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*Full Length Research Paper*

# An analysis of institutional and technical factors influencing agricultural marketing amongst smallholder farmers in the Kat River Valley, Eastern Cape Province, South Africa

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**Smallholder farmers in the Kat River Valley do not use output markets effectively due to a number of factors. The technical and institutional factors that demoralise them from marketing are identified in this paper. It is asserted that an explicit analysis in the relationship between technology, institutions and markets may be useful in developing livelihood improving programs. Therefore, by identifying such factors, the paper seeks to find out ways of improving market participation among the smallholders, hence, livelihood development. The multinomial regression model was used to investigate the factors that influence marketing choices among smallholder and emerging farmers in the area under study. Empirical results show that market information, expertise on grades and standards, contractual agreements, social capital, market infrastructure, group participation and tradition significantly influence household marketing behaviour.**

**Key words:** Smallholder farmers, market participation, institutional and technical factors, multinomial logistic regression model.

## INTRODUCTION

In the age of trade liberalization and globalisation, the world markets are increasingly being integrated. This implies that farmers in the developing world are ever more linked to consumers and corporations of the rich nations. Consequently, local farmers are facing increasing market competition, not only in international markets, but in local markets as well. In an effort to withstand the market pressures, agricultural markets are now transforming to a vertically coordinated structure (Reardon and Barrett, 2000). Also, both the private and public sectors have made some adjustments in agricultural markets, in order to survive competition resulting from market changes.

The South African agricultural sector was deregulated in 1997, with the aim of creating an open and market-oriented environment for boosting the sector. Based on the Agricultural Products Act of 1996, government intervention in agricultural marketing through the use of control boards was ceased. This change resulted in smallholder farmers and other formerly deprived farmers in output markets being included in agricultural marketing (Meyer et al., 2002). Although the policy is now oriented in favour of smallholder farmers, they still have to compete for markets with the already developed commercial sector. For this reason, their survival in the markets is still at stake. In output markets, smallholder farmers often faced with difficulties in enforcing contracts and meeting stringent food safety norms, lack skills, are located in remote areas and mostly rely on middlemen. They are also served by poor physical infrastructures and weak institutions in markets (Kherallah and Kirsten, 2001; Makhura, 2001). Understanding such challenges among smallholder farmers is important in identifying areas that need focus and direction for improvement. In the light of these challenges, suggestions can be made on how to

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improve smallholder farmers' 3 participation in output markets

The main objective of this study is to identify and assess the technical and institutional factors influencing agricultural market participation behaviour amongst smallholder farmers in the Kat River Valley of the Eastern Cape Province in South Africa. The study focuses on the factors that compel smallholder farmers to make certain marketing decisions. Thus, it considers factors that guide farmers in deciding whether to sell produce or not. It further looks at the factors that influence the choice of marketing channels when selling produce.

## CONSTRAINTS TO AGRICULTURAL OUTPUT MARKETS

Markets are important because they act as a mechanism for exchange. They are particularly important to the poor, because their involvement in the use of markets results in co-ordination and allocation of resources, goods and services. In other words, markets are very important in reducing poverty and improving livelihoods of households. It follows that market participation is important amongst smallholder farmers because households derive benefits such as income and open opportunities for rural employment (Dorward et al., 2003; Machethe, 2004). In addition, marketing activities such as processing, transportation and selling can provide employment for those willing to exit the farming sector. At the national level, Lyster (1990) identified that market participation is important both for sustainable agriculture and economic growth and for the alleviation of poverty and inequality. Unfor-tunately, smallholder farmers face difficulties in accessing markets, as a result, markets fail from effectively performing their duty. It is central to this paper to identify barriers that hinder markets from serving the interests of smallholder farmers, giving special attention to institutional and technical factors.

In South Africa, less developed rural economies and smallholder farmers find it difficult to participate in commercial markets due to a range of technical and institutional constraints. Factors such as poor infrastructure, lack of market transport, dearth of market information, insufficient expertise on grades and standards, inability to have contractual agreements and poor organisational support have led to the inefficient use of markets, hence, commercialisation bottlenecks.

