

CHAPTER FOUR

HOUSEHOLD CHARACTERISTICS AND PATTERNS OF MARKET PARTICIPATION

4.1 INTRODUCTION

In the previous chapters it has been shown that smallholder farmers fail to access agricultural markets due to transaction costs. These transaction costs emanate from differential access to assets and information, and tend to be household specific. Some empirical studies have found that specific household characteristics contribute to the existence of transaction costs. The empirical model for this study requires information about market access and participation, as well as sources of transaction costs that might be resulting from household characteristics.

This chapter provides an overview of the characteristics of the sample households in order to assess the variables for the specification of the model. The means are computed across all households since the model to be estimated incorporates all the observations. Prior to this the socio-economic characteristics are discussed. Then, the commercial orientation of the households is presented giving a breakdown of the households' farming activities. The last section discusses the characteristics of participants related to different enterprises. In this case the means are computed per participating group. Some of the salient statistics are provided in Appendix one.

4.2 SOCIO-ECONOMIC CHARACTERISTICS OF SAMPLE HOUSEHOLDS

The conditions of livelihood in the rural areas are to a considerable extent reflected in the socio-economic factors of households, which in turn influence the households' economic behaviour. This section discusses the socio-economic characteristics of the sample households in the study area. The section is divided into three subsections. The first subsection provides the structure of the households. The

asset structure is presented in the second subsection, while the third subsection discusses factors of physical location and information access.

4.2.1 Household structure

The structure of the households is presented in terms of family size and participation of members in various activities. Table 4.1 shows the size and structure of the household.

4.2.1.1 Household size

In the study area, the typical sample household consists of about seven members, which is common to many rural households. Of the seven members, about five are children and the other two adults. In a number of instances the household has only husband and wife (or no husband), while in other cases some households consist of extended families (grandparents, in-laws, and other relatives). In a typical sample household the ratio of male to female members is more or less the same, with the number of female members being slightly higher.

Table 4.1: Household size and structure

Variable	N	Mean (Std Dev)*	Minimum	Maximum
Total male members (MALEMEMB)	155	3.50 (1.83)	0	10
Total female members (FMALEM)	154	3.82 (1.99)	1	12
Number of children (CHILDREN)	150	5.34 (2.90)	0	20
Total family members (TFAMILYM)	154	7.28 (3.10)	2	22

* Values in braces are standard deviations (Std Dev)

For the specification of the model, the household size needs to be adjusted to the adult equivalent (AE) based on the ages of the participating household members. The purpose of the adjustment is to adjust the discrepancy of combining dependents (or predominantly consumers) and potential labour (or predominantly producers). To make the adjustment to potential labour the schedule as suggested by Chayanov

(1986) is adopted. Thus male members older than 26 years old counted as 1 unit and female members counted 0.8 units. Those household members in the age group between 21 and 26 counted as follows: 0.9 for male and 0.7 units for female members. Male and female household members between 15 and 20 years old are counted as 0.7 and 0.6 units for male and female members, respectively. Those members whose ages fall in the 8 to 14 years age group count as 0.5 units.

Table 4.2 indicates that a typical sample household has about five AE members. 25% of the households have fewer than 3.5 AE members, while about 25% of the households have more than 6 AE members. Based on similar weightings for household members, who indicated that they are involved in farming, it is found that a typical sample household has about 2.58 AE members, 25% of the households have fewer than 1.80 AE members, but also 25% of the households have more than 3.5 AE members involved in farming. These statistics show that not all household members are involved in agriculture. In actual fact, most of household members are involved in other activities, or may just be consumers.

Table 4.2: Household size in Adult Equivalent

Source		Mean*
Number of members	156	4.91 (1.97)
Number of members in agriculture	155	2.58 (1.58)
Share of members in agriculture (%)	155	56.61 (30.71)

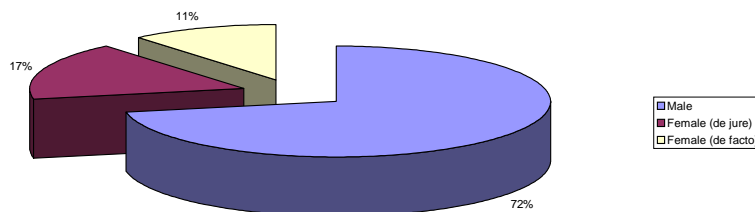
* Values in braces are the standard deviations

4.2.1.2 Gender, age and education of the head of the household

Normally the head of the household is responsible for the co-ordination of the household activities. As such it is pertinent to include some attributes such as gender, age and education of the head in the specification of market participation decisions. Of the 156 households who responded, 72% of the households are headed by men (Fig 4.1). In the rural areas of South Africa, and particularly in the Northern Province, the male heads of the household (the husbands) tend to migrate

to the urban centres to seek work. In their absence wives are left to take many decisions about household matters as *de facto* (functional) head. In 11% of the households this is the case. In addition, 17 % of the households in the sample are headed by a *de jure* (legal) female head. In total, about 28% of the households in the sample are effectively headed by women.

Fig 4.1: Gender of household head



The age of the head of the household is considered a crucial factor, since it determines whether the household benefits from the experience of an older person, or has to base its decisions on the risk-taking attitude of a younger farmer. Typically, heads of households are about 57 years of age (Table 4.3). The distribution of this variable is normal with the mean virtually at the centre of the range. The youngest head is 31 years old, while the eldest is 82 years of age. Another attribute of importance pertains to the level of education attained by the heads of the households, who, normally, are the decision-makers. Typically, heads of the households would normally have attained about grade six of formal education. This level affords the person with ability to do basic communications for business purpose. However, there are some households who have achieved tertiary level of education. Those are more able to interpret information better than those who have less or no education.

Table 4.3: Age and education of the head of the household

Variable	N	Mean	Std Dev*	Maximum
Age of head of the household	150	57.57	11.55	82
Age of second household member	141	46.26	12.21	73
Education of head of the household	132	6.24	3.99	15
Education of second household member	129	7.13	3.85	15

* Standard Deviations

4.2.2 Household endowment (assets)

The previous sub-sections focused on the human resource endowment of the rural households in the study area. The next section addresses the physical endowment. There are three types: fixed assets (land), mobile assets and financial assets including non-farm income.

