed that farmers who join the association are innovative and take wool production more seriously. The quantity of wool sold is taken as a proxy for the production level, where farmers with a larger amount of wool are assumed to have more reason to search for a more profitable market outlet. It is also hypothesised that farmers producing with a higher intensity are more likely to be association members (also shown in the higher productivity levels of farmers in Luzie). Further, farmers who have invested in Dohne Merino sheep (which can be considered as superior for the production of both wool and mutton compared to the local breed) are assumed to be more innovative and will therefore be more likely to become a member of the shearing shed. It is also assumed that gender has an influence on the membership of the shearing shed. Men are traditionally responsible for animal husbandry in the households. Finally, the number of cattle is entered as a variable to reflect the capital endowments of the farmer. It is assumed that if a farmer owns more cattle, he has more collateral at hand, and hence he can afford to take more risks.

Although one might suspect endogeneity of the model, personal field experience during the data collection phase and insights gained through other parts of the overall research project [see D'Haese, 2003] support the assumption that the composition of the flock (breed and number of sheep), its wool production and wool productivity are fixed farm characteristics in the short and medium term.

It is well documented that small-scale farmers in rural areas defy risks and take risk-avoiding decisions even if this would decrease the average return of inputs invested. Farmers are concerned about unstable and unpredictable production and prices, mainly because they know that losses and fluctuating income can cause large welfare problems, and that risk coping mechanisms such as bank loans are generally unavailable or inaccessible.

In particular, the farmers in the study area have very limited access to credit and information on market facts. Moreover, these farmers do not have title deeds on their land due to the communal land tenure system. Therefore, wool farmers in the Transkei area are constrained from expanding their flock in the short run. That is, investments in flock can take a long time. Taking this into account, it is reasonable to assume that the structural farm characteristics were not yet influenced by the renovations of the shearing sheds at the time of the implementation of the survey. Within the circle of poverty, this study is to be situated at the point where possible extra income and recent extension activities have not yet induced change in the capital investments on the farm.

Step 2. The Regression of the Revenue from Wool per Sheep

The revenue from wool per sheep is defined as the amount a farmer earned from selling wool for the whole season divided by the number of sheep in his flock. Transport and packaging costs have been deducted. It is expected that this revenue depends on the amount of wool produced per sheep and where it is marketed.[6]

The first regression tries to capture the effect of the amount of wool that is produced. The wool produced and the quality depends largely on livestock production factors, whereby the feeding regime and veterinary care are the most important factors. Both the number of hours grazing and the amount spent per sheep by the farmer on extra feeding, have been chosen as independent variables to reflect the feeding regime. It is assumed that the expenditure on veterinary care (this variable is defined as the expenditure on dipping, deworming and inoculation per flock divided by the number of sheep in the flock) positively influences the quality of the wool. In particular, scab affects both the amount of wool a sheep produces (due to scab the wool will come out) and the quality of the wool itself. Dipping and inoculation are of major importance to counter the losses from scab. The

infection by worms affects the health of the animal and thereby reduces the production and quality of the wool. Other independent variables in the regression are the labour force and the number of sheep. Both indicators are considered structural characteristics of the farm, as shown in D'Haese [2003].

It is clear that the regression could have taken the variables introduced in the probit model into account, that is, breed and intensity of production. As will be shown in the next section, these variables were undoubtedly highly correlated with the participation to the association. Because of the high level of multicollinearity, introducing one of these variables in the regression would account for variability which is explained by the membership of the association.

Step 3. The Regression of the Residual over the Membership of the Association

To check the importance of the membership of the association on the revenue from wool, we analysed how much of the residual from the above regression can be explained by the membership of the association, and therefore by all the variables which influence this membership. With a second regression we explore how much of the residual, which is the variability unexplained by the variables in the first regression, can be accounted to the membership of the association. By introducing the Inverse Mills Ratio, we measure the impact of self-selection.

These are all the variables that are significant in the probit model calculated in step 1. Thus, the residual of the regression in step 2 becomes the dependent variable, while the independent variables are the membership of the association and the Inverse Mills Ratio. The next section presents the results of the analysis.