### Institutional aspects in smallholder agricultural markets

Institutions are defined by North (1990) as rules of the game that facilitate coordination or govern relationships between individuals or groups. North (1990) divided institutions into formal and informal institutions. Institutional aspects and their role in marketing and economic development revolve around transaction costs, market information flows and the institutional environment. It is affirmed that smallholder farmers in developed rural economies lack adequate market information and contractual arrangements, lack lobbies in the legal environment and are not easily receptive to changes (Delgado, 1999; Kherallah and Kirsten, 2001). These factors result in high transaction costs, hence difficulties in formal market participation. This line of argument is substantiated by Makhura (2001) who explained that when smallholder farmers are faced with high transaction costs, they will either stop participation in marketing or resort to other means of marketing such as spot markets. The use of spot markets may not be as rewarding to the farmers as formal markets are, mainly due to traders' opportunistic behaviour. In addition, spot markets are becoming less popular in the liberalised environment. To sum up, owing to institutional aspects, smallholder farmers face difficulties in accessing formal markets. This calls for institutional development among this group of farmers.

### Technical aspects in smallholder agricultural markets

Technical changes in marketing can be viewed as those transformations that allow goods to be available on the market at lower costs and diversification of markets. Technical changes are usually influenced by the organization, and regulation and advances in technology, but technical changes are closely linked to technological development. In agricultural production and marketing, smallholder farmers are still lagging in the use of improved technology (Carre` and Drouot, 2002). Machethe (2004) pointed out that most small producers in South Africa lack appropriate transportation facilities and road infrastructure, communication links and storage infrastructure. Further, smallholder farmers have limited ability to add value to their produce. Lack of such facilities usually constrains farmers' supply response to any incentives in both agricultural production and marketing (Dorward et al., 2003). Moreover, poor roads and poor telecommunication networks results in high transaction cost (Fenwick and Lyne, 1999). Sometimes these costs are too high for farmers and traders to get any meaningful benefits from their trading activities, thus discouraging farmers from marketing activities. For this reason, institutional development has to be accompanied by technological changes, in order to sustain market participation among smallholder farmers.

## METHODOLOGY

This section reviews the research methods used in collecting and analyzing data from smallholder farmers in the Kat River Valley. The section is intended to show how the study was conducted using research tools. It starts by describing the study area, and then it explains the sampling technique and the sample size from which data was collected. The methods of data analysis and model specifications follow, outlining the model for data processing, and

giving reasons why the model has been chosen.

**Study area**

Kat River Valley is located in the Eastern Cape Province, the second largest of the nine provinces in South Africa (Ngqangweni, 2000). It is situated northeast of Grahamstown, in the foothills of the Winterberg and the Amatole Mountains (Magni, 1999). The Kat River Valley forms part of the Nkonkobe Local Municipality, which falls, under Amatole District Municipality. Before the change of government in 1994, the upper part of the Kat River Valley was part of the Ciskei homeland – one of several black racial reserves created during the apartheid era. The Kat River Valley is approximately 80 km in length and 1700 $km^2$ in area (Motteux, 2001). Its catchment includes the areas of Seymour, Balfour, Fort Beaufort and other smaller rural communities.

Kat River Valley's altitude increases from approximately 600 to 1600 m at the top of the escarpment (Shackleton and Shackleton, 2006). Its climate can be described as mild (Magni, 1999) . Rainfall is unevenly distributed within the area. It ranges between 400 and 1200 mm, where the least rainfall is received at the confluence with the Great Fish River and the highest, in the mountainous northern region of the catchment (Magni, 1999). The rainfall is relatively high in the mountainous region, but much of the area in the catchment can be regarded as sub-humid to semi-arid. Kat River Valley receives both summer and winter rainfall. Approximately 75% of the mean annual precipitation is received between October/November and February/March, where the highest rainfall figures are recorded in March. The temperatures range from moderately hot summers to cool moderate winters (Motteux, 2001).