4.2.2.1 Land

Insufficient land constitutes one of the most constraining resources facing rural households in South Africa. Typical sample households try to gain access to both residential and production sites. In the study the area of land accessible to rural households includes residential land, arable land and grazing land. Table 4.4 shows that, in reality, households have access to very small pieces of land. In fact, the problem of access to land was found to be common all farmers. Normally, the rather limited residential site is supposed to accommodate houses (40%), a kraal (15%) and backyard cropping activities (45%). The minimum area found in the study is about 0.2 ha, and the maximum of 1.20 ha.

Table 4.4: Size and access to land

Type of land	N	Mean	Std Dev*	% Owning	Maximum
Residential area (ha)	76	.26	0.18	100	1.20
Arable land area (ha)	151	3.11	3.68	99	27.50

* Standard Deviations

Though almost all households in the sample have access to land for crop production, the major problem is the size of the plot. A typical sample household has access to about 3.11 ha of arable land, with the largest plot being 27.50 ha and the smallest

about 0.5 ha. Those households with a very small area of arable land are generally dependent on the communal grazing land for agricultural purposes. It is found, however, that it is hardly plausible to measure the size of communal grazing area accessible for individual households. In actual fact, the number of livestock, discussed below reflects the level of access to grazing land.

4.2.2.2 Mobile assets

Table 4.5 shows ownership of mobile assets. For many households livestock is a source of social status. Hence, the majority of households own livestock, such as cattle, goats and sheep. Only about 38% of households do not have livestock.

Table 4.5: Ownership and highest value of mobile assets+

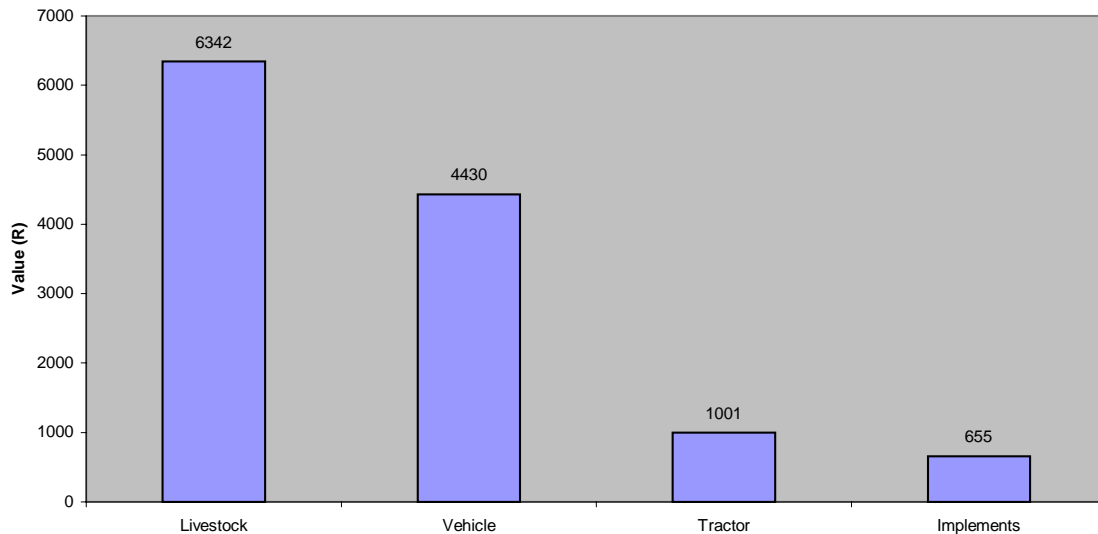
Variable	N	% Owning
Livestock ownership (R)	157	62
Implements ownership (R)	154	100
Tractor ownership (R)	150	6
Vehicle ownership (R)	150	15

Other mobile assets include vehicles, tractors and agricultural implements. Generally, very few households own such assets. As shown in Table 4.5 only 6% and 15% of the households own tractors and vehicles, respectively. These households tend to provide mechanisation services to other farmers. In addition to having a higher status in the community, these households also tend to have good connections with individuals and institutions outside their immediate communities.

The relative values of the mobile assets are shown in Fig 4.2. Livestock is the most important mobile asset for rural households. The reason for this might be that livestock might be obtained easily since it is bred locally. Moreover, the units are more divisible. Hence for the purpose of the model specification, the value of livestock is included as one measure of assets endowment and social status. The ownership of a tractor and/or vehicle is an exclusive asset in rural communities. These assets are normally owned by a small number of well-to-do households. For

this reason the ownership of a tractor and/or a vehicle are combined to increase the number of observations for the model.

Fig 4.2: Mean values of household mobile assets



4.2.2.3 Financial assets

As households integrate with the monetary economy, they tend to depend more on financial assets. Thus, households use financial services to provide for such liquid assets. About 58% of the households who responded have savings accounts (Table 4.6). Other financial assets are insurance policies. Only 24% of the responding households have insurance policies. Since these variables have many missing values, they are not included in the specification of the model.

Table 4.6: Financial assets

Asset	N	Mean Proportion
Have savings account (%)	121	58
Have insurance (%)	128	24

4.2.2.4 Non-farm income

Almost all the households in the study area depend on a combination of agricultural and non-agricultural activities for their livelihood. This section aims to discuss the non-farm income generating activities of the rural households in the study area. In general households invest non-farm income in farming activities such as buying inputs and paying for outside labour. Non-farm income is also used to finance marketing activities. As such, access to non-farm income has a bearing on market participation.

Table 4.7 provides a summary of the various sources of income of the surveyed rural households of the Northern Province. These sources include business, pensions, services provision, salaries and wages. Generally, very few households get their incomes from business activities. On average a typical sample household gets about R1524 per annum from business (agribusiness, retail, and hawking) and about R2120 from services. About 31 households receive income from providing services. These services include activities provided by household members based on their skills, e.g. income from jobs such as electricians, bricklayers etc. Another major source of income is wages and salaries. 75 households in the sample depend on these.

