

A REINTERPRETATION OF THE VALUE ATTRIBUTES OF AGRICULTURAL LAND FOR THE VALUATION OF FARMS BOUGHT FOR LIFESTYLE PURPOSES

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Dissertation presented for the degree of Doctor of Philosophy (Agriculture)
at Stellenbosch University

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March 2009

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ABSTRACT

Traditionally, agricultural land was regarded mainly as a production factor. Accordingly, in their application of the market sales comparison approach to agricultural land, valuers relied on a set of attributes related to agricultural production as the primary determinants of an agricultural property's highest and best use (HBU) and market value. These characteristics were measurable and related to the property's income-generating capacity.

The emergence of a multi-functional rural land market with alternative uses of agricultural land, such as for lifestyle purposes, has transformed this concept. Lifestyle inspired buyers often focus on a wider range of attributes not necessarily related to income, but associated more with satisfaction derived from the property. This creates a measurement problem for agricultural land valuers, as the characteristics valued by lifestyle buyers are more intangible and subjective, which leave valuers without a base from which to value such properties. The presence of lifestyle inspired buyers makes agricultural land valuations more demanding as it implies different interpretations of the same farm and complicates the choice of a single HBU.

The continued use of familiar conventional farming attributes by valuers when valuing farms where lifestyle motivations are present, and the omission of less measurable characteristics, implies that the market sales comparison method cannot be executed accurately. The objectives of the study were twofold: to reveal the dominance of value attributes applicable to farming as HBU when valuing farms bought primarily for lifestyle purposes and to identify the characteristics of land important to lifestyle inspired farm buyers.

A mixed method research strategy that consisted of a qualitative phase (case study), followed by a quantitative phase (survey), was carried out. The purpose of the case study was to determine whether the value attributes considered by lifestyle buyers differed from those used by valuers in valuation reports and to identify 'new' attributes as considered by lifestyle buyers. These were included in a quantitative survey of agricultural land owners within an intensive and extensive area in the Western Cape Province of South Africa, in order to determine statistically whether the considerations of lifestyle and production oriented buyers differed. The use of a mixed method approach combined the strengths of both qualitative (identification of new considerations) and quantitative methods (confirmation of statistical significance of newly identified considerations) to provide comprehensive results.

The results of the qualitative phase indicated a discrepancy between the reasoning of valuers and the typical lifestyle buyer: valuers predominantly used familiar production related characteristics when valuing farms bought for lifestyle purposes. The statistical results showed that lifestyle and production oriented buyers thought differently about the value attributes of agricultural properties. Demographic differences between these types of buyers were also highlighted. Respondents' understanding of the terms "beautiful view" and "natural scenery" were explored in order to provide more clarity regarding what they regarded as "aesthetic beauty". A multiple perspective approach to agricultural land valuations where the highest and best use is uncertain is proposed.

OPSOMMING

Landbougrond is tradisioneel hoofsaaklik as 'n produksiefaktor beskou. In hul toepassing van die vergelykbare marktransaksie benadering, het waardeerders van landbougrond gesteun op 'n stel waardedraende eienskappe wat kenmerkend van landbouproduksie was as die primêre aanduiding van 'n landboueiendom se mees voordelige gebruik en markwaarde. Hierdie eienskappe was meetbaar en verwant aan die eiendom se inkomstegenereringskapasiteit.

Die verrysing van 'n multifunksionele grondmark waar alternatiewe gebruike van landbougrond aan die orde van die dag is, soos byvoorbeeld vir leefstyl-doeleindes, het hierdie opvatting omver gewerp, aangesien leefstyl-geïnspireerde kopers dikwels op 'n wyer verskeidenheid van eienskappe konsentreer, wat nie noodwendig verband hou met inkomste nie, maar nouer verwant is aan die genot wat hulle uit die eiendom put. Dit veroorsaak 'n kwantifiseringsprobleem vir waardeerders, aangesien die eienskappe waaraan leefstylkopers waarde heg minder tasbaar en ook subjektief is, wat daartoe lei dat waardeerders geen basis het waarteenoor sulke eiendomme gewaardeer kan word nie. Die teenwoordigheid van leefstylkopers maak dus landbouwaardasies meer veeleisend omdat dit verskillende interpretasies van dieselfde plaas behels, wat op sy beurt die keuse van 'n mees voordelige gebruik kompliseer.

Die volgehoue toepassing van gebruiklike boerdery eienskappe op eiendomme waar leefstyl-oorwegings teenwoordig is, en die weglating van minder meetbare eienskappe, bring mee dat die vergelykbare marktransaksie metode nie akkuraat uitgevoer kan word nie. Die doel van hierdie studie is om die oorheersing van eienskappe wat met boerdery as mees voordelige gebruik gepaard gaan in waardasies van plase wat hoofsaaklik vir leefstyl-doeleindes aangekoop is te openbaar, en om die waardedraende eienskappe wat vir leefstylkopers belangrik is, te identifiseer.

'n Gemengde metode strategie is uitgevoer, wat bestaan het uit 'n kwalitatiewe fase (gevalllestudie), opgevolg deur 'n kwantitatiewe fase (opname). Die mikpunt met die gevalllestudie was om te bepaal of die waardedraende eienskappe wat deur waardeerders in hul waardasieverslae gebruik is verskil het van die van leefstylkopers, en om "nuwe" eienskappe soos deur leefstylkopers oorweeg, te identifiseer. Hierdie eienskappe is dan in 'n kwantitatiewe opname van landbougrondeienaars binne 'n intensiewe en ekstensiewe area in die Wes-Kaap Provinsie in Suid-Afrika ingesluit met die doel om statisties te bepaal of die oorwegings van leefstyl en boerdery-georiënteerde kopers verskil. Die gebruik van 'n gemengde metode benadering kombineer die sterkpunte van beide die kwalitatiewe

(identifisering van nuwe oorwegings) en kwantitatiewe (bevestiging van statistiese beduidendheid van nuut-geïdentifiseerde oorwegings) metodes en verskaf uitgebreide resultate.

Die resultate van die kwalitatiewe fase het daarop gedui dat daar 'n teenstrydigheid was tussen die waardedraende eienskappe van plase soos beredeneerd deur waardeerders en tipiese leefstylkopers: waardeerders het hoofsaaklik bekende produksie georiënteerde eienskappe gebruik in hul waardasies van plase wat vir leefstydgoelendes aangeskaf is. Die statistiese resultate het daarop gedui dat leefstylkopers en kopers gemotiveer deur boerderydoelendes verskillend dink oor die waardedraende eienskappe van plase. Demografiese verskille tussen hierdie twee groepe kopers is ook uitgewys. Kopers se begrip van die terme “'n mooi uitsig” en “natuurskoon” is ook ondersoek om sodoende praktiese inhoud aan die begrip “mooi” te gee. 'n Multiperspektiewe benadering in die waardasie van landboueiendomme waar die mees voordelige gebruik onseker is, is voorgestel.

ACKNOWLEDGEMENTS

This study would not be possible without the support, assistance and participation of various individuals and organisations. I would gratefully like to acknowledge the help of following people:

Prof. Theo Kleynhans, for his unfailing support, motivation, guidance and dedication throughout this study.

Steven, for his moral support and encouragement.

My family, for their support and interest.

The Western Cape Department of Agriculture for financial and logistical assistance.

Oom Jorrie (Jordaan valuers) for his guidance, knowledge sharing and constructive criticism.

Willem de Lange (CSIR), for his encouragement and willingness to assist with the testing of ideas.

Mike Wallace (Western Cape Department of Agriculture) for his support and GIS assistance.

Prof. Daan Nel (Centre for Statistical Consultation, Stellenbosch University) for the statistical analysis.

Prof. Johan Mouton (Centre for Research on Science and Technology, Stellenbosch University) for his input regarding the methodology.

The valuers who provided me with cases to use in the case study for their contributed time and effort.

The various parties (buyers, sellers, estate agents) who participated in the case study.

The expert panel of valuers for their comments on the questionnaire.

Members of the public who took the effort to complete and return the questionnaires.

Louis Coetzee and Wellington Sikuka for capturing the questionnaire data.

Marius Kieck, for helping to locate respondents.

Mireille Lewarne (Western Cape Department of Agriculture) for her interest.

Patricia Leitich for the thorough editing of this document.

The municipalities of Laingsburg, Beaufort-West, Stellenbosch, Drakenstein and Witzenberg for their willingness to provide data.

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ABBREVIATIONS

CAQDAS	-	Computer Assisted Qualitative Data Analysis Software
GIS	-	Geographic Information Systems
HBU	-	Highest and Best Use
HPM	-	Hedonic Pricing Models
LOOP	-	Law of One Price
LSU	-	Large Stock Unit
MFU	-	Most Fitting Use
MPP	-	Most Probable Price
MPU	-	Most Probable Use

1. INTRODUCTION AND ORIENTATION

Rural land has many characteristics that represent value to prospective buyers. Traditionally agricultural land was valued for its productive capacity, implying that its extrinsic value as a production factor generating income was the main determinant of its market value. Agricultural value was synonymous with market value. Worldwide the rural market is undergoing complex demand and supply changes: technological innovation in agriculture drives the decreasing terms of trade and the decreasing returns on investment in primary agricultural production, and with that, the growing redundancy of land as production factor. On the demand side, some high net worth buyers of agricultural land from outside the agricultural sector seem to be attracted to the intrinsic value of the land, where non-financial considerations of owning the land are important. The description “extrinsic” as applied here refers to the value of characteristics as a means to an end (e.g. production for income purposes), whereas “intrinsic” relates to the characteristics of land as an end in themselves.

There is a transition in the use of agricultural land primarily as a factor of production towards a multi-functional environment where alternative uses are evident. Alternative use buyers focus on different characteristics, where the fulfillment of personal expectations, recreation and conservation motivations, among others, are prominent. In this multi-functional agricultural landscape, the value of land does not only represent its agricultural potential, but other values as well.

There are numerous reasons for the trend towards a multi-functional agricultural landscape. High economic growth rates have led to increased incomes, and thus higher disposable incomes and an increased demand for leisure time. At the same time population growth has resulted in congested cities, while improved technology has made commuting to rural areas more accessible and enabled people to work from home. Attitudes have shifted towards a preference for the conservation of areas in their natural state (appreciation of amenities) and performing outdoor activities.

The market sales comparison method is the preferred method for determining the value of agricultural properties. According to this method, the property to be valued (subject property) is compared with properties recently sold in the surrounding area, selected on the basis of a similar use as that of the subject property. Valuers base their valuations on the highest and best use (HBU) they envisage for a property. The HBU is defined as the use that generates the highest profit or satisfaction for the “typical” buyer at that moment in time. For this reason the choice of a specific

use is a critical step in the valuation process. In order to determine the subject property's market value, valuers use agricultural properties with a similar HBU as that of the subject property in their comparative analysis. Applicable adjustments are then made to allow for physical or other differences in properties. The mental construct of a "typical buyer" for certain types of properties also guides the valuation process.

It follows that the value attributes of a property provide a vital link that assist valuers in their decision of the HBU and a typical buyer for a property. The selection of the HBU implies the acceptance of a set of related value attributes. For instance, value attributes applicable to agricultural production as HBU relate to the productive characteristics of the farm, such as soil fertility, water availability for irrigation and the condition and functionality of on-farm improvements, such as a wine cellar. Therefore characteristics that enhance the income generating potential of the farm through agricultural production are identified and compared with farms where the productive potential is paramount.