Population in the Kat River Valley is composed of different races, and the racial composition is the result of history and apar-theid. The Upper and Middle parts of the Kat River Valley belong mainly to black *Xhosa* speakers and coloured Afrikaans speakers, whereas the Lower part belong mainly to white English speakers. Of the total population in the area, approximately 94.28% are black *Xhosa* people, 4.12% coloured and 0.76% white (Motteux, 2001).

Kat River Valley is characterised by a variety of land uses, ranging from export-oriented citrus farming, commercially oriented rangeland stock farming to small-scale vegetable and crop production and stock farming (McMaster, 2002). Commercial farmers are mainly located in the Middle and Lower Kat, whereas smallholders and emerging farmers mostly practise agriculture in the Upper catchment (Nel, 1998). Vegetable gardening is an important occupation amongst smallholder farmers in the area. Most of these vegetables are grown on fertile plots lying adjacent to rivers and streams. For watering the vegetables, some farmers practise sprinkler irrigation, whereas the farmers who lack irrigation infrastructure practise hand irrigation (Farolfi and Rowntree, 2005). The soil, on which most cultivation occurs in the valley, is alluvium, which is suitable for agriculture. Smit (2003) explained that even though the soil is suitable for agriculture, phosphorous and potassium deficiencies have been identified in the alluvial soil profiles of the Kat River basin.

There is a corresponding change in vegetation from Eastern Thorn Bushveld dominated by *Acacia karroo* in the valley, to a more succulent thicket in the south. The *Acacia* bush is the predominant vegetation type at the valley bottom owing to lower rainfalls. This vegetation type is capable of supporting livestock, explaining animal farming in the area. *Acacia* bush is also suitable for game farming, even though the area has not yet gained tourism importance from the four game reserves in the area (Motteux, 2001). Apart from different farming types, lack of sufficient rainfall remains a limiting factor to agricultural development in the catchment. In addition to rainfall problems, environmental problems in the Kat River Valley include over-fertilization, litter, water-pollution, erosion and river siltation, reduced tree and grass cover and increasing sediment output (Smit, 2003).

**Sample and sampling techniques employed in the study**

Data was collected from a sample of smallholder farmers who are producing a marketable surplus in the Kat River Valley. Farmers were stratified according to farming types: cattle and vegetable farmers. Eighty six farmers were randomly selected for the survey, where 43 each were cattle and vegetable farmers. The sampling frame from where the farmers were selected was obtained from extension officers. A questionnaire was then administered to the sampled household heads through face-to-face interviews. In the absence of the head, the spouse or any family member who is directly involved in the farming activities and management was interviewed.

**Methods of data analysis**

Statistical Package for Social Scientists (SPSS version 15.0) was used to run the data collected from smallholder farmers. To analyze relevant data, descriptive statistics were used together with the multinomial logistic regression model. The main descriptive indicators that were employed were frequency and mean values.

The multinomial logistic regression model was used to test the institutional and technical factors that influence households from using greater depth marketing methods which have the potential of increasing their incomes. Multinomial logistic regression can be used to predict a dependent variable, on the basis of continuous and/or categorical independent variables, where the dependent variable takes more than two forms (Hill et al., 2001). Logistic regression does not assume a linear relationship between the dependent variable and independent variables, but requires that the independent variables be linearly related to the logit of the dependent variable (Gujarati, 1992). However, Pundo and Fraser (2006) explained that the model allows for the interpretation of the logit weights for the variables in the same way as in linear regression.

The smallholder farmers under study are faced with three choices; formal-, informal- and non-market participation. It is assumed that these decisions are made on the basis of the option which maximizes their utility, subject to institutional and technical constraints.