Another source of income is pensions. About 50% of the surveyed households have at least one member of the household receiving an old age pension. These are normally paid out to female senior citizens aged 60 and over and to male senior citizens of 65 years and over. After 1994 all the payments were R420 per month (or R5160 per annum). This entails that the interpretation of the mean earnings from pensions is not appealing as compared to the mode, which would imply that most of households have one member receiving pensions.

Table 4.7: Non-farm and total income of surveyed households (R)

Source of income	N	% Receiving income	Mean	Standard Deviation
Agribusiness	157	9	575	3616
Retail	157	5	621	3892
Hawker	157	9	328	1999
<i>TOTAL BUSINESS</i>	<i>157</i>	<i>20</i>	<i>1524</i>	<i>5733</i>
Services	157	20	2120	7029
Pension	157	50	3600	4037
Salaries	157	16	5589	15707
Wages	157	35	3319	6281
<i>Subtotal of salary and wages</i>	<i>157</i>	<i>47</i>	<i>8975</i>	<i>17033</i>
Agricultural sales	157	50	2907	7738
Value of exchange	156	48	3816	7965
Value of own consumption	156	67	4547	8011
TOTAL	157	100	21365	20434

Non-farm income influences transaction costs by facilitating access to information and supporting the transportation of products to the market in cases when there is no capital budgeted from the farm income. Furthermore, non-farm income can serve as a security against the risk of market failure. As indicated in the literature, market uncertainties do contribute to transaction costs. For the model, non-farm income is specified into two variables: one indicating pensions earnings and another indicating the aggregation of other non-farm activities. The aggregation of non-farm income is motivated by the few cases of individual income sources. Generally speaking, earners of pensions tend to behave differently from earners of other incomes. A reason might be that pension-earning farmers (likely to be decision makers) are elderly and it follows that their response to market incentives might be different.

4.2.3 Location and access to information

Transaction costs also emanate from factors relating to location and access to information. For example, those households located closer to market centres will experience lower transaction costs since they can get information more easily. At the same time, better access to information will reduce the transaction costs.

4.2.3.1 Access to business centres

Usually farmers do most transactions at centres mainly located in service centres, nodal points, business centres or major towns. Good access to such centres might imply low transaction costs.

Pietersburg, which is the main city of the Northern Province, is a major potential market centre where a variety of markets are available. For example, there are a fresh produce market, co-operatives, milling companies, and a variety of butcheries and supermarkets. So, the distance to this centre has a bearing on farmers' access to markets. The typical sample household in the survey is located about 104 km away from Pietersburg (Table 4.8). The closest household is located about 25 km from the city. These include the households in Maja and Mothiba areas.

There are other towns in the various regions to which households are closer. In the Northern region, the nearest town is Thohoyandou, Giyani is the most important centre in the Lowveld, Lebowakgomo in the Southern region, Mankweng or Pietersburg in the central region, and Potgietersrus or Ellisras in the Western region. Although these centres are not as big as Pietersburg, they are regional alternatives. They have co-operatives, roller mills and supermarkets, albeit on a relatively smaller scale compared to Pietersburg. Nonetheless, due to their proximity and their potential for service delivery, farmers tend to make use of the nearest towns for meeting their farming needs. Normally farmers know more about farming institutions in the nearest towns than they do about Pietersburg. Typical sample households are located about 27 km away from the regional centres. The furthest household is located about 60 km away. Unlike the variable indicating proximity to Pietersburg that is collineated, the proximity to the nearest town will be included in the specification of the model in kilometres.

Table 4.8: Access to business and service centres

Variable	N	Mean	Maximum
Distance to Pietersburg (km)	158	104	287
Distance to nearest town (km)	158	27	60
Road conditions to nearest town			
• Tarred (%)	158	32	
• Maintained gravel (%)	158	26	
• Gravel (%)	158	42	
Distance to hospital (km)	158	25	55
Distance to co-operative (km)	48	25	60
Distance to extension office (km)	158	3.27	25
Distance to agricultural office (km)	158	23	61

The conditions of the road are important in accessing these centres. About 26% of the households use maintained gravel roads to reach the nearest town, while 32% access the nearest town by tarred road. Thus, about 58% of the households use readily accessible roads to the nearest towns. 42% of the households have to rely on gravel roads in poor condition to reach the nearest town. For the specification of the model this variable is recoded into a single dummy variable, by regarding tarred and maintained gravel as roads in good condition.

Hospitals and co-operatives are other forms of market outlets for agricultural produce. Sometimes farmers need to visit hospitals because they might get tenders to supply produce to hospitals. Hence, their proximity to such centres is crucial. The typical sample household in the survey is located 25 km away from the hospital. The average distance to a co-operative is about 25 km, while the furthest distance is about 60 km. The variable of proximity to the hospital and the one to the co-operative are not included in the model due to collinearity problems and missing observations respectively.

The distance to the local extension office is an important factor since the interaction of the farmers with the extension office is crucial in making information available. The mean distance to the extension office is 3.27 km. The number of contacts farmers have with extension officers is about three (to be precise 3.26) times per month. Because farmers can obtain printed material on potential markets at the

district agricultural office, the distance to the office affects the cost of searching for information. On average households are located 23 km away from district agricultural offices.

4.2.3.2 Ability to communicate

Ability to read and interpret market information reduces the cost of the search for information. Most of the market information is written in English or Afrikaans. Only 41% of the heads of households can read English and/or Afrikaans. It follows that it is costly for the majority of households to gain access to written market information. Only 17% of the heads of households are able to read in more than two African languages. This variable, however, may not be crucial since little or no market information is available in the African languages. Information like this does, however, reflect the language barriers that exist among and within different ethnic groups.

Table 4.9: Ability to manage information

Factor	N	Mean
Member of a group (%)	128	55
Ability to speak at least two African languages (%)	155	32
Ability to speak English or Afrikaans (%)	155	43
Farmers keeping records (%)	141	53
Average education (years)	152	7.49
Farming learnt through extension contact (%)		71
Ability to write in English or Afrikaans (%)	155	39

For negotiation to take place and be successful a basic command of languages is needed. Most of the formalised markets will require communication in either English or Afrikaans. About 43% of the farmers can negotiate in English or Afrikaans. In contrast, some of the non-formalised markets require communication in the local (African) languages. In the study area only 32% of the farmers can negotiate in two or more African languages. This, however, applies more to direct sales, which in the rule happens within the local boundaries. Being able to negotiate in English and/or

Afrikaans will encourage exchange for finished products since most of the institutions dealing with these products are managed in Afrikaans or English.