IV. EMPIRICAL RESULTS

Comparison Between Members and Non-members

An independent samples t-test shows that farmers who are members of the shearing shed realise a higher revenue from the sales of wool per sheep, than farmers who are non-members (the t-test results show the non-equality of the revenue from wool at a confidence level of 95 per cent) (Table 1). Furthermore, a relative higher amount of wool is produced on the holdings of members of the association and the price per kg wool paid to the farmer is higher.

The Probit Model

Table 2 presents the explanatory variables that are entered into the probit analysis. It is hypothesised that variables linked to an active shed, breed,

amount of wool sold and amount of wool per sheep have a positive sign, whereas gender is hypothesised to have a negative sign. The sign of cattle cannot be hypothesised and is considered an empirical issue. A positive sign would indicate that cattle are considered to reflect capital endowment. On the other hand, the sign could be negative if cattle and sheep are in competition for the farmer's capital. It would mean that the higher the number of cattle a farmer owns, the less he invests in sheep and therefore the smaller the probability of becoming a member of the shearing shed.

TABLE 1
COMPARISON OF THE MEAN VALUE OF FINANCIAL INDICATORS FOR WOOL REVENUE BETWEEN NON-MEMBERS AND MEMBERS OF THE SHEARING SHED

	Non-member (n = 60)	Member (n = 30)	t-value	p-value
Revenue from wool per sheep (R/sheep)	2.62	9.25	- 6.789	0.000
	(n = 61)	(n = 32)		
Price per kg for wool received (cR/kg)	135.86	408.85	- 8.468	0.000
Price for wool excl. shearing costs (cR/kg)	135.45	408.41	- 8.460	0.000
Amount of wool sold (kg)	43.34	161.56	- 4.078	0.000

The estimated model is highly significant with a w^2 of 48.54 (p-value ¼ 0.000). The set of explanatory variables was checked for multi-collinearity, which did not reveal high degrees of correlation between the independent variables. Results are shown in Table 3. The model accounts for

TABLE 2
DESCRIPTION OF THE VARIABLES ENTERED IN THE PROBIT MODEL

Value of the dichotomous variable	0	1
Active shed	Shed inactive	Shed active
Gender	Male	Female
Breed	Local breed	Dohne Merino
Continuous variables		
Cattle	Number owned by the farmer	
Kg wool per sheep	Quantity of wool produced per sheep (kg /sheep)	
Kg wool	Total quantity of wool produced (kg)	

TABLE 3
PROBIT MODEL RESULTS WITH SHEARING SHED PARTICIPATION AS DEPENDENT VARIABLE (n ¼93)

Variable	Estimate	Standard error	t-ratio	P[|Z| < z]	Marginal effect
Active shed	1.076	0.448	2.400	0.016	0.415
Gender	- 1.111	0.390	- 2.846	0.004	- 0.429
Cattle	- 0.056	0.022	- 2.544	0.011	- 0.022
Breed	1.506	0.503	2.995	0.003	0.582
Kg wool per sheep	- 0.476	0.156	- 3.044	0.002	- 0.184
Kg wool	0.006	0.002	2.356	0.018	0.002

Statistics:
X^2 = 48.54 Significance level = 0.000
Maximum unrestricted log likelihood = - 54.595
Restricted log likelihood = - 59.865
Degrees of freedom = 5

	Predicted		
Actual	0	1	Total
0	54	7	61
1	9	23	32
Total	63	30	93

82.8 per cent correct predictions, while the best naïve prediction would yield 65.5 per cent chance on a correct estimation.

The results of the probit model show that the probability that any farmer adheres to and uses the local association increases as an active shed is present in the neighbourhood. When visiting the Transkei area, we noticed a large difference between the three villages under investigation, namely the lack of support in Xume and Mhahlane compared to Luzie. It became clear that the level of trust and cooperation among the farmers in Luzie was higher compared to the other villages; or in other words, Luzie has a more 'civic community'.

The model confirms that in the Transkei area men are responsible for taking the production decisions on livestock. The men own the sheep and although women will take care of the flock, their husbands have the final say about the cattle and sheep.

The number of cattle was introduced into the model to reflect the farmer's capital endowments. The results indicate that the more

cattle the farmer keeps, the smaller the probability he will be a member of the local woolgrowers' association. If the farmer takes sheep farming seriously, he will invest in his sheep flock at the expense of cattle breeding. Furthermore, cattle are in competition with sheep for feed and veterinary care. The coefficient of the breed in the probit model provides strong evidence that Dohne Merino sheep owners have a higher probability of becoming members of the shearing shed. From the surveys it became clear that the choice of investing in Dohne Merino sheep was taken prior to the installation of the new shearing shed. It can therefore be assumed as a structural characteristic of the farm.