As such, the utility maximizing function can be given as:

$$\text{Max } U = U(C_k, R_{fk}, R_{ik}; H_u) \quad (1)$$

Where; Max U denotes the maximum utility that can be attained from agricultural production
$C_k$ represents the consumption of produced goods by the household
$R_{fk}$ represents revenue gained from formal market participation
$R_{ik}$ represents revenue gained from informal market participation
$H_u$ represents a set of institutional and technical factors shifting the utility function

From the utility maximizing function, it can be seen that households make decisions to produce, consume and market, subject to institutional and technical factors. Therefore, if the costs that are associated with using a particular channel are greater than the benefits, households will be discouraged from using it, shifting to the option that maximizes their utility. In the utility function, the amount of good k that is consumed or sold does not have to exceed the amount that is produced. However, it is difficult to measure utility directly; therefore, it is assumed that households make participation choices depending on the option that maximize their

**Table 1.** Description of variables used in the model.

| Variable Label | Variable name | Coding of variable | Expected relationship |
|---|---|---|---|
| MKTINFO | Access to market information | 1 if access, otherwise 0 | + |
| GRDS | Expertise on grades and standards | 1 if yes, otherwise 0 | + |
| EXT | Access to extension contact | 1 if yes, otherwise 0 | + |
| ORGMEM | Member of an organisation | 1 if member, otherwise 0 | + |
| FMNGTYP | Type of farming | 1 if arable, 0 if livestock | +/- |
| RDINFR | Road infrastructure | 1 if good, 0 if poor | + |
| TRANS | Market transport | 1 if have own transport, otherwise 0 | + |
| ADDVAL | Ability to add value | 1 if yes, otherwise 0 | + |
| MKTINFR | Market infrastructure | 1 if good, otherwise 0 | + |
| STOR | Storage facilities | 1 if good, otherwise 0 | + |
| CONTRCT | Availability of contractual agreements | 1 if yes, otherwise 0 | + |
| SOCIALK | Availability of extensive Social capital | 1 if yes, otherwise 0 | + |
| PART | Groups or individual participation | 1 if group, 0 if individual | + |
| TRAD | Guided by tradition and beliefs | 1 if yes, otherwise 0 | _ |

utility. Thus, decisions to participate in either formal or informal markets or even not participating, signify the direction which maximizes utility. With the given assumption, multinomial regression was used to relate the decisions to participate in formal and informal markets or not participating and the factors that influence these choices.

A typical logistic regression model which was used is of the form:

$$\text{Logit}(P_i) = ln\,(P_i / 1 - P_i) = + {}_1X_1 + \ldots + {}_nX_n \quad (2)$$

Where; $ln\,(P_i / 1 - P_i)$ = logit for market participation choices
$P_i$ = not participating in markets
$1\text{-}P_i$ = participating in markets
X represents covariates

In the model, market participation choice represents the dependent variable where non-market participation has been set as the baseline group. Market participation choice describes the decision to market or not, and the variety of marketing methods (either formal or informal channels) used by households to market agricultural output. It follows that $P_i$ represents the probability of not participating in produce marketing and $(1 - P_i)$ represents either informal or formal market participation. In other words, the model was used to assess the odds of: informal market participation vs. not participating; and formal market participation versus not participating.

**Model specifications**

By fitting explanatory variables into the logistic regression model, the model is presented as:

$$ln\,(P_i / 1 - P_i) =$$
$$B_0 + B_1\,MKTINFO + B_2\,GRDS + B_3\,EXT + B_4\,ORGMEM$$
$$+ B_5\,FMNGTYP + B_6\,RDINFR + B_7\,TRANS + B_8\,ADDVAL$$
$$+ B_9\,MKTINFR + B_{10}\,STOR + B_{11}\,CONTRCT + B_{12}\,SOCIALK$$
$$+ B_{13}\,PART + B_{14}\,TRAD + Et$$

The description of the explanatory variables, and their expected relationships to the dependent variable are presented on Table 1.

The variable (MKTINFO) which reflects access to market information was measured by the household's ability to get market information in time and the ability to interpret it correctly. In order to capture this variable closely, households were interviewed on the communication networks that are accessible to them. Access to information has been set as a dummy variable, where a household with access to information takes the value of one and a household that has no access to information takes a value of zero. Access to information was expected to influence market participation positively; implying that households with access to information are more likely to participate in marketing, making use of formal markets. Another variable that is closely linked to information availability is access to extension services (EXT) such as access to farming advice and knowledge through extension officers. This variable was also allocated dummy values where households with access to extension services took the value of one and zero if otherwise.