The average education for a typical sample household is 7.49 years of formal schooling, which is equivalent to grade eight or form one (std 6). The least educated household has two years of formal education. In addition, nearly 40% of the heads of households can write English or Afrikaans.

The above information has provided a general picture about the socio-economic factors of the surveyed households. In sum, typically, the sample households have about five AE members. Most of the household heads are male, with a normal spread of age. Households have, generally, limited access to assets such as arable land, livestock, vehicles and tractors, as well as non-farm income. Farmers' location to the nearest towns provides them ample opportunity to interact with agricultural institutions. The conditions of the road to such towns also ensure accessibility of markets. It is found that most households make use of well-maintained roads, while some make use of non-maintained roads. For information's sake: on average typical sample households have completed their primary level of education, which enables them to conduct basic communication and interpret market information.

The factors mentioned above have a bearing on the existence of transaction costs and market access, and consequently participation in the market.

4.3 ACCESS TO AGRICULTURAL MARKETS – A DESCRIPTIVE OVERVIEW

This section provides a descriptive profile of market participation in the survey areas. The households' participation in agricultural markets is evaluated by, firstly, looking at patterns of access to agricultural cash markets, and, secondly, presenting other residual options of agricultural exchange and subsistence farming.

4.3.1 Patterns of market participation

To generate income, households sell all or some of their produce for cash. In many instances the activities generating such sales are as diverse as the product itself. In the households sampled, agricultural incomes are generated through the sales of both high value and food commodities. The high value crops include horticulture (fruit and vegetables) and livestock (large stock, small stock and poultry). The food crops include maize and other field crops. According to Table 4.10, 19% of the households sell horticultural crops (fruit and vegetables).

Table 4.10: Mean annual income from agricultural sales (R)

Source of Sales	N	Mean (R)	% Selling
Horticulture	?	1663	19
Livestock		492	17
Maize		293	21
Other field crops		459	22
Total agricultural income		2907	50

The mean sales are calculated for the entire sample since the empirical model to be estimated includes all the surveyed households. These means are given in the same table. Seventeen percent of the households sell livestock and about 20% of the households sell maize. Furthermore, about 22% of the households sell other field crops (wheat, groundnuts, beans, melon, and sunflower). It follows that almost 50% of the households sell their agricultural produce on the cash market.

The pattern of market access can be illustrated in two ways, that is, by the interaction among commodities, and through selling by regions.

4.3.1.1 Interaction among commodity markets

In accessing markets farmers do not necessarily focus on selling a single commodity. Some farmers are involved in selling more than one commodity. In that case, the farmers' involvement in one market may be affected by the involvement in another (Appendix 1.2). For example, three farming households sell horticultural

commodities and livestock. The conclusion can be drawn that these households are very commercially inclined as they are involved in high value commodities. Twelve farmers sell both horticultural and other field crops, while thirteen of horticultural crop sellers also sell maize. These are farmers who use both dryland and irrigation practices for commercial production. Six and eight farmers sell livestock, other field crops and maize. Finally, 13 of the farmers sell both maize and other field crops.

From the preceding paragraph it appears that livestock sellers are the least involved in selling other commodities. This implies that the marketing requirements of livestock and crops are different. One explanation is that due to constraints in market access, smallholder farmers might focus their resources on selling either livestock or crops. Another explanation is that farmers generally seem to choose one of the high value commodities, which include livestock and horticulture, and thus only a few farmers are involved in selling the particular types of commodities.

There is no strong interaction among major commodities. The models specified will therefore be based on individual commodities in the assumption that the behaviour of farmers in market participation focussing on a particular commodity will not be affected by the selling of another commodity.

4.3.1.2 Participation by region

The second pattern of agricultural sales has a regional or district dimension. Table 4.11 indicates the proportion of households participating in various markets by region. The Northern Region appears to have the largest proportion (83% of 24 households) of households participating in markets. The farmers in this region have the highest proportion of the 24 households selling maize and horticulture crops, that is 63% and 50%, respectively. This might be attributed to the fact that most of the farmers are relatively close to Thohoyandou, the nearest town, and most of them are reasonably well endowed with assets. For example, it is found that a number of farmers is also involved in other business activities, or earn salaries. One respondent in the region owns a taxi fleet, vehicles, and a car repair workshop. Given his business orientation this farmer is likely to participate in the agricultural markets.

In the Southern Region, 67% of the households surveyed sell some or all of the crops to markets. About 48% of the households sell other field crops, in most cases wheat and coriander produced in the Mathabatha irrigation project. About 19% of the households sell horticulture and maize crops. The market accessibility in the region could be attributed to the project being situated in Mathabatha, where farmers are supported with a focused extension service that facilitates farmers committees. Members of such committees are usually well informed about farming activities in the project. During the survey, one secretary could produce all the records of the sales and income of the various enterprises. This group of farmers is also involved in searching and negotiating markets for the project. Wheat is produced and sold by farmers as a co-operative activity. As a side effect it is found that nearby farmers who are not part of the project also benefit from the arrangements in selling maize and horticulture produce.

Table 4.11: Percentage households selling cash & food commodities by region

Region	Horticulture	Livestock	Maize	Other field crops	% Selling by region
Northern (N=24)	50	17	63	33	83
Lowveld (N=18)	39	22	17	0	56
Central (N=58)	0	23	9	9	31
Southern (N=27)	19	15	19	48	67
Western (N=30)	17	7	13	23	43
% Selling by commodity	19	17	20	21	50

NB: Entries are by cell (not across column nor row)

In the Lowveld region about 56% of the households sell agricultural products to the market. The commodities with a strong commercial orientation are horticulture (39%) and livestock (22%). The level of horticulture commercialisation in the region is attributable to a banana project at Homo where each farmer owns at least 7,5 ha of banana plantation. During the survey, farmers were harvesting and used predominantly female labour. The farmer with a pick-up truck was ready to transport the fruit to the market to be stored. The banana farmers also grew vegetables on the same banana plots. Other farmers involved in vegetable production are located in the Hlaneki area, about 7 km from Giyani. One of the

female farmers owns a large plot together and a retail shop. At the time of interview this farmer was harvesting tomatoes and some vegetables, which were taken to Giyani, the nearest town. Other vegetables were sold to the local community at the retail store. The livestock sellers were found at Mninginisi, approximately 25 km from Giyani. These farmers take their livestock to the feeding program before they are auctioned. Sometimes they sell them to the operator of the feedlot at a discounted price. This illustrates that farmers are generally interested to participate in the market and many of them do participate when conditions allow.