Production intensity has an adverse effect on the probability of being a member of the shed as the amount of wool produced per sheep yields a negative effect. The probit model suggests that farmers producing less wool per sheep have a larger probability of being members of the local association. On the other hand, farmers with a larger wool production have a higher probability of being members of the local association. Those farmers are apparently aware of the higher price they could receive if they market through the shearing shed. Farmers with larger wool production have a higher probability of being a member of the local association.

The estimated coefficients in Table 3 should be interpreted with care. The estimated coefficients of a probit model should be interpreted as the rate of change in the log odds as the independent variable changes. We therefore provide the marginal effects in the last column of Table 3. For dummy variables, these effects are computed as the discrete difference between the predicted probability when the variable is changed from zero to one. For continuous variables, the effect is the estimated change in the predicted probability from a unit change in the variable. The results show that from the three discrete independent variables (active shed, gender and breed), the breed of sheep has by far the largest marginal effect. The availability of an active shed and gender have similar marginal effects in absolute value. The former result confirms our first hypothesis.

We also found a positive relationship between the probability of being a member of the local association and the revenue from wool (Figure 2). This relationship is analysed in more detail in the regression model presented in the next section.

Regression of the Revenue from Wool

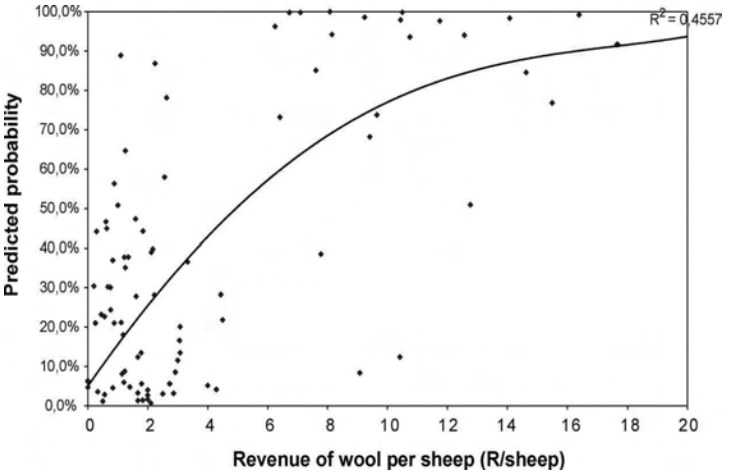
The regression of the revenue from wool yields an R^2 of 0.482

(Adjusted R^2: 0.451). The regression model is significant as indicated by the F-statistic. The coefficients of the expenditure on veterinary care and the hours of grazing are positive and statistically significant (Table 4). This was expected because in communal grazing systems, many productivity problems are caused by infectious diseases and poor (collective) grassland management.

The expenditure on supplementary feed and the number of employees are not significantly influencing the revenue from wool. Also the coefficient of the size of the flock is not significantly different form zero.

The latter can be explained by the observation that the sheep are held for multiple purposes and not only for wool. It would suggest that the larger farms are equally interested in keeping sheep for mutton, and not merely for wool. Yet, interestingly, the above results of the probit model indicate that

FIGURE 2
RELATIONSHIP BETWEEN REVENUE FROM WOOL PER SHEEP AND THE PREDICTED PROBABILITY OF MEMBERSHIP OF THE ASSOCIATION



the amount of wool produced on the farm is important for the membership of the association.

Regression of the Residual on the Dummy of Participation to the Local Association

Table 5 shows that the residual of the wool revenue regression can partly be explained by the participation of the local association.