Expertise on grades and standards (GRDS) was recorded in order to investigate whether it influences marketing participation choices or not. Households were asked if they were aware of market grades and standards, and whether there were problems meeting such standards. The households with knowledge on grades and standards, and had no problems meeting them were set to have expertise on grades and standards. Such households took the value of one and those households with no expertise on grades and standards were equated to zero. Households with expertise on grades and standards are expected to make use of formal markets than those without, thus an expected positive relation.

Collective action is measured by two main variables in this study; organizational support services (ORGMEM), and group or individual participation (PART). Respondents were asked whether they belonged to an organization or not and whether they sold output in groups or individually, the responses were allocated dummy values. Both variables are anticipated to impact positively on market participation choice among the smallholder farmers.

The types of farming (FMNGTYP) have been divided into either arable or livestock farming, where the former takes a value of one and the latter takes the value of zero. This variable was included into the model in order to capture the differences in the nature of produce from different farming types. Thus, in some types of farming, formal market penetration may be easier than in the other types. For instance, Matungul et al. (2002) pointed out that formal livestock markets are readily accessible to both commercial and small-scale livestock farmers in South Africa, owing to public investment in sales yards. The variable can take either a positive or a negative value.

Ownership of market transport (TRANS), specifically vehicles,

was used to measure the availability of produce transportation facilities by households. Moreover, the availability of transportation facilities helps reduce long market distance constraint, offering greater depth in marketing choices. In cases where households owned a vehicle, the variable took the value of one, and zero if the household did not own any form of vehicle. This variable is expected to have a positive influence on the market participation choices.

The availability of good road and market infrastructures are expected to exert a positive influence on market participation. Road infrastructure (RDINFR) is measured by the adequacy of the road networks that are accessible to households and their conditions. Market infrastructure (MKTINFR) is measured by the availability of infrastructure, such as marketing stalls and their conditions. Dummy values are used to define the variables, where in both cases, one indicates good condition and zero indicates either unavailability or poor condition.

In this study, social capital (SOCIALK) refers to personal social networks that encourage market participation. It is through these networks that trust is developed, which, in turn, encourages cooperation and regular exchanges. Also, information and production resources can be transmitted through these networks. In order to capture this variable, respondents were asked about how they relate with their customers and whether any were regular customers. The availability of an extensive social capital structure is expected to impact positively on the dependent variable.

The availability of contractual agreements (CONTRCT) ensures the availability of a guaranteed market for the farmers, thus promoting market participation and including the smallholder farmers in mainstream agriculture. In other words, the existence of a guaranteed market reduces the costs that are associated with searching for potential buyers, thereby encouraging participation in formal markets. This variable is expected to have a positive relationship with the dependent variable

The ability to add value to agricultural produce is captured by the variable (ADDVAL). Dummy values are used to define the variable where those households who add value to their produce, take the value of one and those who do not, zero. It is hypothesized that the ability to add value exerts a positive impact on market participation.

The variable storage facilities (STOR), is closely related to value adding. Good storage facilities reduce loss of produce and urgency of produce selling, and maintain the physical state of produce. Thus, households with good storage facilities are more likely to participate in formal markets, hence a positive relationship.

Traditions and beliefs are part of informal institutions that can influence marketing choices. In the model, the dummy variable (TRAD) which refers to guidance from tradition and beliefs is used to determine effects of tradition and beliefs on marketing. Households were asked on the extent to which tradition plays a role in their agricultural activities. They were also asked if they were open to new farming and marketing methods offered by non-family members. The variable was allocated dummy values where households with strong traditional guidance took the value of one and zero if otherwise. The variable is expected to take a negative value.