When agricultural properties are bought for alternative uses, other attributes, such as the recreation potential of the land, or the conservation of fauna and flora, as well as aesthetics associated with unspoiled natural landscapes and the (temporary) escape from city life, supposedly play a significant role. These lifestyle buyers seem to be less dependent on the income generated from farming activities on the property in the financing of such transactions. The income generating capacity from farming might be secondary or even absent. In some instances the income potential from alternative uses of land not related to farming, such as tourism or accommodation facilities might be present. These buyers have diverse preferences and are often willing and able to pay a premium for properties that satisfy their unique demand and lifestyle.

The presence of both farming oriented and lifestyle inspired buyers in the agricultural land market suggests different interpretations of the same property, emphasising different attributes of the property and priorities of the buyers. The choice of one use as the highest and best is embedded in the valuation principle that a property can have only one market value at a specific point in time. This is problematic in a multi-functional environment, where different value attributes are connected to alternative uses and different preferred interpretations of the same property. For this reason the accurate assignment of a particular HBU by valuers in an agricultural land market with both farming and lifestyle inspired transactions is more demanding than the obvious choice of farming as the HBU (by default) and the concomitant use of typical farming related characteristics. In addition, the term "highest and best use" has been the subject of much criticism in valuation

literature, as it can be applied as the use that maximises income (production purposes) or uniquely personal satisfactions (lifestyle purposes). At the moment it seems as if there is no clear distinction between farms bought for lifestyle purposes and those bought for farming reasons.

1.1 Research problem structuring

The transition from an agricultural land market that was predominantly production oriented towards a multi-functional landscape where numerous alternative uses are present complicates the valuation process as uncertainty regarding the motives of buyers (and hence the use) of specific properties increase. The conventional farmer as typical buyer, with his set of related attributes that are primarily connected to production variables and the comparison with properties that have similar characteristics and subsequently a similar HBU has been replaced with different types of buyers, who have different motivations for buying farms and focus on different characteristics. The multi-functional nature of agricultural land suggests a proliferation of uses, from which the HBU with respective characteristics need to be identified. These range from consumptive uses to amenity uses, with a spectrum of other uses in between.

The inflexibility in valuation principles regarding HBU and market value, as well as valuers' familiarity with agricultural production as the HBU of farms and their unfamiliarity with other types of buyers obstructs thorough investigations into alternative uses of land before the decision of a specific HBU is made. At the same time, the intangible and subjective nature of some characteristics of agricultural properties that are not related to income derived from the property present valuers with a measurement problem, which is aggravated by time and fee constraints for conducting valuations.

The question arises whether the effectiveness of the selection of an appropriate HBU for an agricultural property could be enhanced and the valuation of lifestyle farms be improved in a multi-functional agricultural land market where both farming and lifestyle motivations are present? In other words: How does one value an agricultural property where there is uncertainty about its HBU?

1.2 Orientation and the research problem in context

The heterogeneous character of land lends itself to a variety of uses. This means that the same farm can be interpreted differently by different buyers, depending on their focus on selected aspects of the land. Every use application has its own “set” of value bearing characteristics, which vary for different types of uses.

The characteristics associated with agricultural production as HBU focuses on objective, tangible characteristics which are related to the income generating capacity of the property and can be measured scientifically. Lifestyle buyers focus on a wider range of characteristics, which are often intangible, subjective and open to multiple interpretations. For many such buyers the direct consumption attributes of the land (utility derived for example from enjoyment of aesthetic beauty, game viewing and other outdoor activities) seem to be more important than the production attributes of the land for income purposes. This suggests a different valuation inventory with different value attributes. Some of these value attributes might add value for one type of buyer, while detracting from it for another. Mountainous land is often not the most productive for farming purposes, but for lifestyle buyers it offers undisturbed views and a natural setting. The number of characteristics and use options, together with the interaction between them, increases uncertainty and make agricultural land valuations more complex.

For this reason the choice of the HBU on agricultural properties that maximises satisfaction or utility is challenging, because it depends on personal circumstances and subjective motivations – which lies within the realm of behavioural science. Valuers feel more comfortable using a factual viewpoint in the determination of value than focusing on subjective human mental processes, even though market value is the product of these mental processes. They are reluctant to expand their valuations to include subjective motivations of buyers, as they do not know how to measure these motivations quantitatively. Multiple perspectives regarding the use of land and the characteristics associated with each use blur the choice of the HBU and typical buyer, causing agricultural land valuations to become more demanding.

Herein lays a fundamental theoretical issue – traditionally valuers focused on the best use of the land and selected characteristics that expressed this chosen HBU. It is suspected that valuation reports on agricultural properties bought for lifestyle considerations, where the productive potential of the land enjoys a low priority, still focus on production oriented characteristics and production as

the HBU. Valuers rely on the conventional productive characteristics in their valuations of agricultural properties with farmers as typical buyers, because of their familiarity with this land use.

Several problems with the current situation necessitate the need for a different approach in the valuation of farms bought for lifestyle purposes. Valuation theory states that valuers need to assess buyer motivations and be able to think like 'typical' buyers. This study takes a deductive approach, where there is a movement from the typical buyer in general to the lifestyle buyer in particular. The use of inappropriate value attributes or omission of relevant considerations could lead to inaccurate valuations (both under- or over valuation) of agricultural properties. Experienced valuers have expressed concern over the fact that they are unable to correctly analyse the thought processes of buyers and fear that they could be held accountable for being negligent by not incorporating lifestyle buyers into their analyses. In conversations with valuers at the onset of the study it became clear that looking at a farm's agricultural value and then adding a premium for lifestyle purposes (as is done in many cases) in order to estimate market value could be risky as it becomes more subjective and therefore difficult to defend in a court of law. They admit that a simple Rand per hectare calculation is not fitting, but that it is difficult to find comparable transactions, because these fluctuate widely. In essence valuers feel that there are no guidelines or "method in the madness" when it comes to valuing lifestyle properties, increasing the risk of performing "wrong" valuations.

The current valuation method has not necessarily resulted in lifestyle purchasers being unable to finance farms bought for lifestyle reasons, as many of these buyers are high net worth individuals who do not rely on financing from lending institutions for such purposes (or they may require minimal loans only). However, valuers have a responsibility to undertake realistic valuations for clients in order to minimise financial exposure. For this reason several valuers have acknowledged that they would rather err on the conservative side by giving more preference to the agricultural value of farms (which in most cases are lower than market value) than running the risk of being held accountable for an inaccurate valuation that would cost a lending institution money, for instance if interest rates increase and the institution cannot realise the loaned amount (based on the valuation) on a repossessed property. At the same time existing and prospective farmers compete with lifestyle buyers when purchasing farms. In especially extensive areas, the size of farms used for commercial agriculture has tended to increase in order to remain economically viable. For this reason lifestyle valuations impact on the commercial agricultural sector as well, which support the need for a different approach to farm valuations.

This leads to questions regarding which characteristics are important for production oriented buyers (farmers) on the one hand and lifestyle buyers on the other, and to which extent these types of buyers differ. What should the mental picture of a typical buyer look like, given the presence of more than one potential buyer for an agricultural property that is suitable for farming or something else, such as conservation? Must alternative use transactions be treated as exceptions? When the number of alternative use transactions increases in an area, is there a threshold after which they should be incorporated into HBU analysis and how should these uses be incorporated – as replacement for conventional farming, or as an addition to it? What is the probability of conventional farming as use against alternative uses? The probability of one type of use against another is impossible to determine without extensive market information and analysis. Can the characteristics of rural properties be used from the onset to classify them in terms of a particular HBU? The average value in Rand per hectare is used as the point of departure, but do buyers interested in alternative uses of land also start at a Rand per hectare value and then adjust it upwards or downwards depending on the characteristics they value?

Two options emerge from these questions. Firstly, valuers can choose the HBU for a property (based on its most probable use) before embarking on a valuation and then determine its market value based on that use, emphasising the characteristics relevant to that use alone. Secondly, valuers can value the property for every possible use and provide the client with two valuations (in the case of a farm suitable for production or conservation, for instance). This is in conflict with valuation theory stating that a property can have one value only at a specific point in time. This option is problematical when multiple uses are likely, as it limits the valuation process and use of the market sales comparison method (which relies on the simulation of the thought processes of a buyer and seller with regard to the attributes that bear value), and could lead to a loss of potentially useful information for the client.

The choice of a particular HBU acts like a blinker, as attributes not relevant to that HBU are ignored. A valuer who is “open” towards more attributes, however, could perhaps realise during the investigation/valuation that the subject property has many lifestyle characteristics and would be better suited towards the HBU based on lifestyle and value it accordingly. Valuer practices require an early choice of the HBU for a property in order to guide the valuation process: a valuer must first and foremost decide on the HBU, and most of the valuation work is done after this decision has been made. With transitional properties where the HBU is not clear-cut, the opposite *modus*

operandi might be more beneficial: to postpone the decision of the HBU until an investigation of the market has been done and more information has been gathered, after which the valuer would be better equipped to determine with which “lenses” to look at a property and choose the HBU. This corresponds with the approach forwarded in complexity theory, which states that more information must be collected and decision making delayed (i.e. choice of HBU) when dealing with complex issues.

A further problem is that valuers are in the habit of focusing on agriculturally productive characteristics, even though they might be aware of lifestyle considerations on a property. They tend to default back to the more familiar and measurable characteristics. Other uses and the likelihood thereof will only become evident once valuers include these in their valuation reports.

Following these discussions, two hypotheses can be formulated:

- The choice of the HBU without in-depth analysis of different types of buyers and the attributes of the property associated with each type of buyer causes substantial differences in the attributes perceived as important by valuers and buyers. For this reason valuers mostly apply farming related variables when valuing farms bought primarily for lifestyle purposes.
- The applicable value attributes of lifestyle motivated buyers diverge from the buyer that is primarily production oriented and this can be statistically regressed.

The objectives of the study are as follows:

- To reveal the dominance of value attributes applicable to farming as HBU when valuing farms bought primarily for lifestyle purposes.
- To identify the characteristics of land important to lifestyle inspired farm buyers.

To summarise, the research question and objectives revolve around the complexity of agricultural land valuations, because of its heterogeneous nature. The transition of land use from being predominantly production oriented towards a multi-functional landscape with multiple uses complicates and increases the uncertainty of the decision of the HBU, as agricultural land possesses many characteristics that could potentially have value, depending on the perspective used. The emergence of buyers with lifestyle motivations indicates the need for the consideration of multiple perspectives in valuation. Valuers cannot assume production as the HBU of an agricultural property before alternative uses have been explored, as this would compromise informed decision making and lead to substandard valuations that do not reflect the market.

This study investigates the use of multiple perspectives when there is uncertainty regarding the HBU of agricultural land where multiple land uses are evident. The dominance of conventional farming characteristics in the valuation of all agricultural land is investigated, and the characteristics that appeal to lifestyle buyers specifically are identified by drawing on a mixed method approach, which is carried out in a qualitative and quantitative stage.

1.3 Chapter layout

This dissertation is presented in five chapters. The orientation, structuring of the research problem and structure of the study was provided in Chapter 1. The rural change phenomenon and concomitant movement towards a multi-functional agricultural landscape is summarised in Chapter 2: this chapter provides a description of current thinking in the field of valuation as indicated in the literature. For this reason it also serves as the theoretical base of the study, with discussions of market value and HBU as the essence of the market sales comparison approach. Problems associated with these concepts and possible solutions are also discussed.

Chapter 3 discusses the methods used in the identification of the value attributes preferred by lifestyle buyers, and whether these attributes differ from those included in valuation reports and those emphasised by production oriented buyers. A mixed method research approach was followed, consisting of a qualitative phase followed by a quantitative phase. The qualitative phase forms the basis of the study consisting of 16 cases, where all parties involved in transactions where lifestyle considerations were present (e.g. buyer, seller, valuer and estate agent) were interviewed in order to explore the motivations of such buyers. The results from the qualitative phase were included in the quantitative phase, which consisted of a survey. During this phase questionnaires were sent out to buyers of agricultural land in an intensive and extensive area within the Western Cape Province in South Africa to determine the preferences of lifestyle and production oriented buyers. The objective of the quantitative section is to test the outcome of the qualitative phase and to provide more certainty regarding its results. The outcome of the mixed method research, including the results of the survey, is discussed in Chapter 4. Chapter 5 is reserved for the conclusions, summary and recommendations.