Furthermore, the coefficient of the Inverse Mills Ratio is not statistically significant at a 95 percent confidence level. This indicates that at this level of confidence the

TABLE 4
REGRESSION OF THE REVENUE FROM WOOL (R/SHEEP) (n = 90)

Variable	Unstandardised		t-value	p-value
	Estimate	Standard error		
Constant	- 10.451	2.278	- 4.589	0.000
Expenditure on supplementary feed (R/sheep)	- 0.078	0.103	- 0.762	0.448
Expenditure on veterinary care (R/sheep)	0.117	0.037	3.167	0.002
Grazing (number of hours per day)	1.352	0.259	5.215	0.000
Labour (number of employees)	0.825	1.306	0.631	0.530
Sheep (number of sheep)	0.006	0.007	0.901	0.370
Statistics:				
$R^2 = 0.482$	R^2 adjusted = 0.451			
F = 15.62	Significance level = 0.000			

TABLE 5
REGRESSION OF THE UNSTANDARDISED RESIDUAL FROM THE SHEARING SHED PARTICIPATION AND THE INVERSE MILLS RATIO (n = 90)

Variable	Unstandardised		t-value	p-value
	Estimate	Standard error		
Constant	- 0.140	0.598	- 0.234	0.815
Membership of the association	2.128	1.088	1.956	0.054
Inverse Mills Ratio	2.245	1.347	1.667	0.100
Statistics:				
$R^2 = 0.229$	R^2 adjusted = 0.209			
F = 11.438	Significance level = 0.000			

estimate of the local association participation decision dummy is not biased by non-controllable variables and hence, is not overestimated [Warning and Key, 2002].

The significant and positive estimate of membership of the local association shows the importance of membership of the shearing shed on the revenue from wool and confirms our second hypothesis. The results from the t-test shown in Table 1 and the probit model suggest that the participation decision can be associated to a higher production of wool that is sold on a more profitable market at a higher price per kg. Unfortunately, data on the trading costs is lacking for both members and non-members of the association. It is therefore not possible to isolate the transaction costs and mark-up on the price deducted by the traders or brokers. Yet, the price differentials, and the positive impact of the participation in the association on the revenue from wool can be explained by a combination of several factors contributing to a conducive market environment. We elaborate on this in the next section.

V. DISCUSSION

Several authors have argued that adding value to a tradable product can be accomplished by the adherence of smallholder farmers to a better-organised and more productive marketing chain [Staal et al., 1997; Readon and Barrett, 2000]. For farmers in the Transkei area, the building of a new shearing shed and the introduction of a local wool producer organisation creates such new marketing chain opportunities. Our empirical analysis shows that if smallholder farmers get access to a more profitable market in a more efficient chain, they can benefit as a result of the higher selling price.

Dijkstra, Meulenberg and van Tilburg [2001] categorise the reasons for success of a new actor in a market channel into effectiveness, efficiency and equity. First, the shearing shed has the potential to increase the effectiveness of marketing; by bulking the produce, average costs are lowered. The average cost of asset accumulation decreases. The bargaining power of the cluster of farmers is higher and access to information is better and cheaper which contributes to lower transaction costs. Uncertainty caused by disguised information will decrease and there is less risk of opportunistic behaviour by the buyer [Williamson, 1971, 1996]. In the cluster, farms can expand and integrate the marketing of wool. Selling directly to brokers by a cluster of farmers will be more effective. The collective marketing of wool gives the farmers the opportunity to overcome the constraints which withheld them to contact the brokers, because it overcomes the problems of power and accountability of a smallholder on his (or her) own. This implies that

the transaction costs are decreased: first because of a better information flow; second as the bargaining power of the farmers is increased which rationalise negotiation and contracting costs; and finally not in the least, because farmers 'feel' less at risk for malfeasance of the brokers.

Second, clustering harvest and post-harvest handling and marketing may increase efficiency. Schmitz and Ndavi [1999] advocate that clustering increases collective efficiency. This is the sum of passive and active collective efficiency, defined as the competitive advantage derived from external economies and joint action respectively. Joint action will substantially decrease average costs of harvest, post-harvest handling and transport of wool. Bales of wool can only be collected if sufficient sheep are shorn. Even if the farmers who are members of the local association do not present higher technical efficiency, their revenue from wool is higher, resulting in a greater allocative efficiency.

Third, the shearing shed, by virtue of bulking the wool produced, will increase equity and the bargaining power of farmers [Dijkstra et al., 2001]. As wool production by the individual farmer is low, brokers are not interested in contracting with them. The bulking of the wool at the level of the shearing shed, however, attracts the brokers. Farmers as a group are less at risk from opportunistic behaviour by the buyer, who might otherwise dictate the terms of the contract [Williamson, 1971]. The farmer hence becomes capable under the auspices of the shearing shed of bargaining and haggling over the sales contract.