The extent of market participation by the households surveyed in the Central and Western Regions is substantially less. In the Western Region only 43% of the households sells any of their crops or livestock. It is surprising to find such a small proportion of households selling livestock, given that the region is ideally suited for livestock production. This may be a reflection of poor market development or high transaction costs. The Central Region has the lowest proportion (31%) of households participating in agricultural markets. About 23% of the households in the area sell livestock, and just 9% sell maize and other field crops. The Central Region is also a livestock production region, but the area south of Pietersburg where the sample is taken is more of a maize production area. The high livestock market participation may be attributed to small stock and poultry production, while the lower maize market participation may be substituted by the arrangement of “exchange” discussed in the next section.

4.3.2 Value of exchange and subsistence production

In some instances farmers cannot access direct cash markets since they may have food security considerations. In these cases, households exchange agricultural products for processed products. This is an alternative institutional development in market access, where the value is added to the smallholder farmer's product without change in title. For example, farmers make an agreement with a co-operative, a milling company or a trading store to deliver their maize in exchange for maize meal. The costs incurred involve transport (about R10), milling cost (R22) and storage

costs (about R18). These costs are paid when farmers collect the maize meal. In the study area almost 50% of the households exchanged maize for the finished product.

Similar arrangements, particularly with local traders and consumers, applied to other products, so that the costs of exchange remain minimal. In terms of livestock, it is found that farmers would exchange one type for another type of livestock to be used for different purposes. Almost 25% of the households exchange livestock. According to table 4.12, about 49% of the households are involved in exchange arrangements.

Table 4.12: Households participation in markets (%)

Value categories	Household (%)
Sell for cash	50.3
Market exchange	48.7
Value of household consumption	
Not consume	30.6
R1 – R1000	42.0
R1001 and greater	27.4

The other alternative to cash sale is home consumption. The value of this process is derived from the quantity of consumed produce valued at the purchase price. Accordingly, the mean value of maize consumed is estimated at R384, that of other crops at R142 and livestock at R177. In total the mean value of household consumption is R705. The total value of consumption, agricultural sales as well as the exchanged goods is estimated at R4 547 on average. This is equivalent to 21% of the total household income of R21 365. The household consumption represents 15.5% of the agricultural income and 3% of the total household income.

4.4 PARTICIPATION IN DIFFERENT COMMODITY MARKETS

In the previous section, it is indicated that households sell mainly four types of commodities: horticulture, livestock, maize and other field crops. Five categories of households were consequently created for the dependant variable, namely those

selling horticultural crops, those selling livestock, maize, and other field crops. Finally, there are those households that do not sell anything (non-participants).

Following the classification of the respondents in different groups, bivariate means analyses are applied to compare the households participating and those not participating in each of the four commodity markets as identified for the purposes of this study. Households are compared with respect to their general inclination towards commercialisation, the indication of sales levels for commodities outside the particular market, and with respect to socio-economic and transaction cost characteristics.

4.4.1 The horticultural market

Households participating in the market for horticultural commodities are considered to be more commercially inclined due to the nature of the product. Horticulture crops are generally perishable and require immediate disposal. As such, farmers producing horticulture crops do so with intent to sell. In this study it is found that 19% of the sample households are selling all or a proportion of their fruits and vegetable harvest to a range of market outlets varying from informal markets to the large urban based fresh produce markets. Typically, many of the households producing fruits and vegetables also have access to a dryland plot where they commonly produce maize and/or other field crops.

This inclination towards commercialisation resulting from horticultural activities has also an effect on these households' commercialisation behaviour in the maize and field crop production, resulting in 45% and 41% of the households also selling maize and field crops, respectively. The relatively strong commercialisation behaviour of the households selling horticultural products is further illustrated by the comparison of means in Table 4.13.

Table 4.13: Comparing commercialisation behaviour between sellers and non-sellers of horticultural crops

Item	Non-participants N = 128	Participants N = 29	F-Statistic
Mean value of horticultural sales (R)	0	R9 005	45.47***
Selling maize (%)	15	45	14.11***
Selling livestock or products (%)	19	10	1.17
Selling other field crops (%)	16	41	9.29***
Mean value of maize sold	R213	R538	4.09**
Mean value of livestock sold	R448	R686	0.322
Mean value of other field crops sold	R359	R899	4.77**

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

When production and aspects of home consumption are considered, there seems to be very little difference between the two groups. Quantities of maize consumed and exchanged are almost the same with obviously no significant difference in the means. Only in the case of the home consumption of other field crops a significant difference is found with the participants consuming considerable more of their production. This could, however, also be an effect of higher yields (Table 4.14)

Table 4.14: Comparing production and home consumption between sellers and non-sellers of horticultural crops

Item	Non-participants N = 128	Participants N = 29	F-Statistic
Maize production (# of 80 kg bags)	12.80	17.69	2.18
Home consumption of maize (# of 80 kg bags)	3.05	3.21	0.02
Maize exchanged for maize meal (# of 80 kg bags)	7.13	7.07	0.00
Mean value of livestock consumed	R193	R104	0.58
Mean value of other field crops consumed	R106	R302	10.28***

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

The next component of the descriptive analysis explores the difference in means for those variables that are likely to explain the difference in commercialisation behaviour of households producing horticultural crops. One would, obviously, expect that those households forming part of an irrigation scheme, and those farming with cash crops such as bananas would be more likely to participate in the market than other households. This study assumes, however, that certain socio-economic, wealth and spatial characteristics might also play important roles in

people's decisions to sell or not to sell. Table 4.15 provides a summary of the results.