2. LITERATURE REVIEW

2.1 Introduction

The aim of this literature overview is to familiarise the reader with the trend towards a multi-functional rural land market where a range of alternative non-agricultural uses are evident, and to point out the implications of this trend for the valuation of agricultural land. The fundamentals of valuation and valuation theory are explained to sensitise the reader to the complex nature of valuations. This includes information on the market sales comparison approach as the preferred method for the valuation of farms, as well as the terms market value and HBU, and problems associated with the application of these terms within the valuation context. These are then contextualised in the agricultural environment. The implications and effects of the transition from a one-dimensional agricultural land market dominated by productive capacity towards a multi-dimensional market on valuation procedures are highlighted. The need for additional and improved information in valuation reports, complemented with comprehensive analysis and the use of a multiple perspective approach when the decision of the HBU is uncertain, is discussed.

2.2 Rural change and the phenomenon of a multi-functional agricultural land market

Worldwide there has been a transition from utilising agricultural land primarily for agricultural production and income opportunities, towards a multi-functional environment where alternative non-agricultural uses are apparent (Adams and Mundy, 1991:48, 52; Brandt and Vejre, 2004:11; Green *et al.*, 2005:1; Holmes, 2006:142; Maybery *et al.*, 2005:59; Mundy and Kinnard, 1998:207; Pope, 1985:81; Prag, 1995a:1; 1995b:1, 12; Roberson, 1997:114). Multi-functionality refers to the characteristics of agricultural land that simultaneously provide environmental, economic, social and amenity functions (Parris, 2004:211). It focuses on landscapes as systems, and the variety and diversity within agricultural landscapes, together with the values derived from different functions performed by landscapes.

Agricultural landscapes provide many types of values, which can be economic, where a direct monetary benefit can be derived from income, and non-economic, where a property provides a non-monetary benefit (Palang *et al.*, 2004:221). Non-economic values are often intrinsic and relate to

natural, historic, cultural, aesthetic and symbolic values (Antrop, 2004:166, 169). These values are formed within the minds of people and vary depending on each person's own value system. They are unrelated to the income derived from the property and cannot be measured directly (Healy and Short, 1978:198). Non-agricultural considerations, such as proximity to natural amenities and access to open space, together with recreation and conservation opportunities manifest themselves as new drivers of agricultural land prices (Adams and Mundy, 1991:48-49; Agra Europe, 1991:1-2; Barron and Dickinson, 1975:147-148; Pope and Goodwin, 1984a:750-751; Roberson, 1997:114; Tait, 1984:84; Wittenberg *et al.*, 2005:1-2).

Reasons for buying rural land range from the desire to own land for a country retreat or as a status symbol (Pope and Goodwin, 1984a:753), to the enjoyment of natural scenery, wildlife habitat and appreciation of historic heritage (Hendy, 1998:144-145; Kallas *et al.*, 2007:405-406; Leonard and Cobham, 1977:206, 214-215) and the enjoyment of outdoor recreation and sporting activities, as well as hobby farming (Pope and Goodwin, 1984b:37; Tait, 1984:87).

These amenities are used by in-migrants, business people, second home owners, tourists, retirees for several purposes such as recreation, tourism, seasonal or second homes or retirement (Green *et al.*, 2005:2-3; Healy and Short, 1978:195-196, 198). Especially wealthy buyers from outside the agricultural sector seem to be attracted to the uniqueness of particular properties where buyers realise that there are some environmental features on the land that are unique, exclusive and cannot be reproduced or replaced by humans (Adams and Mundy, 1991:49; Roberson, 1997:115).

Multi-functionality recognises various uses of a piece of land. Traditionally such land was used for the income that it could generate through production and its value was related to this income, but the emergence of a range of alternative uses which could be mixed to a greater or lesser extent implies that the value of agricultural land has changed from being purely based on its productive capacity, towards a multi-functional landscape where many other uses are evident. Buyers' interests are varied and linked to different functions of the land (Brandt and Vejre, 2004:11; Healy and Short, 1978:186; Holmes, 2006:143; Xu *et al.*, 1993:356).

Different types of buyers with different uses in mind complicate the valuation process as more uses become relevant, while a piece of land could have multiple values and functions for different people at the same time (Drozd and Johnson, 2004:295; Healy and Short, 1978:186; Holmes, 2006:145; Maybery *et al.*, 2005:61; Palang *et al.*, 2004:230; Pope and Goodwin, 1984a:750-755). Valuers

need to know the preferences and motivations of buyers to make informed decisions (De Groot, 2006:175-176; Holmes, 2006:145; Inman *et al.*, 2002:72; Maybery *et al.*, 2005:61).

At the same time, the move towards an appreciation of land for aesthetic and emotional reasons presents a problem for valuers as these characteristics are intangible (Healy and Short, 1978:198). Where agricultural properties were previously valued based on the economically productive uses of their natural attributes (Adams and Mundy, 1991:51), many buyers at present are motivated rather by the intrinsic value in terms of scenery, wildlife habitat properties, wilderness and recreation opportunities of natural attributes, or option value (the opportunity of preserving the land or having an option to develop it later) (Adams and Mundy, 1991:48 - 49). The satisfaction or enjoyment buyers derive from these properties is subjective, vague, and not directly measurable, as satisfaction is not related to income (Shields *et al.*, 2005:83). As a result agricultural land valuations are becoming more complicated and uncertain.

There are many driving forces of the transformation of rural land from both the supply and demand side, as well as from interaction between these sides. Technological innovation in agriculture drives the decreasing terms of trade and the decreasing returns on investment in primary agricultural production, and with that, the growing redundancy of land as production factor (Archer, 1979:422; Barron and Dickinson, 1975:148; Hanson and Schwab, 1999:14; Holmes, 2006:143-144; Oltmans, 1995:57, 66; Wittenberg *et al.*, 2005:12). As a result more agricultural land becomes available for alternative uses.

Equally, economic growth leads to increased disposable income for households (Agra Europe, 1991:1; Healy and Short, 1978:185; Holmes, 2006:142-144; Maybery *et al.*, 2005:59; Sloane, 1976:285-286). According to the law of Engel, as the income of people increases, they tend to spend less on agricultural products (food) as a percentage of their income, and more on other luxuries (such as leisure) (Nicholson, 2000:84). As incomes increase, more money becomes available for and more time can be spent on leisure activities (Parris, 2004:197; Pope, 1987:181). Increased incomes around the world have led to a change in tastes and societal values, where people have become more environmentally conscious and desire to conserve and preserve natural habitats (Holmes, 2006:144; Irwin *et al.*, 2003:22; Libby, 2000:1; Maybery *et al.*, 2005:62-65). This increase in environmental values - sometimes called market driven amenity values - has boosted the market of agricultural land for consumptive use by buyers (Holmes, 2006:143).

Improved technology makes working from home through telecommuting possible, while improved transportation allows for longer distances between home and work (Inman *et al.*, 2002:72; Parris, 2004:197). The fast, pressurised life with long working hours and ever-expanding overpopulated cities with congested traffic has led to the need to escape from it all. As populations increase and more agricultural land is converted to urban or other uses, the demand for the remaining farmland as a scarce commodity increases (Irwin *et al.*, 2003:22; Libby, 2000:1). Rural areas with open space, close to natural amenities with aesthetic or recreational appeal has become an attractive alternative for high net worth individuals, either as a weekend retreat or holiday place, permanent rural residence or a place to cash in on other peoples' need for retreat through the provision of tourism or accommodation facilities (Holmes, 2006:147; Pope and Goodwin, 1984a:750, 755; Prag, 1995a:1; 1995b:1).

At the same time, there are people who have a deep-rooted desire to own land; they either grew up on a farm or the farming lifestyle has always appealed to them as a "way of life" (Healy and Short, 1978:196). Many purchasers buy agricultural properties as a hobby farm, where they can farm as a form of recreation, while maintaining an income from off-farm activities. The change in societal values towards the conservation and preservation of land as an amenity-oriented use has broadened the motivation for owning farmland (Archer, 1979:422; Holmes, 2006:143; Pope, 1985:85). The income generating aspect of agricultural land does not always contribute the most to its price and non-agricultural factors, such as the pure enjoyment of the land, are becoming important.

In this study alternative uses that are not primarily related to agricultural production are collectively referred to as lifestyle considerations. Although the productive potential of the farm (economic reasons) might have an influence on the decision of such buyers, they are also motivated by other factors. These buyers are in most instances not dependent on the agricultural income generated on the farm and are willing to pay more than the agricultural production value of the farm. In many cases agricultural landscapes are valued for their aesthetic appeal and natural amenities. Natural amenities are related to environmental quality and are those qualities in a region that makes it an attractive place to live and work. These relate to direct use values such as for consumptive purposes (e.g. fishing and hunting) and non-consumptive purposes (e.g. recreation, appreciation of aesthetic beauty such as scenic views), as well as indirect use values (e.g. preservation of an ecosystem and habitat for providing ecosystem functioning) and optional future use values. In other words, lifestyle buyer considerations focus on the intrinsic qualities of agricultural land for enjoyment, which are not easily measured in monetary terms (Blignaut and De Wit, 2004:56).

The rural transition towards a multi-functional landscape is not a new occurrence, but attempts to simplify the description of alternative uses of land have not been successful, as the phenomenon manifests differently in different countries (Agra Europe, 1990:1; 1991:1-2; Archer, 1979:422-423; Hardie *et al.*, 2001:120; Healy and Short, 1978:185-187; Hendy, 1998:145; Holmes, 2006:142, 158; Leonard and Cobham, 1977:205-214; Maybery *et al.*, 2005:59-60; Painter, 2004:112; Pope, 1985:81-85; Pope and Goodwin, 1984a:750; Prag, 1995a:5, 12; Sloane, 1976:286). However, the consequence is the same everywhere: rising agricultural land prices that are not always related to the production potential of the land (Hendy, 1998:144-145). Buyers are willing to pay a premium for agricultural land and primary production is not the decisive factor in their purchase decisions (Adams and Mundy, 1991:53; Hardie *et al.*, 2001:120; Healy and Short, 1978:198; Holmes, 2006:142; Mundy and Kinnard, 1998:210; Pope, 1985:82; Pope and Goodwin, 1984a:750; Prag, 1995b:12; Roberson, 1997:114). Non-agricultural factors play a role in buyers' motivations for purchasing rural land (Bastian *et al.*, 2002:337; MacPhillamy, 1964:209; Maybery *et al.*, 2005:59). Attempts have been made to identify the motivations for purchasing agricultural land. These are listed in Table 1.

In Australia, farm prices increased with the rise of the middle class (and income) and subsequent increased awareness of the environment (Archer, 1979:422-424). Interests for "hobby farms" increased, with factors such as location, distance to urban services, amenities, vistas, natural environment and surrounding development playing a role (Hendy, 1998:144-145). "City farmers" bought land to enjoy a country lifestyle while working in the city and used the income from farm production to pay overheads (Sloane, 1976:285-287). These farms could not be valued based on their productive income alone, as non-agricultural factors played a part in buyers' motivations for purchase (Tait, 1984:87). In France land prices increased after non-agricultural buyers interested in leisure, rural space and tourism entered the market. Buyers were interested in architectural or modern luxurious houses on agricultural properties and foreigners were also attracted to the French rural landscape (Agra Europe, 1991:2). Similar trends occurred in the United Kingdom, where buyers had access to different financial resources from farmers, and agricultural land values were determined by landscape resources for purposes such as recreation and sporting, private amenity, the historic character of the countryside, aesthetic values, diverse scenery and wildlife habitat (Leonard and Cobham, 1977:210-213; Prag, 1995a:12-13; 1995b:1).