The importance of the community on the success of the membership explains how social capital can support investments in physical and human capital [Putnam, 1993]. Putnam [1993] describes civic communities by their value for solidarity, civic participation and integrity and the trust in one-another 'to act fairly and obey the law'. This is of great importance for the good functioning of informal institutions under traditional leadership, as is the case in the Transkei area, where the communities are based on solidarity among the villagers.

The organisation of the local association also entails new costs and time that has to be invested. However, the extra transaction costs this would cause are less than those of the same transaction by means of an exchange on the spot market (Coase [1937] was the first to describe this). The transactionsbetween the farmers and the shed also imply both explicit and implicit costs. The shearing shed can be seen as a new institution in the supply chain, a result of the vertical disintegration of the

market channel, one which provides a number of services to the farmer. It is assumed that explicit organisation costs are low, because the National Woolgrowers' Association and the government financed the shearing shed.[7] Nevertheless, new transaction costs within the local association may arise[8] because new rules between the members and the shearing committee have to be set and monitored. Contracts between association members also need to be made.

This will inevitably increase the fear for opportunistic behaviour. As previously stated, farmers are paid after the wool is sold on the auction with the shearing committee being responsible for the distribution of profits. This is a sensitive issue because although the wool is graded after shearing and the amount of wool of each grade is recorded per farmer, farmers do not know their exact sales revenue at the time the wool leaves the shearing shed. Not all farmers trust the system, which explains why even in Luzie with an active shed not all farmers are members of the association. It is therefore argued that acceptability of institutional arrangements to all the farmers can be regarded as a key success factor.

VI. CONCLUSION

The level and impact of the formation of a local woolgrowers' association implies that new institutional arrangements have to be made between the farmers who will use the joint investments. The new trade association can increase the access to a more remunerative market by creating a new marketing chain thanks to new arrangements with trading partners. Institutional innovation merits support because of its proven effectiveness in raising farmer's income and because the prevailing production and marketing environment may not give the necessary incentives or resources.

Once the local association and the new supply chain are established, a combination of bulking and better contacts may increase farmers' income because of a higher production and net selling price. In the case of wool, the bulking of shearing, post-harvest handling and marketing lower the costs. The farmers have more bargaining power and the transaction costs are lowered for individual farmers because of lower costs of planning, monitoring and negotiation.

In short, institutional innovation supported by government is relevant when market failures constrain the farmers to commercialise. New institutional arrangements and trade organisations may create a conducive production and trade

environment. The increased production and increase of the net selling price contribute to a higher revenue and better income for the farmers, thus providing opportunities for greater development in poor rural areas.

NOTES

1. The figures mentioned in the above paragraph are calculated from the production in the season 1999/2000.
2. Transaction costs are costs implicit to trading, and include search (information) costs, negotiation costs and monitoring and enforcement costs [Hobbs, 2003]. Specific assets are assets that cannot readily be used in another production, whereas co-specific assets are assets of which the returns depend on the active cooperation of others.
3. The income effect of the association is measured through its impact on the revenue from wool. It is thus assumed that the association's main effect is on the selling price of the wool, more than on the farm's cost structure. This is shown in extensive analyses reported by D'Haese [2003]. It has been impossible to isolate the costs for wool production from the total costs for the sheep.
4. Based on Heckman [1979], also reported in Greene [2000] and extensively discussed in Maddala [1983]. Similarly, this approach was set forth by Key and McBride [2001] and Warning and Key [2002] in their study of the effect of contracts on farm income. The approach has also been applied to comparing institutional arrangements in Masten, Meegan and Snyder [1991]. Masten et al. [1991] further mention applications in Lee [1976] and Nelson [1977].
5. The influence of the quality of the wool presents a specific problem. When wool is sold through the local traders, the wool is not sorted, so that the quality does not have any significant contribution to the price. It is furthermore argued, and confirmed by interviews with brokers buying the wool from the sheds, that the wool supplied by the sheds is mostly from a coarse and coloured type. The quality differentials between the farmers are small. The largest difference is seen between the members (wool graded) and non-members (wool sold in bulk).
6. Yet, the opportunity costs of time of the organising committee are very difficult to assess.
7. In the same way as vertical integration of firms decreases transaction costs (references are given in Williamson and Masten [1999]), the vertical disintegration may bring about new costs.

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