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TENURE ARRANGEMENTS AND SMALL-SCALE FARMERS IN THE

F.D.K. Anim¹

Department of Agricultural Economics, University of the North

H.D. van Schalkwyk¹

Department of Agricultural Economics, University of the Orange

It has been argued that indigenous land tenure arrangements (watering points) and the ability to finance such investment owners in the Northern Province are analyzed. The results in restrictions on the use of the common resource, earn more ne to have access to credit as compared with those stockowne commons. The results have some positive implications for communal grazing areas in South Africa.

1. INTRODUCTION

The complex nature and state of agriculture in Sub-Saharan Africa in recent years has set debate over the suitability of customary land tenure for capital intensive agriculture (Migot-Adholla and Bruce, 1994). Dornier (1972) has questioned the appropriateness of customary tenure systems for capital intensive agriculture and the adoption of new technologies. During the 1980s, many researchers (i.e. Boserup, 1981; Cohen, 1980; Noronha, 1985; Feder and Noronha, 1987; Bruce, 1981; etc), raised serious questions about the rigidity of customary land tenure systems. They suggested that indigenous tenure systems are dynamic and have historically adapted to economic and technological changes. However, Binswanger and McIntire (1987) characterized the typical stages of transformation from more diffuse and collective to more specific and exclusionary individual rights and concluded that the trend towards increased privatization provides the necessary incentive to invest in the particular land. From this and other observations, it is evident that indigenous tenure arrangements may not be entirely inimical to capital intensive agriculture. Harisson (1978) however contends that because customary tenure systems are deeply embedded in cultural and political systems and generally offer members of particular social groups overlapping multiple rights of land use, they tend to exclude nonmembers of use rights of the land. According to Migot-Adholla and Bruce (1994) these processes of customary tenure arrangements distort factor markets and undermine full integration of rural economies into national and international markets. In addition, because they permit partible inheritance, customary tenure systems contribute to land fragmentation and encourage uneconomically wasteful litigation. Anim and Lyne (1994) also found that in rural areas of the former Ciskei, private access to communal grazing land was more or less limited to those households or individuals who have influence on the local chiefs.

To remedy these problems, development specialists in South Africa and elsewhere have favoured intervention programmes of land reform aimed at changing rules governing access to land and introducing new institutions of land administration. For example, Lyne and Nieuwoudt (1990) suggest privatization of communal grazing land as the only solution to investment problems while Vink (1986), on the other hand, suggests an institutional approach to livestock production in communal grazing areas in South Africa.

Non-property (or open access): Non-property refers to a type of property institution where there are no defined users or 'owners' and so the benefit stream is available to anyone (Wilson and Thompson, 1993). Individuals have both privilege and no right with respect to use rates and maintenance of the asset. The asset is an 'open access' resource (Bromley and Cernea, 1989; Anim and Lyne, 1994). Under this regime, no individual is excluded from the use of the resource or its benefits and this is equivalent to there being no property rights at all (Lyne and Nieuwoudt, 1990). The individual rights of inclusion therefore depend on rights of the group or community to exclude others. It is for this reason that 'open access' has been accurately described as "everyone's property or nobody's property" (Baber, 1991).

Open access to a resource implies the absence of restrictions affecting its use (Wilson and Thompson, 1993). It is the restrictions that define the various rights, ranging from open access through common property and finally to private property regimes, but whatever the arrangements, a departure from unrestricted open access to a structure of well defined use rights results in agreement with a minimum coalition. This call for the observation of the restrictive rules (Runge, 1981). Thus the process of forming restrictive rules involves reaching agreement and if all possessors of the rights to the resource reach consensus then the need for coercion and the social costs of enforcing the regime will be much reduced (Runge, 1985). Runge (1985), also views the decision of a person on whether or not to cooperate in observing a rule as a binary choice with externalities. It is binary because the choice is between cooperation and defection with external effects because a decision to cooperate or not alters the benefits of the resource by the other agents (Runge, 1985). In the study area, this type of property regime was the most common and has arisen due to the history of traditional arrangements but more importantly due to population pressure on land. This type of property regime was selected for comparison with groups schemes (common property and communal tenure systems).