Table 1: Summary of motivations for the purchase of agricultural land and categories of rural tenancy as depicted in the literature

Reference	Collective name	Motivation and categories of rural tenancy	Description
Archer (1979)	Types of smallholdings (0.4 – 40 hectares in size)	Full-time commercial farm	Dependent on farm income
		Part-time commercial farm (“rural residence”)	Part-time farmers in regular employment off-farm
		Resident hobby-farm	Use farm for rural hobby activities, income sourced from off-farm employment (farm within commuting range of cities)
		Non-resident hobby-farm (“weekend hobby-farm”)	Urbanites using farm for rural retreat on weekends, holidays (farm beyond daily commuting range)
		Retirement hobby-farm	Beyond weekend commuting range, for retirement
		Speculative	Long-term plans for land (use or development)
Pope (1985)	Components of rural land values	Productive component	Land input to production process
		Speculative component	Not provided
		Consumptive component	Land part of individuals’ utility functions, they want an investment that they can feel, touch and enjoy
Lombard (1993)	Categories of value of agricultural land	Agricultural value	Agricultural production for income purposes
		Investment value	Not provided
		Personal value	Enjoyment, “prestige”, tradition (agricultural land as consumer product)
Prag (1995)	Land buyers	Bare land	Non-farming users, developers, local farmers, new entrants, investors
		Vacant farms	Developers, local farmers, owner occupiers, new entrants, investors
		Let estates	Investors
		Let farms	Sitting tenants, investors
Kline and Wichelns (1998)	Attitudes/ preferences towards farmland policy	Environmental	Wildlife habitat, groundwater recharge, ecosystem protection
Hanson and Schwab (1999)	Non agricultural-use value	Residential	Not provided
		Commercial/ industrial	
		Recreational	
Maybery <i>et al.</i> (2005)	Farming values	Economic	Money and profit dominate (entrepreneur)
		Conservation	Conservation and improvement of land dominate
		Lifestyle (yeoman)	Rural environment and farming lifestyle dominate
Holmes (2006)	Multi-functional rural transition	Production	Agricultural production and overcapacity
		Consumption	Market-driven amenity uses
		Protection	Societal values concerned with sustainability and preservation goals
Holmes (2006)	Rural occupancy modes	Productivist agriculture	Production values dominant
		Rural amenity	Consumption values dominant
		Pluri-active	Mix of production and consumption values
		Peri-metropolitan	Intense competition on values
		Marginalised agriculture	Potential integration of production and protection values
		Conservation	Protection values emphasised
		Aesthetic	Rural landscapes, scenic quality
Agrarian	Framing as way of life, local produce		
De Groot (2006)	Landscape values	Ecological	Based on ecological sustainability
		Socio-cultural	Equity and cultural perceptions
		Economic	Based on efficiency and cost-effectiveness

Certain areas in the United States have been described as transformed from a working landscape to a leisure landscape for the purpose of leading a rural lifestyle, which is synonymous with quality of life (Inman *et al.*, 2002:73). In the state of Michigan natural amenities around the Great Lakes region exerted upward pressure on agricultural prices for outdoor activities such as fishing, hunting and residential homes (Wittenberg *et al.*, 2005:17). In Canada differences in farm prices from two states could not be explained exclusively by valuation fundamentals such as sustained earnings and return on investment, but economic activity and cultural differences also played a role (Painter, 2004:112-113, 117).

This multi-functional transition results in increased uncertainty with rural land valuations, as motivations are diverse and not well understood (Deller *et al.*, 2005:131; Healy and Short, 1978:185, 198; Prag, 1995a:1-12).

2.3 The fundamentals of valuation theory

2.3.1 Market sales comparison method of value estimation

There are numerous methods available for the valuation of real estate, but three are relevant for the valuation of farms and buildings on farms, namely the income capitalisation method, inventory or cost method and market sales comparison method (American Institute of Real Estate Appraisers, 1992:313, 367, 409; Fisher and Martin, 1995:28-29; Gaddy and Hart, 1996:186-192; Grissom and Crocker, 1994:95; Harwood and Jacobus, 2000:346-358; The South African Property Education Trust, 2004:30-35).

The income capitalisation method is based on the premise that there is a relationship between a property's earnings capacity and the property's value (The South African Property Education Trust, 2004:33-35). A property's value is determined by looking at the net annual income (investment return) it is expected to produce: the income stream of a property is capitalised into a present value. The method requires income and cost predications, as well as the choice of a capitalisation rate (American Institute of Real Estate Appraisers, 1987:408; 1992:409; Ellenberger, 2007:9-11; Gaddy and Hart, 1996:192; Jonker, 1984:89-90; Ling and Archer, 2005:217-218; Ventolo and Williams, 1990:161, 187).

Although this method is inadequate for farm valuations where non-agricultural factors are dominant (where the role of income from production is minimal), and criticism has been forwarded regarding

the difficulty of separating the influence of individual management practices from income levels of agricultural properties, the income capitalisation method has its place within the valuation realm (Behrmann, 1995:25). It is still commonly used in the valuation of income-generating components of farming businesses, such as guest houses and restaurants (Guiling *et al.*, 2007:4). It has also been proposed as at least a supplementary method to determine the value of rural properties that are profit based (agricultural production for income purposes), as is the case with other income-producing properties such as commercial and industrial sectors, as well as leisure, tourism and businesses properties (Eves, 2005:620-621). Conversely, the use of the income approach to reflect the level of management could be beneficial by providing additional information regarding risk and appropriate capitalisation rates to be used (Eves, 2005:621, 630).

The foundation for the cost method is substitution – the cost of erecting a new building is estimated and then substituted for the current building, adjusted for depreciation (American Institute of Real Estate Appraisers, 1987:345, 351; 1992:313; The South African Property Education Trust, 2004:32; Ventolo and Williams, 1990:123). The cost can be either that of reproduction, where the cost of erecting an identical building is determined, or that of replacement, where the cost of constructing a building with the same function is projected. The estimated market value of the site as if vacant (determined by the market sales comparison method discussed below) is then added to the depreciated cost of the improvements with the formula depicted below.

$$\text{Market value} = \text{Reproduction/} - \text{Depreciation} + \text{Site value}$$

replacement cost of
improvements

(Ventolo and Williams, 1990:123)

This method is useful in the estimation of the value of new or almost new improvements (American Institute of Real Estate Appraisers, 1987:71). For instance, the value of recently developed permanent plantings (e.g. vineyards, orchards) should be reflective of land preparation and past care costs (The South African Property Education Trust, 2004:32). The problem with this method is that cost cannot be assumed to be a proxy for value, and the sum of the values of each component of the farm usually does not add up to its total value, because of reasons such as a strong demand for unimproved land or obsolete buildings, where improvements were made based on wants and not needs (Behrmann, 1995:32).

The market sales comparison method is universally accepted as the most appropriate method to determine the market value of properties, because it reflects actual market behaviour (Boykin and Ring, 1993:146; Ellenberger, 1983:85-85; Jonker, 1984:79; The South African Property Education Trust, 2004:35) and incorporates influences of both sides of the market (buyers and sellers) (Bounds, 1982:436). It is based on the principle that a buyer will not pay more for a specific property than the price (which is a proxy for value) for which he can obtain a comparable substitute property that will fulfill the same objective (American Institute of Real Estate Appraisers, 1987:312; 1992:367; Boykin, 2001:73; Ellenberger, 2007:7-1; Sando, 1973:222; The South African Property Education Trust, 2004:30-32, 35; Vandell, 1982:256).

The concepts of HBU and market value form the basis of the market sales comparison method. Valuers must first and foremost decide on the HBU of the subject property, which gives them direction as to which properties to use as reasonable comparables for evidence of market value (Ellenberger, 2007:7-1). The decision of a particular HBU for the subject property is based on its characteristics (Reynolds and Regalato, 2002:182). It implies a selection of certain value-bearing attributes of the property as perceived by the “typical buyer” (an imaginary construct in the buyer’s head). The typical buyer assists the valuer in his/her decision of the HBU (Ling and Archer, 2005:190). The subject property is then compared with properties with a similar HBU recently sold in the area and adjustments are made to correct for differences between them (Gaddy and Hart, 1996:186; Ling and Archer, 2005:195; Ventolo and Williams, 1990:77).

The following section looks at the building blocks of the market sales comparison method, namely market value and HBU, and problems associated with their use.

2.3.2 Value and market value

Value exists in people’s minds (Ellenberger, 2007:6-3). To have value, an object must possess certain general traits: there must be a demand for the item (e.g. property) because it fulfills a need and be useful by providing satisfaction/utility to a person, while it must be scarce but transferable (ownership must be possible). Something that has value has specific characteristics that are desired by people in order to satisfy their needs and wants (Boykin and Ring, 1993:3; Whipple, 1962:183).

There are many types of value, for example economic value, real value, depreciated value, cash value, consumptive value, direct value and so the list continues (Blignaut and De Wit, 2004:55 - 57;

Boykin and Ring, 1993:9; Jonker, 1984:3; Lloyd, 1949:306). The different meanings of the word 'value' imply that an object can have different values for different people. As such, value is subjective and open to different interpretations. The potential of agricultural land to deliver products and services that satisfy human needs and wants implies that agricultural land has utility and value (Burger, 1990:74; Lombard, 1993:74).

The value of land stems from its use, and this is referred to as value-in-use (American Institute of Real Estate Appraisers, 1987:20; Ellenberger, 1983:73; Jonker, 1984:5). Land can only have value when it is used, hence the focus on the HBU of a property to determine its value (Huck, 1965:190-191; Mundy and Kinnard, 1998:213; Reynolds and Regalato, 2002:82). Market value, however, is not seen as value-in-use, because it cannot be traded, as people have different uses for the same property, and they obtain different utilities from it. Instead, market value relates to a property's value-in-exchange, which is a temporary monetary value for which the property can be exchanged (i.e. the price of the property). Value-in-use relates to a specific use which is subjectively determined, while value-in-exchange refers to the monetary value of a number of properties with a similar use transacted in the open market and is perceived as an objective measurement of market value (Jonker, 1984:6). It follows that while the value of properties is subjectively determined by buyers and sellers (Boykin and Ring, 1993:4-6; Ellenberger, 1983:74; 2007:7-1; Lombard, 1993:79), valuers must study the facts relating to property transactions and prices reached in the open market (competitive forces) to perform an objective analysis of market prices (American Institute of Real Estate Appraisers, 1992:275).

Property valuations are primarily concerned with market value and it lies within a valuer's expertise to estimate the market value of properties, based on the prices of comparable properties sold in the open market (Boykin and Ring, 1993:9; Jonker, 1984:3). This estimation is an opinion of market value, based on the analysis of market information (Ellenberger, 2007:6-3; Ratcliff, 1975:485; Whipple, 1962:182). The HBU of a property assists valuers in their analysis and determination of a property's market value. These concepts are described below.

There are many definitions of market value (Grissom and Crocker, 1994:94). Earlier definitions concentrated on market value as the *highest* price which a property could sell for in the open market, while later definitions instead focused on the *most probable price* of such a property. The Valuers' Manual describes market value as the amount a willing buyer would be likely to pay a willing seller in the open market (Ellenberger, 2007:7-3), while the American Institute of Real Estate Appraisers defines it as the most probable price in cash (or cash equivalent) that a property

would be sold for in a competitive market under conditions constituting a fair sale, when both buyer and seller are not under pressure and acting in a competent manner (American Institute of Real Estate Appraisers, 1987:19).