One would expect that participating households are better endowed and have more access to liquid assets like income from other non-farm income sources such as pensions and wages which might assist in leveraging market access. It seems, however, that no such trend is emerging from the analysis of means. A stronger endowment position relates significantly to access of arable land and the ownership of a tractor and/or vehicle. Endowment in terms of human capital (education, age, and extension), also, does not vary significantly among the groups.

It is found, though, that market participants seem to be located closer to the nearest market centres or towns than non-participants, and also has access to better roads. This proximity (and superior accessibility) to the markets might have assisted in providing better access to information and thus to market opportunities.

Table 4.15: Comparing explanatory variables for horticultural sellers and non-sellers

Item	Non-participants N = 128	Participants N = 29	F-Statistic
Mean value of livestock owned (in R100)	69.54	36.40	1.32
Mean value of pensions earned (R)	3 877	2 386	3.27
Mean of salaries and wages earned (R)	8 755	9 937	0.112
Mean value of business income (R)	1 470	1 759	0.06
Mean age of household head (years)	58	57	0.01
Household head is female (%)	30%	14%	2.86*
Mean household size (AE)	4.99	4.56	1.13
Average education of household (yrs)	7.42	7.81	0.72
Mean size of arable land	2.30 ha	6.49 ha	37.86***
Ownership of vehicle or tractor (%)	14	31	4.87**
Proximity to nearest town	-28 km	-23 km	3.82*
Road conditions to nearest town good %	25	62	16.34***
Farming learnt through extension visits %	70	76	0.39

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

4.4.2 The livestock market

Households participating in livestock markets are considered commercially oriented since livestock production is a high value enterprise. In this study it is found that

17% of the households sell all or some of their cattle, sheep, goat and poultry at auctions, to the local community, as well as directly to markets.

Most of livestock producers also have access to arable lands for crop production, particularly dryland crops. The commercial inclination of livestock farmers also influences their attitude towards maize and other field crops markets. Table 4.16 shows that about 30% and 22% of the livestock market participants also sell maize and other field crops, respectively. Although the linkage between livestock and field crops markets is not clear, these enterprises tend to complement each other. Field crops are grown on arable lands in summer while livestock is allowed to graze in the grazing area. In winter, livestock is let into the arable lands for supplementary grazing. Perhaps, the complementarities in production could explain the positive, though not significant difference in market participation for livestock owners and those who are not. The returns from commercial activities for livestock sellers and non-sellers are shown by mean values in Table 4.16.

Table 4.16: Mean comparison of commercialisation behaviour of sellers and non-sellers of livestock

Item	Non Participant N= 130	Participants N = 27	F-Stats
Mean value of livestock sold (R)	0	2861	61.18***
Selling maize (%)	19	30	1.72
Selling horticultural crops (%)	20	11	1.17
Selling other field crops (%)	21	22	0.03
Mean value of maize sold (R)	199	633	7.04***
Mean value of horticulture sold (R)	1995	68	1.54
Mean value of other field crops sold (R)	513	198	1.50

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

The livestock sellers do not receive a significantly better price for maize, although the value of the maize sold is significantly different from those who do not sell livestock. Other livelihood indicators are not significantly different for livestock sellers in comparison with non-sellers of livestock. The livestock sellers produce more maize, but consume less. They do consume more of other crops, however, in all probability field crops (Table 4.17).

Table 4.17: Comparing production and consumption of sellers and non-sellers of livestock

Item	Non Participants N = 130	Participants N = 27	F- Stats
Maize production (# of 80 kg bags)	13.08	16.70	1.12
Home consumption of maize (# of 80 kg bags)	3.12	2.85	0.05
Maize exchanged for maize meal (# of 80 kg bags)	7.35	6.00	0.35
Maize producer price (R / bag)	63.24	65.00	0.39
Maize purchase price (R / bag)	127	121	3.51
Value of livestock consumed (R)	94.82	571	17.55
Value of other crops consumed (R)	95	571	0.97

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

The next analysis explores the difference in means for variables that are seen as explaining the difference in market participation behaviour of livestock farmers. It is anticipated that livestock farmers showing commercial inclination would have a better socio-economic standing, implying that they might face lower transaction costs. Table 4.18 shows the summary of the results of the different factors explaining the difference in behaviour of those who sell livestock in comparison with those who do not. Generally, there is a very weak pattern emerging from this analysis.

Table 4.18: Comparing explanatory factors for livestock sellers and non-sellers

Variable Description	Non-Participants N = 130	Participants N = 27	F-Stats
Value of livestock owned (in R100)	41	171	21.89*
Pensions earned (R)	3993	1720	7.36***
Salary and wages earned (R)	9602	5978	1.01
Income from business activities (R)	556	6144	24.25***
Household head is female	0.23	0.44	5.08**
Age of household head (years)	58.13	54.89	1.71
Household size in adult equivalent	4.98	4.57	0.95
Average education of the household (yrs)	7.44	7.72	0.36
Size of arable land (ha)	2.93	3.95	1.72
Ownership of a tractor or vehicle	15%	26%	1.74
Distance to nearest (regional) town	-27.35	-26.11	0.22
Road conditions to nearest town are good	33%	26%	0.52
Farming learnt through extension visits	73%	63%	1.07

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

Although it does seem that access to assets such as livestock and non-farm income tends to significantly differentiate between the sellers and non-sellers. Similarly, female-headed households show an inclination towards the selling of livestock. Earning of pensions also tends to distinguish sellers and non-sellers. The results suggest that most of the pension earners (typically elderly) are not motivated to sell livestock. It appears, however, that information and proximity to the nearest town does not show any importance in differentiating the selling and non-selling groups.

4.4.3 The maize market

The commercial orientation of households selling maize is normally viewed with scepticism since maize is mainly regarded as a food crop. The primary objective of producing maize is to meet consumption needs. Only when these are met farmers will consider selling some maize. Another reason for this concern pertains to the fact that maize is a low value commodity. As such, maize selling may also be a spill over of access to markets for other commodities. This is illustrated by the fact that about 41% of households selling maize also sell horticulture and other field crops. Only about 25% of the maize sellers also sell livestock. Table 4.19 shows the mean values of variables of commercial orientation of maize sellers and non-sellers.