## EMPIRICAL RESULTS

### Descriptive results

The descriptive results for the demographic characteristics show that from all the interviewed respondents, there were a larger proportion of male respondents (58%) as opposed to females. However, there were greater proportions of females (63%) in vegetable farming, but in cattle, there were greater proportions of males. A large number of females in vegetable farming can be explained by day-to-day vegetable supervision by females where men move to cities/town in search of jobs. The majority (72%) of the smallholder farmers in the Kat River Valley are above 49 years of age. The educational level among the sampled farmers is generally low, where 18% of the household heads never attended school and 39% went up to primary level. Household size ranges from a minimum of two people to a maximum of 18, with a mean of 7.1 in each household. According to Randela (2005), a larger household size has a negative effect in produce marketing because the household needs to supply household consumption before it decides to sell. Evidence from the research confirms this line of argument because larger households in this research sold less produce as compared to smaller households.

Household incomes of the respondents are received from five main sources; farming, wages, pensions, social grants, and other small household business activities. Of importance, is the fact that in the absence of pension and social grants, 74 % of the households view farming as their main source of income. When selling produce, households had different reasons for choosing the marketing channels they use. A summary of the main market outlets used by smallholder farmers are presented in Table 2.

As shown in Table 2, more vegetable and cattle farmers make use of informal markets than formal markets. In an effort to find the reasons why the sampled farmers preferred the markets they use, they were interviewed on the prevailing marketing problems they faced during selling and those that constrained them from manoeuvring into more rewarding marketing arrangements. The most frequently mentioned marketing challenges are shown in Table 3.

Farmers were asked to clarify on the challenges that are listed on Table 3. For example, farmers were asked what they meant by market information. The most mentioned answers were related to information on prevailing prices, type of goods required in the markets and alternative markets. Farmers explained that the information which they had access to was unreliable because they usually got them from either other people in the village who are involved in selling or from the rural traders. They pointed out that they rarely trusted such information but, they had no option because those are the only sources accessible to them. Alternatively, the farmers explained that they would just take chances and go to the market place without any information and charge the same price as other people selling at that selling point.

Taking a closer look at the marketing challenges that were cited by households, they can all be resolved through technological and institutional innovations. For instance, low prices for produce can be related to poor produce quality, inability to reach other markets, being uninformed on what is required in the markets and abundance of the same produce in the markets. Poor

**Table 2.** Main market outlets used by sampled households.

| Type of farming | Main market outlets (%) | Market type |
|---|---|---|
| Vegetables (n = 43) | Farm gate (46.5) | Informal |
| | Fort Beaufort (32.5) | Formal & Informal |
| | Around the village (14.0) | Informal |
| | Roadside (7.0) | Informal |
| Cattle (n = 43) | Private sales (39) | Informal |
| | Speculators (26) | Informal |
| | Auctions (23) | Formal |
| | Abattoirs (9) | Formal |
| | Butcheries (3) | Formal |

**Table 3.** Marketing challenges among sampled households.

| Marketing challenges | Households affected (%) |
|---|---|
| 1. Lack of capital | 80 |
| 2. Bad roads | 79 |
| 3. Low prices for produce | 67 |
| 4. No reliable markets | 65 |
| 5. No market information | 64 |
| 6. Lack transport /high transportation costs | 59 |
| 7. No exposure to other markets | 53 |
| 8. Lack of storage facilities | 51 |
| 9. High competition | 46 |
| 10. No convenient place to sell from | 38 |
| 11. No transparency in marketing channels | 18 |

produce quality can be resolved by availability of information on grades and standards and an improvement in technology for storage and transportation. Farmers may be able to reach other markets if they participate in groups because they share information and broaden social capital within the groups. In addition, when farmers market in groups, they eliminate competition and may diversify into producing other crops, thereby reducing market pressure.

## Multinomial logistic regression results

The results for the model are presented in Table 4. The table shows the estimated coefficients ( values), standard error, significance values and odds ratios of variables in the model. According to Gujarati (1992), the coefficient values measures the expected change in the logit for a unit change in the corresponding independent variable, other independent variables being equal. The sign of the coefficient shows the direction of influence of the variable on the logit. It follows that a positive value indicates an increase in the likelihood that a household will change to the alternative option from the baseline group (Gujarati, 1992; Pundo and Fraser, 2006). Therefore, in this study, a positive value implies an increase in the likelihood of changing from not participating in marketing to either informal or formal market participation choice.