Some conditions need to be present for a sale to be accepted as one reflective of market value. Market value can only be determined from transactions where neither the buyer nor seller was under pressure to undertake the sale and where they could negotiate on equal terms, thus a “fair” sale with reasonable exposure in the open market where cash or an equivalent must be paid (American Institute of Real Estate Appraisers, 1987:17-18; Appraisal Institute, 2002:177-178; Boykin and Ring, 1993:20). Only arms’ length transactions are included (*bona fide*), in other words transactions where the sales price cannot be influenced by personal relations or special interests between the buyer and seller, while both parties are assumed to act knowledgeably and be well informed (Ellenberger, 2007:7-1-7-4; Jonker, 1984:22 - 26). For this reason traditional valuation theory is grounded within the neo-classical economic theory of perfect competition (Jonker, 1984:26).

Market value is estimated through analysis of market behaviour and the willing buyer and seller are hypothetical constructs in the valuer’s mind (correlating to the “typical” buyer and seller) which assist valuers in deriving this value (Jonker, 1984:13, 19). A property can have only one value at a specific point in time (Holstein, 2003:37). This matches the Law of One Price (LOOP) used in theories of international trade. This law states that the price level of identical goods should converge across countries if expressed in the same currency and after transport costs have been excluded, because of arbitrage (Chen and Lee, 2008:123; Goodwin *et al.*, 1990:682). However, the LOOP only holds for homogeneous goods, although no two parcels of land can ever be identical (Spren *et al.*, 2007:408).

2.3.3 Highest and best use (HBU)

A property’s value lies in its use and owners derive benefits from the use of their properties (Huck, 1965:190; Mundy and Kinnard, 1998:213). Valuers need to establish the use and nature of these benefits (monetary/income or non-monetary based) in order to conduct valuations. The use envisaged for a property determines its value, which, in turn, is influenced by the characteristics of the property (Ellenberger, 1983:29; 2007:7-7; Reynolds and Regalato, 2002:82; Smith, 2004:42). Valuers base their valuations on the HBU they envision for a property. The decision on the HBU is

critical. It guides the valuer through the valuation process by identifying a specific use for a property. This provides direction on the choice of comparable properties, which are based on properties with similar uses that provide similar benefits to include in value comparisons (Lennhoff and Parli, 2004:45; Roberson, 1997:118; Sando, 1973:222). For this reason the HBU represents the essence of a valuation. Use determines value and HBU determines market value.

The following conditions need to be present for a use to be regarded as the HBU of a property: it must be legal, physically possible, financially viable and maximally productive (Abson, 1989:2; American Institute of Real Estate Appraisers, 1987:42; Rabianski, 2007:40).

Like the definition of market value, the definition of HBU has also been subjected to various revisions and criticism (Grissom and Crocker, 1994:86; Wolverson, 2004:318). Over the years the emphasis of HBU has shifted from being the use that provides the largest net income over a period of time, to the use that results in the highest land value. In general the HBU is defined as that use of vacant land or an improved property that is reasonably likely and legal and is physically, legally and financially possible, which can be properly supported and results in the highest land value (American Institute of Real Estate Appraisers, 1987:42; Lennhoff and Elgie, 1995:275; Lennhoff and Parli, 2004:46; Thair, 1988:190-191). The concept also has its roots in traditional classical economics, where humans are perceived as rational economic beings who attempt to maximise their utility or income (Grissom, 1983:50).

2.3.4 Problems associated with market value and HBU

The many definitions of market value are indicative of the struggle valuers experience in understanding its compound character. (See Table 2 for an overview of literature with various definitions of market value).

Table 2: Summary of definitions of market value as depicted in valuation literature

Author	Definition of market value	Contribution
American Institute of Real Estate Appraisers (1950) in: Albritton (1980:200)	As defined by courts, market value is the highest price estimated in terms of money which a property will bring if exposed for sale in the open market allowing reasonable time to find a purchaser who buys with knowledge of all uses to which it is adapted and for which it is capable of being used.	<ul style="list-style-type: none"> • Market value as highest price
Ratcliff (1972:527)	Market value is most probable selling price.	<ul style="list-style-type: none"> • Value is uncertain, not a measurement • Estimate, or range • Objective, determined by market
Albritton (1979:452)	The most probable price a property would be likely bring in the marketplace on the appraisal date, presuming all other qualifications of an arms' length, open-market transaction without special need or compulsion by either party.	<ul style="list-style-type: none"> • Market value is not highest, but most likely price, which is more realistic
Colwell (1979:54)	The expected selling price under all conditions requisite to a fair sale (market value is the most probable price of a distribution of potential selling prices.	<ul style="list-style-type: none"> • Different definitions give different estimates of market value • Role of mean, mode, median
Albritton (1980:205)	Market value is the estimated price, in terms of money, which a property should bring in a competitive and open market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently and knowledgeably and presuming the price is not affected by undue influence.	<ul style="list-style-type: none"> • Comprehensive • Practical, logical, usable • Most likely, most probable, most reasonable price • Most probable price at HBU, fair value instead of highest value
American Institute of Real Estate Appraisers and Society of Real Estate Appraisers (Real estate appraisal terminology) (1981) in: Smith (1986:5)	The most probable price in terms of money which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently, knowledgeably, and assuming the price is not affected by undue stimulus.	<ul style="list-style-type: none"> • Provide detail description of prevailing market conditions • Subject property and comparative transactions must be comparable
Miles (1980:543)	The appraiser's value estimate is not the highest price the property could bring as suggested by the common definition of market value, but the most probable selling price of the property.	<ul style="list-style-type: none"> • Reflect on error and risk in value estimates
Vandell (1982:266)	Market value not single descriptive characteristic of random variable, need distribution of selling prices.	<ul style="list-style-type: none"> • Need overall sales price probability distribution with use of mean, mode and median • Reflect uncertainty
Grissom (1985:224)	The value definition is the combination of the value theory and the emphasis of the value premise with the integration of policy and decision constraints.	<ul style="list-style-type: none"> • Value definition acts as appraisal hypothesis • Need to look wider at value premise • Value definition links problem and decision
Reenstierna, (1985:115-116)	Probability of selling price in terms of graphs and range of possible selling prices.	<ul style="list-style-type: none"> • Objective estimates • Provides more information, uncertainty dealt with in terms of probability and range
American Institute of Real Estate Appraisers (1987:19)	The most probable price, as of a specified date, in cash, or in terms of equivalent to cash, or other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, assuming that neither is under undue duress	<ul style="list-style-type: none"> • Statistical definition for market value as the MPP standardise its meaning and provides more information that could lead to deeper insight into factors affecting value

Table 2: (continued)

Author	Definition of market value	Contribution
Hill (1990:234)	Market value determined by analysing historical sales and future demand; interpret most likely active market for buyers (need to understand buyers).	<ul style="list-style-type: none"> • Critical to understand buyers' motivations
Whipple (1990:21-22)	Market value is the most probable price that a willing buyer would pay a willing seller after a reasonable time period.	<ul style="list-style-type: none"> • Avoid normative definitions, because they are inconsistent
Ventolo and Williams (1990:4)	The most probable price real estate should bring in a sale occurring under normal market conditions.	<ul style="list-style-type: none"> • Emphasise most probable price as market value
Fraser (1991:35-36)	Market value is the most probable price at the most probable use.	<ul style="list-style-type: none"> • Based on reality, actions, where suboptimal decisions are made (value less than maximum) • Flexible • Recognises market uncertainty, which makes estimate of value more credible
Hunt (1991:303)(Hunt, 1991)	A price within an acceptable range at which an owner and an assumed purchaser would come together on the stated date in the current market conditions after the reasonable exposure for the particular market and being neither a special nor a forced sale value.	<ul style="list-style-type: none"> • Reflect reality that buyers, sellers seldom willing
Britton, Davies, Johnson (1980) in Boyd (1992:87)	Value is not intrinsic but results from estimates, made subjectively by able and willing purchasers, of the benefit or satisfaction they will derive from ownership of the interest. The valuer must be able to assess the probable estimates of benefit of potential purchasers.	<ul style="list-style-type: none"> • Value depends on utility derived by potential buyer
(McNamara, 1992:171)	Market value is the estimated amount for which an asset should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction, after proper marketing, wherein the parties had each acted knowledgeably, prudently and without compulsion.	<ul style="list-style-type: none"> • Common approach for consistency
Boyd (1992:87)	Market value is the most probable price likely to be agreed between buyer and seller at the time of valuation.	<ul style="list-style-type: none"> • Admit that market value cannot be described in absolute terms • Actual market conditions included (as opposed to normal value)
Appraisal Institute (2002:177-178)	A type of value, stated as an opinion that presumes the transfer of a property, as of a certain date, under specific conditions set forth in the definition of the term identified by the appraiser as applicable in an appraisal.	<ul style="list-style-type: none"> • Market value is a well informed opinion of valuers
Kummerow (2002:408)	Propose statistical definition with: central tendency estimates (sale price distributions), distribution spread measures (risk, errors), forecasts, deeper insight into factors affecting value.	<ul style="list-style-type: none"> • Avoids ambiguity of valuation definitions through statistical definitions • Focus attention on variability and risk • Allows probability statements and admit that value is random variable • Add estimates of dispersion of sale price distribution in addition to central tendency measures • Simple, unambiguous way to report uncertainty and valuer's own mistakes in reading market
Ellenberger (2007)	Market value is the amount a willing buyer would be likely to pay a willing seller in the open market.	<ul style="list-style-type: none"> • Simple definition that focuses on market value as the likely (probable) price

The term market value was constructed to capture the many aspects involved in the formation of value in a heterogeneous land market in order to standardise valuation practice and to provide a clear yet comprehensive definition that would act as a guideline to valuers (Jonker, 1984:73). Most problems arise from the neo-classical assumptions that market value operates within a perfectly competitive environment and has a normative nature (Boyd, 1990:103; 1992:87; Connolly, 1993:485; Fraser, 1991:35; Kummerow, 2002:407; Miles, 1980:540; Ratcliff, 1972a:523; Taeuber, 1956:25; Vandell, 1982:257-258; 1988:344-345). Continued criticism led to efforts to create more user-friendly definitions, but instead of supporting the valuation process, definitions ended up being highly hypothetical, theoretical, impractical and unrealistic (Dotzour *et al.*, 1990:17; Lennhoff and Parli, 2004:45).

The theoretical assumptions of perfect competition and complete information, underpinned by rational human thought, erode the base of traditional market value theory. These assumptions are not reflective of human behaviour and actual events (Campbell, 1969:631; Fraser, 1991:35; Grissom, 1983:50-51; Ratcliff, 1972b; 1975:486; Reenstierna, 1985:116). There are seldom many similar transactions from which market value can easily be calculated, the thought processes of buyers and sellers cannot simply be replicated and limited knowledge makes it difficult for involved parties to make well informed decisions and increase uncertainty associated with the estimation of market value (Fraser, 1991:37; Kummerow, 2002:407-408).

Preference for a normative approach which emphasised what market prices should be, instead of what market prices actually are in a realistic, imperfect market (positive approach) serves to strengthen the notion that there is one “true” value for a property (Collins, 1965:541-542; Ross, 1969:952). It creates the perception that market value can accurately and confidently be determined without any uncertainty or market imperfections. It does not capture the reality associated with market value, which is a complex exercise where the price paid for a property is just one of many elements that need to be analysed (Grissom, 1985:218). In addition, valuation is a social science: it is economics applied to land and focuses on real human behaviour and decision making, which can by no means claim to be an exact science. The determination of a single price as market value as the sole purpose of valuation practices is stressed at the expense of the function of valuations (Grissom, 1983:51), which is to provide more information and derive a market value based on actual market research, where market value is a product of many intricate factors and thought processes (Albritton, 1979:406; Dotzour *et al.*, 1990:18; Huck, 1965:196; Lennhoff and Elgie, 1995:276-277; Lennhoff and Parli, 2004:48; Ratcliff, 1975:485-490; Rattermann, 2008:23-24; Thair, 1988:193; Vandell, 1982:257; Webb, 1980:58).