Table 4.19: Mean comparison of commercial orientation between sellers and non-sellers of maize

Variable Description	Non-Participants N=125	Participants N=32	F-Stats
Selling livestock	15%	25%	1.72
Selling horticultural crops	13%	41%	14.12***
Selling other field crops	16%	41%	9.767***
Mean value of livestock sold (R)	352	1038	2.93*
Mean value of horticulture sold (R)	1582	1978	0.073
Mean value of other field crops sold (R)	352	875	4.82**

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

The production and consumption of maize is a pertinent factor when sellers and non-sellers of maize are compared. Table 4.20 provides the summary of results. Other

than maize sellers producing significantly more maize and getting a higher selling price than the non-sellers, the two groups tend to have very similar attributes.

Table 4.20: Mean comparison of production, prices and consumption between maize sellers and non-sellers

Variable Description	Non-Participants N=125	Participants N=32	F-Stats
Maize production (# of 80 kg bags)	9.15	31.47	69.85***
Maize consumed (# of 80 kg bags)	2.70	4.53	2.60*
Maize exchanged for maize meal (# of 80 kg bags)	6.49	9.59	2.13
Maize selling price (R / bag)	60.256	76.38	49.94***
Maize purchase price (R / bag)	126.87	123.34	1.29
Value of livestock consumed (R)	141.25	315.31	2.44
Value of other crops consumed (R)	144	134	0.03

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

Those farmers selling maize are believed to possess better attributes in the form of endowments and access to information enabling them to enter markets than those that do not sell. Table 4.21 summarises the means of the explanatory variables. Maize sellers seem to have more income from business activities, more arable land, own a tractor or vehicle, and they have access to better roads. These sellers also have fewer members in the household.

Table 4.21: Comparing explanatory variables for maize sellers and non-sellers

Variable Description	Non Participants N = 125	Participants N = 32	F-Stats
Value of livestock owned (in R100)	61.35	71.51	0.133
Pensions earned (R)	3638	3452	2.93
Salary and wages earned (R)	8549	10623	0.374
Income from business activities (R)	1048	3366	4.22**
Household head is female	0.29	0.19	1.42
Age of household head (years)	57.97	55.97	0.73
Household size in adult equivalent	5.12	4.11	6.97***
Average education of the household (yrs)	7.45	7.65	0.21
Size of arable land (ha)	2.53	5.25	15.01***
Ownership of a tractor or vehicle	0.14	0.31	5.71**
Distance to nearest (regional) town (km)	-28	-24	2.56
Road conditions to nearest town are good	0.27	0.50	6.27**
Farming was learned through extension visits	0.73	0.66	0.60

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

4.4.4 The other field crops market

The indicator of market participation of other field crops as constructed in the study aggregates several crops such as wheat, beans, coriander and grain sorghum. Some of the crops have higher commercial orientation, while other have less. Most of the farmers selling these commodities also sell other commodities: about 39% and 36% of the households also sell maize and horticultural crops, respectively. Relatively fewer farmers (about 18%) also sell livestock. Table 4.22 shows mean values of sellers and non-sellers.

Table 4.22: Mean comparison of commercial orientation between sellers and non-sellers of other field crops

Factor	Non Participant N = 124	Participants N = 33	F-Stats
Mean value of other field crops sold (R)	0	2182	180***
Selling maize (%)	15	39	9.77***
Selling livestock (%)	17	18	0.03
Selling horticultural crops (%)	14	36	9.30***
Mean value of maize sold (R)	225	457	2.29
Mean value of livestock sold (R)	574	185	0.95
Mean value of horticulture sold (R)	1707	1498	0.02

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

The production and consumption of sellers and non-sellers of other field crops are compared in Table 4.23. Apart from the maize produced and the mean value of other field crops consumed, there are no major differences emerging from this comparison. The fact that participants consume most of other field crops implies that selling depends on production. That is, the more of other field crops is produced the more likely that some will be sold.

Table 4.23: Comparing production and consumption of other field crop sellers and non-sellers

Factor	Non Participant N = 124	Participants N = 33	F-Stats
Maize produce (# of 80 kg bags)	13.11	15.91	3.51*
Maize consumed (# of 80 kg bags)	3.21	2.58	0.32
Maize exchanged for maize meal (# of bags)	7.16	6.97	0.01
Maize producer price (R / bag)	63.86	62.36	0.33
Maize purchase price (R / bag)	126	127	0.02
Value of livestock consumed (R)	170	200	0.07
Value of other crops consumed (R)	91	332	17.70** *

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

The households selling other field crops do not have access to assets that distinguishes them from those who do not sell (Table 4.24). With the exception of wheat and coriander, field crops are normally sold locally. Buyers also tend to collect the product bought. In the case of wheat and coriander, farmers sell as a group. The field crop farmers have less (but not significantly so) livestock, pensions and wages than those who do not sell. However, they receive an insignificant higher amount in business earnings. They are located further away from the nearest town, but the majority (about 67%) accesses the town through good road conditions.

Table 4.24: Comparing explanatory variables of sellers and non-sellers of other field crops

Variable Description	Non-Participants N = 124	Participants N = 33	F-Stats
Value of livestock owned (in R100)	64.971	57.58	0.07
Pensions earned (R)	3671	3335	0.18
Salary and wages earned (R)	10010	5115	2.16
Income from business activities (R)	1340	2206	0.59
Household head is female (%)	29	21	0.73
Age of household head (years)	57.39	58.25	0.14
Household size in adult equivalent	4.90	4.93	0.01
Average education of the household (yrs)	7.39	7.87	1.31
Size of arable land (ha)	2.95	3.66	0.96
Ownership of a tractor or vehicle (%)	18	15	0.12
Distance to nearest (regional) town (-km)	-26.71	-28.76	0.683
Road conditions to nearest town are good (%)	23	67	27.07***
Farming was learned through extension visits (%)	72	70	0.04

F-statistics are ANOVA tests; Significance level (1% = ***, 5% = **, 10% = *)

4.4.5 Non-participants

About 50% of the respondents did not participate in any of the agricultural markets. It is commonly believed that these farmers consume what they produce. A typical sample non-participant household produces about nine bags of maize, of which three are consumed straight away and the rest is taken to the co-operative or miller for processing and storage. These farmers face the lowest maize price of about R60 per 80 kg bag. They also consumed the least in livestock and other crops.