As indicated in Table 4, some predictor variables influence market participation choices significantly. Of the 14 independent variables used in the model, five and six variables in informal and formal market choices respectively, are statistically significant at the 5% significance level. In some cases, the signs of the estimated coefficients are consistent with the *a priori* expectations whereas in some they are contrary to expectations.

## Estimation of significant variables in the model

Access to market information has a positive sign for both formal and informal market choices, which is consistent with the *a priori* expectations. The significance values of 0.011 for the informal market choice and 0.006 for the formal market choice imply that there is enough evidence to support that an increase in the availability of market information results in an increase in both informal and formal market participation. The larger values in odds ratios show that households are most likely to increase

**Table 4.** Multinomial logistic results for informal and formal market choices as compared to non-marketing choice.

| | Informal market choice | | | | Formal market choice | | | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std. Error** | **Significance** | **Odds ratio** | **Coefficient** | **Std. Error** | **Significance** | **Odds ratio** |
| MKTINFO | 2.686 | 1.050 | 0.011* | 14.673 | 4.217 | 1.385 | 0.006* | 67.83 |
| GRADES | -1.623 | 0.905 | 0.073 | 0.197 | 3.830 | 0.848 | 0.016* | 46.06 |
| EXT | 0.606 | 0.868 | 0.485 | 1.833 | 1.166 | 2.942 | 0.282 | 3.209 |
| ORGMEM | 0.788 | 0.786 | 0.316 | 2.199 | 1.324 | 1.384 | 0.330 | 3.758 |
| FMNGTYP | -0.248 | 0.754 | 0.742 | 0.780 | -1.164 | 1.854 | 0.530 | 0.312 |
| RDINFR | 0.862 | 0.841 | 0.305 | 2.368 | 2.992 | 2.171 | 0.168 | 19.92 |
| SOCIAILK | 0.222 | 0.948 | 0.050* | 1.248 | 1.180 | 2.863 | 0.031* | 3.254 |
| ADDVAL | 1.352 | 1.079 | 0.210 | 3.865 | 0.392 | 0.218 | 0.860 | 1.479 |
| MKTINFR | 2.557 | 1.030 | 0.013* | 12.897 | -0.687 | 0.026 | 0.735 | 0.503 |
| STOR | 0.584 | 0.777 | 0.453 | 1.793 | 0.259 | 1.873 | 0.890 | 1.296 |
| CONTRCT | 0.844 | 0.755 | 0.263 | 2.326 | 2.803 | 1.912 | 0.047* | 16.49 |
| TRANS | 0.843 | 0.774 | 0.276 | 2.323 | 0.449 | 1.644 | 0.785 | 1.567 |
| PART | 1.899 | 0.854 | 0.026* | 6.679 | 1.997 | 1.418 | 0.039* | 7.367 |
| TRAD | 2.477 | 1.441 | 0.031* | 11.905 | -2.144 | 2.296 | 0.007* | 0.117 |
| INTERCEPT | -4.934 | 2.860 | 0.048 | _ | -17.069 | 4.466 | 0.044 | _ |

**Goodness-of-fit**

| | **Chi-Square** | **df** | **Significance** |
|---|---|---|---|
| Pearson | 111.372 | 168 | 0.050* |
| Deviance | 84.301 | 168 | 0.988 |

N = 86; * Statistically significant at 5% significance level.

participation in both informal and formal markets with the availability of market information. As shown by the coefficients, the increase in formal marketing, resulting from market information availability is about twice the increase in informal marketing.

Expertise on grades and standards is significant for the formal market choice with a significance value of 0.016. A positive sign on its coefficient indicates that an improvement in expertise on grades and standards results in an increase in the formal market participation choice by households. When households acquire expertise in grades and standards, they prefer selling their produce in the more paying formal markets, in order to cover costs associated with acquiring the expertise (Reardon and Barrett, 2000).

A positive and significant (0.047) relationship was found between formal market participation and the availability of contractual agreements. The relationship implies that households tend to increase in formal market participation with the availability of contractual agreements. The value of the odds ratio (16.49) supports the higher probability of the variable influence on the formal market choice.