It is hardly surprising that the definition of HBU has also been subject to much criticism from within valuation circles, even though definitions are constructed with the best of intentions. It suffers the same fate as that experienced with the term market value in that it is theoretical, which makes it difficult to understand and apply in practice (Huck, 1965:196). The concept has been criticised as being poorly constructed, outmoded, confusing, vague and contradictory (Lennhoff, 2004:48; Thair, 1988:193; Vandell, 1982:257) and it has been redefined numerous times (Dotzour *et al.*, 1990:23; Wilson, 1995:87).

Traditionally HBU was defined as that available use or future use of a piece of land which produces the highest present land value. HBU was seen in a theoretical sense as the most profitable or optimum use of a property in terms of income, which was to a large extent determined by valuers' own judgment and experience (American Institute of Real Estate Appraisers, 1987; Boykin and Ring, 1993:45; Webb, 1980:57-58). The definition was consequently changed to the most profitable likely use or future use that is legally, physically and financially possible and produces the highest land value (Ellenberger, 1983:74), while uses not legal at the time, but possible in future, should also be considered (Grissom, 1983:51). For this reason HBU became synonymous with an ultimate, maximum, or perfect use. However, basing a valuation on a single maximisation criterion is an oversimplification of reality that does not resemble the actual decision making process of people and is unlikely to occur in reality (Whipple, 1962:181-183). A summary of the various definitions of HBU forwarded in the literature is provided in Table 3.

Table 3: Summary of definitions of HBU as depicted in valuation literature

Author	Definition of HBU	Contribution
(Babcock, 1932)	That available use and programme for future utilisation of a parcel of land that produces the highest land value.	<ul style="list-style-type: none"> • HBU is use that results in highest land value
Whipple (1962:181)	If a development achieves maximum acceptability in the market, then the site has been put to its highest and best use.	<ul style="list-style-type: none"> • Highest and best use is not maximum legal use • HBU influenced by: economic, legislative, sociological factors
American Institute of Real Estate Appraisers (1962) in Huck (1965:193)	The most profitable likely use to which a property can be put.	<ul style="list-style-type: none"> • Emphasis on profitability and highest income
Huck (1965:196)	The appropriate use for market value appraisals is the most probable use or the most practical use.	<ul style="list-style-type: none"> • Use that yields highest income and use which provides highest value not necessarily the same • Reduce confusion, contradiction Look at different views, e.g. social, aesthetic, moral • Look at land and buildings as unit
Kinnard (1966) in Grissom (1983:45)	HBU is the most probable use (MPU).	<ul style="list-style-type: none"> • “Satisficing” play role: decision does not always reflect optimum return, could base decision on non-economic factors
Ratcliff (1972:524-525)	HBU is MPU and founded on how real people arrive at decisions, rather than the assumption of a single maximisation test.	<ul style="list-style-type: none"> • HBU more realistic • Reflect actual human behaviour, prediction under uncertainty • Probabilities
(McDiarmid, 1975:444)	That legal and reasonable use which will produce the greatest returns and/ or benefits over a period of time.	<ul style="list-style-type: none"> • Simple definition • Determine current HBU, nothing else
Graaskamp (1977) in Thair (1988:195)	The most probable use is something less than the most fitting use (MFU).	<ul style="list-style-type: none"> • MPU does not equal most fitting use • MFU is a long-term optimal use • Distinguishes between MFU and MPU
Kinnard and Boyce (1978) in Webb (1980:57)	HBU is highest and most profitable use, optimum use that is reasonable and probable use which will support highest present value.	<ul style="list-style-type: none"> • Probable use, but emphasis still on highest present value
Albritton (1979:406)	HBU is the logical, legal, and most probable use that will produce the highest net return to the investor over a sustained period of time. It is that available use or program of probable future utilisation that produces the highest present land value.	<ul style="list-style-type: none"> • All economic principles analysed carefully
Kinnard and Boyce (1978:4-13) in Webb (1980:57)	Highest and most profitable use is that reasonable and probable use which will support the highest present value as defined, as of the effective date of the appraisal.	<ul style="list-style-type: none"> • HBU synonymous with most profitable use
Webb (1980:58)	HBU is use that produces highest land value or most profitable use.	<ul style="list-style-type: none"> • Make concept of risk more explicit through discount rate • HBU as highest land value or most profitable use at same time can be confusing • Need to decide whether HBU is: MPU, use that produces highest land value or use that yields highest profit

Table 3: (continued)

Author	Definition of HBU	Contribution
Vandell (1982:268)	Definition of HBU: need probability distribution of each potential use/ user combination.	<ul style="list-style-type: none"> • Reflect uncertainty • Market value and HBU defined analytically by linking to mathematical methodology (mean, mode, median) • Mode – not representative of distribution • Median – not representative of distribution, good for outliers • Maximum – not realistic • Mean – representative of distribution, minimises sampling error
American Institute of Real Estate Appraisers (1967) in Grissom (1983:46)	The use of land which may reasonably be expected to produce the greatest net return to land over a given time period – that legal use which will yield to land the highest present value, sometimes called optimum use.	<ul style="list-style-type: none"> • Optimum use
Grissom (1983:56-57)	Distinguishes between HBU, MPU, MFU.	<ul style="list-style-type: none"> • Clearer meaning for better use
American Institute of Real Estate Appraisers (1987:42, 2001)	The reasonably probable and legal use of vacant land or an improved property, which is physically possible, appropriately supported, financially feasible, and results in the highest value.	<ul style="list-style-type: none"> • Highest land value
Thair (1988:195)	Rather use MPU as the most probable use among alternatives.	<ul style="list-style-type: none"> • Realistic • Can better look at things such as: special purpose property, multiple-use property, interim use property
Abson (1989:1)	HBU is MPU.	<ul style="list-style-type: none"> • If HBU differs from MPU, it is because MPU is not maximum use and is based on a probably basis, where HBU is based on maximum return
Ventolo and Williams (1990:6-7)	It is its most profitable legally and physically permitted use, that is, the use that will provide the highest present value.	<ul style="list-style-type: none"> • HBU is most profitable use
Dotzour et al (1990:24)	HBU represents a constraint optimisation problem where the appraiser attempts to identify the optimal combination of physical, legal, locational and capital attributes that maximise the wealth of the owner.	<ul style="list-style-type: none"> • Contemporary view • HBU can be quantitatively determined • Analytical consistency • Formalised model • Enhances market efficiency and optimal allocation
Wilson (1995:87)	The probable use on which an estimate of market value is based.	
Lenhoff and Elgie (1995:275) and Finch and Casavant (1996:195-196, 98)	The reasonable probable and legal use of vacant land or an improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value (The Dictionary of Real Estate Appraisal definition).	<ul style="list-style-type: none"> • Look at timing of use and type of user • Identify what typical buyers and seller use to decide on price • Integrate concepts of HBU, special purpose properties, contribution and value in use, as well as multiple uses
Roberson (1997:113)	Market value must consider all uses for which it is suitable.	<ul style="list-style-type: none"> • HBU reflect all aspects of value, including non-economic

Table 3: (continued)

Author	Definition of HBU	Contribution
Mundy and Kinnard (1998:214)	HBU expanded to include non-economic use as well: HBU is market-driven concept where evidence in form of transactions is used to determine most profitable use.	<ul style="list-style-type: none"> • Transactions are best measure of value, not whether use is economic, non-economic
Wolverton (2004:323)	The reasonable probable and legal use of vacant land or an improved property, which is physically possible, appropriately supported, financially feasible, and that results in the highest value.	<ul style="list-style-type: none"> • Definition of HBU grounded in von Thunen's land rent theory which provides logical construct for financially feasible use and shows why maximally productive use must prevail at a site (creates more purchasing power)
Lenhoff and Parli (2004:48)	The probable use of land or improved property – specific with respect to user and timing of use – that is adequately supported and results in the highest present value.	<ul style="list-style-type: none"> • Clear, concise, universally applicable • Bring in timing of use and most likely user • Replace reasonably probable and legally possible with probable use
Rabianski (2007:44)	HBU of vacant land (improved property) is the most financially feasible use from all uses supported by freely competitive and (legally and physically) unobstructed current and future property market conditions generating the highest present value (financial return) to the land.	<ul style="list-style-type: none"> • Probable use replaced with current or future use • Accompanied by matrix • Issues of use and timing dealt with • All options (legal and illegal) investigated
Ellenberger (2007)	The optimum likely use to which land can be most advantageously exploited within the confines of all the restrictions imposed upon its use by law, due regards being had to the responsibility of their modification or removal, is referred to as its highest and best use.	<ul style="list-style-type: none"> • Likely use emphasised, but within confines of it being an optimum use

The statement that the HBU is the most profitable use or the use that produces the highest land value could be contradictory, as they are not necessarily the same (Huck, 1965:195; Webb, 1980:58). Profit relates to the income generating capacity of the land (production oriented), while satisfaction relates to the use or enjoyment derived from a property (Huck, 1965:191). This gives the definition of HBU a binary approach where both the highest income and/or highest satisfaction could be investigated (Thair, 1988:198). Involved parties have many motivations for buying agricultural land, which can range from wanting to maximise profit to wanting to maximise satisfaction, which is a less tangible non-economic use (Adams and Mundy, 1991:41; Pope, 1985:81, 85; Thair, 1988:191). However, each different use has a specific set of value attributes related to it. Valuation of a property from each of these angles would result in different values (productive or consumptive) and valuers would need to establish the comparable features of each (but valuation theory dictates that a property can have only one market value at a specific point in time).

These decisions are complex and subjective, and are often not made by relying on a single maximisation criterion based on economic considerations alone, as HBU suggests. The use decision comes about as an interaction of many factors, of which profit makes out only one part (Dotzour *et al.*, 1990:27, 29). This leads to greater uncertainty in the decision of the HBU (Whipple, 1962:183-184).

The problems experienced with the determination of market value and HBU led to the increased use of mathematical and econometric models to facilitate order and logical decision making procedures. This contemporary approach views the HBU as a constrained optimisation problem where an optimal mix of physical, capital, locational and legal attributes of a property need to be determined to maximise income and price (Canonne and MacDonald, 2003:115-116, 119; Dotzour *et al.*, 1990:27; Wilson, 1995:87, 90). These models, however, can lull valuers into a false sense of security backed up by numbers, without a deeper understanding of the real working of market forces. Mathematical and computerised models can and do assist valuers in the determination of HBU and market value, but cannot replace the human element, which relies on complex, interrelated sociological fundamentals (Fraser, 1991:25-26; Kummerow, 2002:407).

Court room attempts to clarify the meaning of market value and HBU in many cases perpetuated existing problems as judgments were reserved under non-market conditions and favoured normative outcomes resembling conditions of perfect competition. This forced the valuation profession into a theoretical and normative mould based on non-market conditions (Grissom, 1983:53; Thair, 1988:191).

Other concepts have been forwarded to clarify the meaning of HBU, ranging from most fitting use, describing a theoretical long-term highest and best use, to most profitable use, most logical use (Crouch, 1966:167), optimum use (Huck, 1965:191), most practical use (Grissom, 1983:54 - 55) and most probable use of a property (Canonne and MacDonald, 2003:119; Grissom and Crocker, 1994). (See Grissom, 1983:56-57 for a summary of these concepts).