The non-participants are generally not well endowed in assets. Access to other assets is most unfavourable in comparison to participants; the area of arable land is about 1.83 ha on average, and just less than one % of households own a tractor or a vehicle. These households, however, did receive the highest amount in pensions. The households are located furthest away from the nearest town and only 17% of the households have access to good roads.

4.4.6 A comparison of households participating in markets

The commercialisation process follows two ways. Firstly, farmers can transit from the low commercial (or non-participating) stage to a higher level of participation as seen in the previous section. The second pattern involves switching from participating in one market to another. This section compares the attributes of the five groups of market participants including the non-participants (see Appendix 1.3.). The objective is to evaluate the explanatory factors distinguishing one group from another. The question is what would be required to move households from one group to another.

4.4.6.1 Horticulture vs livestock sellers

In terms of access to assets, horticulture sellers have more land (of about 6.49 ha), more pensions, salary and wages, and a higher proportion of households owning a tractor or vehicle compared to the livestock sellers. The livestock farmers own three times more livestock than the horticulture sellers, as would be expected. The livestock sellers also have more income from business activities. The livestock farmers have a larger proportion of female-headed households, and more heads of the household in a younger age group. This tallies well with the low amounts in pensions received by this group.

In terms of the potential to access information, it is found that the two groups have about the same level of formal education. The horticulture sellers are located closer to the nearest town with twice as many households using accessible roads to town

compared to the livestock sellers. Most of the horticulture farmers receive their farming information through the extension service.

4.4.6.2 Horticulture vs maize sellers

The horticulture sellers typical have access to more land (a hectare more) and less livestock (twice less) than the maize sellers. Maize sellers typically have more access to earnings from pensions, salary and wages, as well as from businesses. The maize sellers appear to be more diversified than the horticulture farmers are. They have a slightly higher proportion of household heads that are female, and heads that are slightly younger and with more or less the same level of education.

The horticulture and maize farmers have a very slight difference in their locations to the nearest town. The horticulture sellers have a greater proportion of households using accessible roads. Furthermore, a higher proportion of these farmers has access to farming information from the extension service.

4.4.6.3 Horticulture vs other field crops sellers

The horticulture sellers have almost twice as much arable land, but have less value of livestock. A higher proportion of households in this group owns tractors or vehicles. These also have more earnings from salary and wages, but less earnings from pensions and business. Furthermore, a lower proportion of female-headed households in this group who are from the younger age group.

The education levels in both groups are relatively the same. The horticulture sellers are located relatively closer to the nearest town, but the same proportion of households in both groups has access to good roads. Most horticulture farmers get their information from the extension service.

4.4.6.4 Livestock vs maize sellers

The livestock sellers own more livestock, but less arable land than the maize sellers. They also receive more income from business, but less from pensions, salaries and wages. The livestock sellers have a larger proportion of female farmers and are slightly younger but with more AE members.

The livestock farmers are located further away from the nearest town and a smaller proportion of households have access to good roads.

4.4.6.5 Livestock sellers vs other field crops sellers

Livestock sellers own more livestock and arable land than sellers of other field crops do. They also earn more income from salaries and wages, as well as from business activities. However, these farmers receive less in pensions. They have a large proportion of female farmers with, typically, a younger age. The households are composed of relatively fewer AE members.

The households in both groups have more or less the same level of education. The livestock sellers are closer to the nearest town but a lower proportion of households has access to good roads. The proportion of farmers getting information from the extension service is lower.

4.4.6.5 Maize and other field crop sellers

Both these groups of participants are involved in low value enterprises. However, their attributes are different. For example, maize sellers are generally better off in terms of access to assets than the other field crop sellers. The maize sellers have more arable land, own more livestock, earn more non-farm incomes, and have a higher proportion of households owning tractors and vehicles.

The maize sellers are located closer to the nearest town, but have a lower proportion of households accessing good roads. The maize sellers have a slightly lower proportion of female heads of the household who are, typically, younger. They also have a slightly lower level of formal education.

4.5 SUMMARY

The evidence presented in the previous sections suggests that the sellers generally have better attributes in terms of assets and information to access. The sellers of high value crops have better access to assets and information than those who engage in low value crops.

A closer look into the descriptive statistics comparing the five categories of households indicates that livestock farmers tend to have more livestock, while the maize farmers have less than half of the livestock the livestock farmers have. Horticulture sellers have the lowest value of livestock owned. However, they tend to own more arable land and a higher proportion of households owning tractors or vehicles. In this respect they are almost equivalent to the maize sellers. Regarding access to liquid assets, maize sellers and horticulture sellers have the highest earnings from salaries and wages. Maize sellers and non-participants receive high amounts in pensions. Livestock sellers and maize sellers receive a higher income from business activities.

Livestock sellers, followed by non-participants, have a higher proportion of female-headed households. The other field crop sellers and non-participants consist of generally older households with more AE members. The sellers of other field crops, followed by the horticulture sellers, have a slightly higher level of education. They also have higher proportions of households using accessible roads. Horticulture and maize sellers are, typically, located closer to town. Horticulture sellers and non-participants tend to rely more on the extension service.

Based on the previous discussion, we assume that the attributes distinguishing horticulture sellers from the other groups include size of the arable land, ownership of a tractor or vehicle, the distance to the nearest town as well as contact with extension services. Access to salaries and wages, the education level and the road conditions might also play a role. The attributes distinguishing sellers of livestock from the other groups include the value of livestock owned, access to income from

business activities, and gender. Maize sellers are distinguished by access to salary and wage income, ownership of tractors or vehicles. The distance to the nearest town, ownership of livestock, income from pensions, business and arable land also plays a distinguishing role. Sellers of other field crops are distinguished by the age of the head of the household, average education, and road conditions. Income from pensions, and household size also play a role. Non-participants normally receive more income from pensions and they have the largest household size. Gender and age of the head of the household might also be contributing factors to non-participation.

Basically, the non-participants have less access to assets and information in comparison to participants. But also, participants tend to display different profiles of access to assets and information.

The next chapter will provide analytical tests to determine if these observed trends do, indeed, explain the commercial behaviour of different households.