Common property: Common property refers to the situation where the management group (the 'owners') have the right to exclude non-members, and non-members have a duty to abide by exclusion (Hardin, 1968). Individual members of the management group (the 'co-owners') have both rights and duties with respect to use rates and maintenance. Common property is characterised by a number of rules and conventions that regulate the use of the resource and is importantly characterised by restricted access (Anim and Lyne, 1994). Common property is not everybody's property but it is owned by a finite and distinct group of individuals (Baber, 1991). An individual's right to the benefits from a jointly held resource are dependent upon the membership of, or acceptance by the group or community. The community or joint owners have the right to exclude non-members (Baber, 1991). In the study area this type of property regime was found to be acceptable to the community and seemed to be emerging in diverse forms, for example, in the form of group schemes, but appear to attract mostly elite farmers rather than the subsistence farmers in the area. Since the present land reform policies encourage this type of tenure arrangement, farmers in this group were selected for analysis.

3. DATA COLLECTION

Three agricultural districts in the Northern Province were selected for the study: Nebo, Sekhukhune and Thabamane.

Hussain *et al*, 1994). The two most popular cumulative distribution functions (CDF) commonly chosen to model regressions where the response variable is dichotomous:

- (i) The Logistic CDF (Logit model); and
- (ii) The Normal CDF (Probit model or Normit model) (Gujarati, 1988:480).

A logit model is used because its underlying assumptions are less restrictive than those of other methods. Additionally it is free from the problems attendant with the use of OLS or GLS. Discriminant analysis is also another possibility but is rejected at this stage because it assumes the existence of two distinct population groups (Gordon *et al*, 1994) as in the first analysis where two groups of stockowners (open and communal access) were considered. Probit analysis is a third potential estimation technique but it is also not used in this paper because as noted by Gordon *et al* (1994), the distributional assumptions necessary to validate the probit analysis are frequently not fulfilled in econometric models. A logit model however is more appropriate because it enables one to hypothesize that there is some probability of an incidence occurring at any given circumstance. In the logit model, it is assumed that the odds of the dependent variable are a log-linear function of the exogenous variables, X_i , of the form:

$$L_i = \ln(p_i/1-p_i) = \beta X_i + \mu_i$$

where

- L_i = the log of the odds ratio (Logit);
- p_i = a column vector of exogenous variables;
- β_i = a row vector of slope coefficients;
- X_i = independent variables in the equation; and
- μ_i = error term (Gujarati, 1988:480).

The hypothesized logistic regression model can be expressed as follows:

$$\text{Access to credit} = \beta_0 + \beta_1 \text{ Tenure} + \beta_2 \text{ Net farm income}^1 + \beta_3 \text{ Watering points} + \beta_4 \text{ Net off-farm income} + \text{Control variables} + e$$

where

- β_0 = constant;
- β = weighting coefficients; and
- e = error term.

The coefficients of "Tenure", "Net farm income", and "Watering points" are expected to be positive, while that of "Net off-farm income" is expected to be negative.

5. RESULTS

5.1. Socio-economic characteristics of stockowners

From the definition of open and common property arrangements, stockowners in the study area were grouped into two i.e. those operating under open access and under common property arrangements. Out of 134 respondents 87 stockowners operated on open access while 47 were on common property grazing (Table 1).

There are more male stockowners with common property access to grazing than those on open access. Stockowners on open access grazing are older, the majority are married, and they have more children than those on common property grazing.