2.3.5 Most Probable Price and Most Probable Use

Traditional valuation theory perceives value as being linear over time with no short term fluctuations. At the same time the market value definition depicts people as rational beings who make optimal decisions and it assumes a perfect market from which a single point estimate of value

could easily and accurately be determined (Fraser, 1991:37; Reenstierna, 1985:126). This is an unlikely, theoretical and unrealistic assumption: people do make sub-optimal decisions.

Valuations must reflect actual human behaviour: it is concerned with real decision making, even if these decisions are erroneous or imprecise (Boyd, 1990:103; 1992:86, 89; Fraser, 1991:37; Kummerow, 2002:407-408; Miles, 1980:540-542; Ratcliff, 1972a:527; Reenstierna, 1985:123; Whipple, 1990:18-19). For this reason it was proposed in the 1960's that the term market value be replaced with the concept most probable selling price (MPP) (Babe, 1969:637; Grissom and Crocker, 1994:94; Miles, 1980:540). The market value of a property would then be the most probable selling price in the market, instead of the highest price that can be achieved (Grissom, 1983:50, 55). The MPP focuses on the short term, while market value relates to the longer term (Grissom and Crocker, 1994:94). The most probable selling price was perceived to be a better reflection of the reality that decision making was based on limited information and that the prediction of a future hypothetical transaction price could not be accurately estimated, but only expressed in terms of a range and probabilities (Reenstierna, 1985:126).

In a similar fashion, the term HBU could be replaced by the term Most Probable Use (MPU), which represents the most likely use among alternatives. HBU focuses on the maximum and optimum use, while MPU looks at most likely use within a range of possible uses (Grissom and Crocker, 1994:86), which will not necessarily be the optimal or maximum use, because people do not have perfect information of the land market (Roberson, 1997:116-117; Thair, 1988:195). The MPU implies the existence of alternative uses with different markets and probable buyers, thereby creating room for multiple and diverging perspectives regarding the best use of a property and thereby also acknowledging the uncertainty surrounding the choice of a single "best" use in valuations (Grissom and Crocker, 1994:87). It reflects human behaviour which could be sub-optimal (as opposed to maximal) and provides flexibility in valuations by stressing that the use of a property is determined by a range of factors, including non-economic ones, that complicates decision making(Thair, 1988:196).

The MPU can accommodate multiple uses by treating each use as a separate valuation "stream", until a decision on the use with the highest possibility of being realised is made (Thair, 1988:190, 192). It also allows for the valuation of special purpose properties, which sometimes need to be analysed on the basis of two highest and best uses, such as the continuation of the existing HBU and the conversion to an alternative HBU (American Institute of Real Estate Appraisers, 1992:293). In this way more information is provided on different uses and special cases such as multi-purpose and

interim-use properties. Thus MPU covers more than HBU, but with a simpler definition (Bounds, 1982:436; Huck, 1965:193).

MPU does not assume that the use that yields the highest income is necessarily the use that yields the greatest value. It focuses on the highest land value to be realised in money or amenity terms and emphasises the most likely and possible use for the most probable buyer (Grissom, 1983:52; Kummerow, 2002:407; Thair, 1988:191).

The most important contribution of the MPP and MPU is their recognition of uncertainty surrounding the choice of a single land use and value (Boyd, 1992:87; Whipple, 1990:17, 24) that stems from the complex nature of valuations with interaction of market forces, diverse buyer preferences based on subjective utility functions, different uses and lack of reliable data (Ratcliff, 1972a:526 - 527); (Jonker, 1984:14). In contrast to the traditional definition of market value that suggests that there is one “true” value that could be determined as a point estimate, the MPP and MPU admit that more than one price and use is possible, but that a valuer is estimating the use and price that would *most likely* be attained in the open market (Colwell, 1979:54; Ratcliff, 1975:486; Reenstierna, 1985:116; Smith, 1995; Thair, 1988:192).

The words “most probable” have a statistical dimension, implying that statistical measures could be used to assist in valuation analysis (Miles, 1980:540-541; Prag, 1995a; 1995b; Reenstierna, 1985:119; Thair, 1988:199; Vandell, 1982:259-260). With the MPP, market value signifies the most probable selling price within a distribution of potential selling prices, while the MPU is that use that is most likely to be realised among a distribution of potential uses. Statistics deal with uncertainty, measures of central tendency, standard deviations, errors, interval estimates, ranges, risk and probabilities.

Although market value is provided as a single point estimate in valuation reports, it is actually a random variable that is part of a distribution of selling prices. Point estimates are difficult to calculate and the use of one descriptive for a random variable does not provide insight to enhance decision making (Bounds, 1982:435; Boyd, 1990:102; Kummerow, 2002:410; Reenstierna, 1985:126). The use of the MPP and MPU allows valuers to provide a range of possible values and uses to demonstrate the complexity associated with valuations (Boyd, 1990:102-103; 1992:88). A range allows for uncertainty, while acknowledging risk (Boyd, 1990:102-103; Miles, 1980:541; Reenstierna, 1985:125-126; Reynolds, 1995:85). The likelihood of specific prices/uses within the range being realised (probability) would also provide clients of valuation reports with better

information by providing an indication of the accuracy of prices (Kummerow, 2002:410; Miles, 1980:540). Different clients are interested in different estimates, e.g. a seller might want to know what the highest selling price could be, while a lending institution needs to know the risk profile associated with a specific price for a property. Valuers could use interval estimates that show the range and degree of precision according to a specified confidence interval level (for example that there is a 90 percent chance that the market value falls within a specified range) (Colwell, 1979:54, 58; Miles, 1980:540).

A range of values could statistically be equated to a distribution of potential selling prices, which implies the use of measures of central tendency, such as the mean, mode and modus. The mean relates to the expected price, the mode correlates with the most probable price and the median is the middle price (50 percent probability that the value is higher or lower than this price) (Colwell, 1979:58).

If a normal distribution is assumed, the traditional point estimate value in valuation reports corresponds to the mean of a distribution (Miles, 1980:542). It is viewed by some as the best reflector of market value as it represents the total distribution of selling prices and thus would be the most statistically correct to use for valuation purposes (Smith, 1995:82). Normal distributions are rare in real estate, however, and the use of averages goes against the grain of using judgment to adjust comparative sales data (Reynolds, 1995:84). Others argue that it is a misleading and unreliable figure to use because of its susceptibility to outliers (Colwell, 1979:54; Prag, 1995a:3; 1995b:10; Reenstierna, 1985:116; Vandell, 1982:268), its inability to provide detail about a specific property as individuality is surrendered in return for a single figure (Colwell, 1979:54) and the difficulty in dealing with the time factor of sales and properties' heterogeneous character (Reynolds, 1995:83).

The mode and median keep their individuality within a distribution. The mode represents the most probable price and corresponds with the most probable use of a property (MPU) (Vandell, 1982:268), while the median gives a reflection of the 50 percent mark of a distribution. The maximum price has in actual fact very little chance of being realised (Schultz, 2007:136-137; Vandell, 1982:256).

The mean, mode and median all have their advantages and disadvantages. The concern is not to determine which measure is best, but rather to state the overall distribution and present these descriptors to provide additional information and a different angle of market value to clients of

valuation reports (Schultz, 2007:137). If the market value of a property is to correspond to its HBU, valuers have to choose the maximum price, but HBU suffers from the same problems and inadequacies as market value and is highly theoretical, meaning that the chance of the maximum price being released is not realistic. If the definition of HBU is taken as the expected use of a property, then the mean price can be used, and if the HBU is assumed to be the most probable use, the mode as most likely price can be used (greatest possibility of happening). If there are many outliers towards the higher end of sale prices, it is sensible to use the median, rather than the mean to make comparisons (Colwell, 1979:54). Even though statistical analysis provides essential and additional information in valuations, it is important also to focus on human behaviour and to include buyer, seller and property characteristics as well (Reenstierna, 1985:118).

Statistics do not provide a quick solution for all valuation problems. Large samples are needed to allow for valuations based on confidence intervals (Colwell, 1979:54; Holstein, 2003:37; Reynolds, 1995:85; Smith, 1995:82). In reality, however, sales data are limited and often insufficient to draw meaningful statistical conclusions (Reynolds, 1995:83). In addition, sales data are seldom normally distributed and distribution measures cannot be used (Isakson, 2001:428; Reenstierna, 1985:124; Reynolds, 1995:83; The South African Property Education Trust, 2004:91). At the same time, the transactions involving special cases are difficult to include in statistical inference (Kummerow, 2002:411; Reenstierna, 1985:125). Small, diverse markets (such as the agricultural land market) are not well suited to statistical analysis, because probabilities are difficult to estimate, ranges are large and high levels of uncertainty abound (Holstein, 2003:40; Isakson, 2001:424; Kummerow, 2002:409 - 411; Thair, 1988:194-196).

Another problem with the use of statistics is that they suggest that market value is one value within a possible range of random variables, which is evenly distributed if often repeated (Reynolds, 1995:82; The South African Property Education Trust, 2004:83). No repetition occurs in valuation: a valuer is asked to provide one value (although, if a large number of valuers estimated the value of the same property, a normal distribution for the property's value would arise) (Reynolds, 1995:82-83).

Acquiring data for rigorous statistical analysis is a cumbersome, expensive and timely process that few valuers can afford if they want to be competitive (Smith, 1995:83). Utilisation of statistics assumes that valuers have sufficient knowledge of the subject to undertake such analyses. Arguments have arisen that valuers are first and foremost valuers, not statisticians and that there is

no substitute for a valuer's experience and judgment to choose comparable sales and estimate market value (Ratcliff, 1972a:486; Reynolds, 1995:85).

The debate regarding HBU and market value gathered momentum in the 1970s and reached a peak in the 1980s. Thereafter, literature regarding these topics declined and since 2000 only a handful of articles has been published where HBU and market value concerns were addressed. Although mainstream international text books on valuation practices are available in South Africa (albeit no recent additions), very little research on valuation and specifically agricultural valuation has been done in South Africa.

2.3.6 Solutions to the problems associated with market value and HBU

2.3.6.1 The provision of relevant additional information

Valuations are economic analyses and estimations under uncertainty, dictated by human behaviour (Boyd, 1990:101-102; Finch and Casavant, 1996:198; Ratcliff, 1975:486; Reenstierna, 1985:123; Smith, 1986:2). For this reason a substantial amount of valuation literature is dedicated to the improvement of valuations by the inclusion of more and better information to provide insight into the thought processes of buyers and sellers through in-depth research and analysis (Holstein, 2003:37; Swenson, 2005:28).

The formation of value is not a clear-cut scientific process, but the result of personal preferences and perceptions. Valuers need to apply skill, experience and good judgment to merge psychological, statistical and economic information to determine the source(s) of value of a property in order to estimate and report it in a professional yet understandable manner (Babe, 1969:642). More complex valuations, such as for agricultural properties, need to be researched better for accuracy (Mazengarb, 1942:228; McAloon, 1986:313). All factors affecting market value must be researched in market analysis (Grissom, 1985:217-218; Kummerow, 2002:413; Ratcliff, 1972b:1). Even outliers need to be mentioned if occurring under open market conditions (Fraser, 1991:36). It is better for valuers to broaden their investigations to reflect actual market conditions (Boyd, 1992:85; Connolly, 1993:486; Coombs, 1956:115). Valuers provide an informed opinion that must be substantiated: they need to be transparent regarding what they can and cannot do, as well as the level of uncertainty they face (Albritton, 1980:205; Colwell, 1979:58; Prag, 1995b:10-12; Ratcliff, 1972a:524-525; Reenstierna, 1985:116; Vandell, 1982:266).