The variable existence of extensive social capital is significant for both informal (0.050) and formal (0.031) market choices. The positive relationship in both formal and informal market participation choices explains that an increase in social capital results in households shifting from non-participation to formal and informal market participation. The odds ratios for both formal and informal market choices suggest a higher probability of shifting to formal and informal marketing with an increase in social capital. Therefore, it can be concluded that social networks are important in produce marketing, regardless of the choice of market being used.

It was expected that the availability of good market infrastructure could have a positive influence on alternative market participation choices, away from not participating in marketing. However, the *a priori* expectations hold true for the informal market choice only. There is sufficient evidence (significance value of 0.013) to support that the availability of good market infrastructure is likely to encourage households to market their produce through informal channels. Unlike formal channels where market infrastructure is not important for farmers, as they supply their produce in bulk once harvested to the higher level of the marketing channel (Takavarasha and Jayne, 2004).

The results shown in Table 4, for group participation are consistent with the *a priori* expectations. For both formal and informal market choices, there is enough evidence to support that when households market their produce in groups, there is a higher chance of participating in either formal or informal markets. Thus, group participation encourages market penetration among smallholder farmers who find it difficult individually to gain

market access

A positive and significant (0.031) relationship was found between informal marketing and guidance from traditions and beliefs. The positive relationship between the variables may be possibly explained by traditional wisdom and skills passed on in families and creation of marketing links through traditions and beliefs. For instance, some households may prefer to sell their produce (especially in cattle marketing) to people they are familiar with. On the other hand there is a negative and significant (0.007) relationship between formal marketing and guidance from traditions and beliefs. The explanation to this relationship may be that the marketing environment is ever changing (Kherallah and Kirsten, 2001); therefore, if farmers are to be part of the formal markets, they have to be receptive to changes.

## CONCLUSIONS AND RECOMMENDATIONS

This paper has attempted to identify factors influencing market participation choices among smallholder farmers in the Kat River Valley. Evidence from the research supports literature that pointed out that, smallholder farmers usually use informal markets in selling their produce. Furthermore, there are some challenges in the market environment that discourage these farmers from using formal markets. The statistically significant variables, at 5% level are access to market information, expertise on grades and standards, availability of contractual agreements, existence of extensive social capital, availability of good market infrastructure, group participation and reliance on tradition.

The results of this study suggest several ways in which smallholder farmers can actively market their produce. The findings suggest that an adjustment in each one of the significant variables can significantly influence the probability of market participation. That is, technological growth and institutional developments that affect such variables can help farmers improve participation and encourage formal market participation. Firstly, it has to be accepted that smallholder farmers cannot individually compete against commercial farmers in markets. Also, it is difficult for them to get contractual agreements individually, owing to a small marketable output. Therefore, beneficial institutional innovations can be in the form of co-operatives and group marketing arrangements. It is true that past experiences for co-operatives and other farmer group arrangements had their own challenges (Kherallah and Kirsten, 2001). However, it is worth noting that farmer group arrangements that are based on trust and commitment may be successful. This brings out the suggestion that when choosing group members, farmers working towards the same goal should be grouped together. In addition, rules and roles within the group ought to be specified from the beginning. Also, farmers have to be encouraged to develop trust and mutual respect for their fellow members.

With the farmer groups, social capital is likely to be broadened and farmers can now be linked to other market chain actors. For instance, smallholder farmers in a co-operative or farmers marketing in a group can be considered for contract production. Once they get contractual agreements, an entrepreneurial culture can be developed, where they produce for marketing, rather than trying to market what they have produced. Again, it is critical to develop trust between the farmers and the contractors, even though it should be supported by legal compliance. Farmers can gain trust by delivering the required produce and contractors can develop trust by having confidence in the producers. Such an environment encourages marketing and is advantageous to both parties (Masuku et al., 2003).

The government can support the smallholder farmers through technical innovations. These may be in the form of investments in public facilities such as improved roads, telecommunications and market places. Smallholder farmers still have to play a role in order to ensure that these facilities are provided for them. They have to form an association and choose a lobby that has to represent them.

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