Table 1: Socio-economic characteristics of stockowners

Variable	Units
Sex (=1, male; =0, female)	%
Age	years
Marital status (=1, married; =0, otherwise)	%
Number of children	%
Use of mass media (=1, if access to radio and TV; = 0, otherwise)	%
Private investment	(R/year)
Net farm income	(R/year)
Net Off-farm income	(R/year)
Access to credit (= 1, if access to credit; = 0, otherwise)	%
Number of cattle owned	
Fencing (= 1, if invested in fencing; = 0, otherwise)	%
Watering points (= 1, if invested in watering points; = 0, otherwise)	%
Pasture improvement (= 1, if invested in pasture improvement; = 0, otherwise)	%
Herd quality improvement (= 1, if invested in herd improvement; = 0, otherwise)	%
Good veld condition (=1, if veld was assessed to be 'good'; = 0, otherwise)	%

Table 2: Distribution of estimated value of private investment

Private investment (Rand/year)	Open access (n (%)
Less than 30 000	73,60
31 000 - 60 000	21,80
More than 61 000	4,60

Table 3: Selected variable correlations with tenure type of stockowner had open access to grazing land

Variable
Private investment
Net farm income
Net off-farm income
Number of cattle owned
Access to credit facilities
Fencing
Watering points
Pasture improvement
Herd quality improvement
Veld quality improvement

** P < 0,001; (1-tailed)

suggest that the odds of having access to credit facilities decreases with increasing off-farm income. An indication that those stockowners who depend on off-farm income in the area do not have to rely on credit facilities.

Table 4: Estimated logistic regression model

Dependent variable = Probability of having access to credit		
Number of observations: 134		
Variable	Estimated coefficient	s.e.
Tenure	4,90**	1,80
Net farm income	0,01**	0,00
Net off-farm income	-0,01	0,00
Number of cattle	0,06	0,05
Fencing	1,95	1,61
Watering points	2,43*	1,27
Pasture improvement	7,27	28,30
Herd quality	0,74	1,62
Good veld condition	1,38	1,19
CONSTANT	6,48**	1,60
-2 Log likelihood		Chi-square
Model Chi-square		44,9
Improvement		134,8
Goodness of fit		135,8
		95,5
Access to credit correctly classified		
Non-access to credit correctly classified		
Overall percentage of 134 cases correctly classified		

** P < 0,01; * P < 0,10

lesser extent, exclusive rights to the resource, and its rents accrue to the group as a whole. They could have been able to obtain credit from the government or financial institutions.

A statistically non-significant -2LL (minus two log of the likelihood), indicates the predicted model is not significantly different from the perfect model (Barlow and Nieuwoudt, 1995). The goodness of fit statistic which compares observed probabilities with those predicted by the model is not significant. In other words, the observed probabilities are not significantly different from those predicted by the model. An indication that the model is reliable (Norusis, 1990:52). The improvement statistic tests the null hypothesis that coefficients for variables added at the last step are zero (Norusis, 1990:5).

The classifications of access and non-access to credit groups are very high (96,30% and 90,57% respectively). The function also correctly classified a total of 94,03 per cent of the 134 cases in each group (when prior probabilities reflected relative group sizes). These results enforce the goodness of fit statistic (Barlow and Nieuwoudt, 1995). The high values of the Wald statistic for "Tenure", "Net farm income", and "Watering points" suggest that amongst the non-control variables, these variables are significant and have relatively high partial contributions to access to credit. The results indicate that tenure arrangements, net farm income, and investment in watering points are highly significant contributors of stockowner's access to credit in the study area. However, net off-farm income is not. These results seem to support the economic argument that tenure and group arrangements influence the ability to finance investments in improvements through borrowing.

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

Empirical evidence in this study shows that user groups are likely to benefit from access to credit facilities for investment. Higher farm income is also likely to influence

could be farmed exclusively by a hired manager or by the farmers with the proceeds distributed as both cash dividends and services to the co-owners (Lyne, 1996).

NOTE:

1. F.D.K. Anim is currently researching this topic as a PhD thesis at the University of Pretoria. H.D. Schalkwyk has been on the staff of the University of Pretoria when this paper was written.

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