At the same time clients calling for valuation reports are not only interested in the estimation of a market value for a property, but also in the valuer's reasoning regarding the decision of the HBU and choice of comparative sales (Connolly, 1993:485-486). Informative and comprehensible valuation reports assist clients in understanding the market better and improve their decision making, while increasing the reliability and accuracy of valuations (Reenstierna, 1985:115). Clients need a true reflection of market conditions (Boyd, 1992:89) and not an oversimplified report that is of limited use.

Ways to improve the quality of valuation reports have been suggested. The use of graphs to indicate several uses and the probabilities of each being realised has been explored to provide more information to the client on the different use options of a property in an easily understandable manner. However, this is data-intensive and valuers need to know the types of buyers and probability of a certain use being realised. This could arguably be done for residential property, but would be extremely difficult to do for agricultural properties. Other ways to convey more information to the users of valuation reports recommend a statistical approach, such as the specification of a range of market values, instead of a single point (in line with MPP and MPU). Valuers could also include an estimate of the accuracy of their valuations (Hill, 1990:234-235, 240; Miles, 1980:540).

Buyers are central to the valuation process. Valuers need to understand the motivations, preferences and behaviour of different types of buyers and must reproduce buyers' actions to interpret the market (Boyd, 1992:87; Hill, 1990:234, 260; Lennhoff and Elgie, 1995:276; Miles, 1980:540; Ratcliff, 1975:486; Rowland, 1991:332; Whipple, 1990:14). However, valuers should bear in mind that buyers do not possess all relevant information and do not rely on court cases and lengthy valuation manuals to assist them in determining the value of a property (Tanucci, 1974:521). For this reason valuers should simulate buyer behaviour, and not perfection. Ultimately a valuation remains an opinion of the market value of a property and the valuer's own awareness/consciousness, experience and judgment play an important role in the valuation. For this reason it is paramount that valuers study market forces well, as they still rely on judgment and experience to value a property (Falconer, 1971:613).

The compound nature of rural land is an indication that valuers need to gather more information and do more research on alternative uses to understand markets better and present clients with the best possible product (Ellenberger, 1983:91; Jonker, 1984:125; Woods, 1969:598-600). Spending more

time on research has cost implications: the cost of additional information must be weighed up against the benefit of additional information that could enhance decision making (Vandell, 1988:349).

This study is not critical of HBU *per se* as the term is broad enough to accommodate land use transition and an increase in possible alternative uses of properties in valuation analysis. The problem does not lie with the extent of value attributes that can be accommodated within the HBU realm, but rather with the added uncertainty associated with the expansion of the number of uses of a property.

Instead of choosing the HBU early in the valuation process, valuers should admit that these valuations are complex, with increased uncertainty, necessitating in-depth analysis of agricultural properties and meaningful investigations of alternative use options in order to provide clients with the best possible information (Vasquez *et al.*, 2002:70). This will enable clients to make the best decision. Because of their heterogeneous nature, rural properties need a wide-ranging HBU analysis. If the choice of the HBU for a property is postponed until more information on buyer behaviour and preferences, as well as property characteristics are available and different perspectives are investigated, a more informed decision can be made.

2.3.6.2 The use of multiple perspectives

The decision of HBU on agricultural land where alternative uses are possible involves uncertainty and valuers need to make this decision with limited information at their disposal (Ribeiro *et al.*, 1995:183). For this reason, the ability to view the farm and its attributes from different perspectives and acquire more information regarding farm trends, attributes valued by buyers and types of buyers in the market will assist valuers in making informed decisions regarding HBU (Hall *et al.*, 2005:279). In a complex system characterised by uncertainty, where components interact with each other to create an outcome that cannot be separated into its respective parts, the use of multiple perspectives becomes relevant to provide unique insight from different angles, that cannot be obtained in isolation (Linstone and Mitroff, 1994:108). The determination of the HBU on farms where alternatives uses could be pursued is a complex problem that cannot be analysed in one dimension, but needs to be researched on many levels and in many ways in order to understand the system and its functioning.

Sometimes one perspective can help to understand a different perspective better, through interaction as well as integration between perspectives. Viewing a complex phenomenon from several angles contributes to better and broader comprehension and unravel links between characteristics (Linstone, 1984:22; Linstone and Mitroff, 1994:108-110). For example: a farmer does not want to buy an isolated property with bad access roads where he struggles to get his produce to the market, but a lifestyle buyer who wants to escape from the fast pace of the city might be interested in such a property. Perspectives from other parties, such as a possible failed buyer and the seller are also important. Valuers need to simulate human behaviour, and human decision making draws on different perspectives. By looking at multiple, interacting perspectives, a better balance can be reached. Even though there is a common belief that simplification leads to the solution of problems and people try to reduce the number of variables in order to better understand problems and formulate solutions, this is not an adequate reflection of reality (Linstone and Mitroff, 1994:93-96, 113).

2.3.6.3 The use of Hedonic Pricing Modeling to determine the characteristics of land

Although land has a heterogeneous character, its individual characteristics cannot be traded directly in the market. Economists and land valuers have resorted to statistical techniques such as Hedonic Pricing Models (HPM) in attempts to isolate the characteristics that contribute most to the market value of properties (Hussen, 2004:150-151; Isakson, 2001:424; Platinga *et al.*, 2002:562; Vasquez *et al.*, 2002:70). The HPM operates on the principle that the value of a diverse good, such as land, can be modelled as a function of its characteristics, and by decomposing land into its respective components, it becomes easier to understand which characteristics contribute most to the value (Rosen, 1974:34-55; Van Zyl, 2007:23-26; Vasquez *et al.*, 2002:70). In other words, the value of a differentiated good can be determined by the sum of its individual characteristics.

Most HPM used in the literature is based on the theoretical model forwarded by Rosen (Rosen, 1974:34-55) and is specified as:

$$P(z) = P(z_1, z_2, \dots, z_n)$$

where the price of a piece of land $P(z)$ is a function of its z characteristics as determined by dealings in the market. It follows that the average price of the piece of land will always be the dependent variable in the hedonic equation, and various characteristics will be included as independent variables.

The HPM has been used in both rural and urban land markets (see Annexure 1 for a summary of selected HPM studies). Most HPM studies on rural properties have focused on the contribution of agriculturally productive characteristics towards the price of the property, under the hypothesis that farms with high agricultural potential demand higher prices than farms with less productive capacity (Castle and Hoch, 1982:8; Feng *et al.*, 1993:356; Huang *et al.*, 2006:458; Kennedy *et al.*, 1997:6; King and Sinden, 1988:242; King and Sinden, 1994:38; Lopez *et al.*, 1994:53; Maddison, 2000:519; Palmquist, 1989:23; Pyykkonen, 2005:1; Schott and White, 1977:472; Vasquez *et al.*, 2002:69; Wise and Dover, 1974:105; Xu *et al.*, 1993:356).

Results of these studies indicated that differences in agricultural production associated characteristics such as soil quality, carrying capacity, irrigation variables, location (distance to markets), climate, elevation, size of the farm and buildings were significant in explaining differences in average farm prices per acre (Boisvert *et al.*, 1997:1661; Cotteleer *et al.*, 2008:8; Feng *et al.*, 1993:356 - 370; Henderson and Moore, 2006:607; Huang *et al.*, 2006:458, 468; Kennedy *et al.*, 1997:50; King and Sinden, 1988:242; King and Sinden, 1994:38-42; Lopez *et al.*, 1994:53, 60; Maddison, 2000:519, 530; Pyykkonen, 2005:1; Schott and White, 1977:427-434; Vasquez *et al.*, 2002:69, 75; Wise and Dover, 1974:103). Soil quality, agricultural potential, functional infrastructure and irrigation potential all had a positive relationship with farmland value, while size, distance to nearest urban centre, elevation and slope had negative effects on these values.

Some studies indicated, however, that farm prices could not solely be explained by earnings in agriculture and that other factors were important, even though these factors were not listed (Castle and Hoch, 1982:16). Attempts were made to include factors such as buyer and seller characteristics as explanatory variables in modelling as this could contribute towards a better understanding of land markets, while such determinants could also act as proxies for other omitted variables for which little information is available (Dunford *et al.*, 1985:16; Ejimakor, 1995:101-103; Isakson, 1997:103, 112; King and Sinden, 1994:50-51).

Other studies focused on the impact of urban influences on the value of farmland (Chicoine, 1981:353-362; Drozd and Johnson, 2004:294; Dunford *et al.*, 1985:10-16; Hardie *et al.*, 2001:120; Livanis *et al.*, 2005:1; Paterson and Boyle, 2002:417; Platanga *et al.*, 2002:561-579; Shi *et al.*, 1997:90; Shonkwiler and Reynolds, 1986:58-59). In transitional areas close to urban centres where both urban and rural influences are present, market prices are affected by competing motivations

(agricultural versus non-agricultural) of parties operational in the market. Researchers wanted to test the assumption that present agricultural land values reflect both current and future agricultural values, as well as potential development income. This meant that HPM studies had to be expanded to include other characteristics influencing farmland prices at the urban fringe, the most prominent being population density, population growth, location of highways and distance to urban centres (Beale and Johnson, 1998:37; Hardie *et al.*, 2001:132). Most studies concurred that non-farm factors also affected land prices and that the potential future development of farmland for urban uses were capitalised into farmland values and that variables such as population density and population growth, as well as distance to urban centres were highly significant in explaining values (Chicoine, 1981:353-362; Drozd and Johnson, 2004:294; Dunford *et al.*, 1985:10-16; Paterson and Boyle, 2002:417; Platinga *et al.*, 2002:561-579; Shi *et al.*, 1997:90; Shonkwiler and Reynolds, 1986:58-59; Weerahewa *et al.*, 2008:30).

A limited number of hedonic price studies investigated the effect of natural amenities (aesthetic appeal) on farmland values (Bastian *et al.*, 2002:337; Guiling *et al.*, 2007:1; Henderson and Moore, 2006:597; Pope, 1985:81; Reynolds and Regalato, 2002:182; Schutjer and Hallberg, 1968:572; Shrestha and Alavalapati, 2004:763; Spahr and Sunderman, 1999:227). As with studies regarding farmland close to urban centres, it was hypothesised that the presence of specific natural amenities would influence land prices upward. Attributes such as vegetation cover and trees (Schutjer and Hallberg, 1968:572; Shrestha and Alavalapati, 2004:770-771; Spahr and Sunderman, 1999:227), as well as the presence of views (Bastian *et al.*, 2002:337; Guiling *et al.*, 2007:1-2; Spahr and Sunderman, 1999:227) and wildlife habitat with recreation opportunities (e.g. hunting, fishing) had a positive effect on farmland values (Bastian *et al.*, 2002:337; Guiling *et al.*, 2007:1-2; Pope, 1985:81, 86). For this reason agricultural land in specific areas derives its value from a combination of productive and non-productive attributes (Spahr and Sunderman, 1999:233) and the presence of recreational opportunities and scenic views could lead to higher prices than those dominated by pure agricultural production (Shrestha and Alavalapati, 2004:763).

Interestingly, some attributes such as the presence of water (e.g. streams, wetlands), together with elevation and slope seem to have opposite effects on farmland values, depending on whether they are valued for aesthetic reasons or for agricultural production (Guiling *et al.*, 2007:1; Lopez *et al.*, 1994:53; Reynolds and Regalato, 2002:182; Spahr and Sunderman, 1999:227; Vasquez *et al.*, 2002:69). For example, a wetland might be perceived positively as a natural amenity that is both aesthetically pleasing and environmentally important, yet at the same time affects agricultural production potential negatively.

The benefit of Geographic Information Systems (GIS) in the identification of characteristics was also demonstrated in several studies (Bastian *et al.*, 2002:337, 347; Huang *et al.*, 2006:458, 468; Kennedy *et al.*, 1997:30-33, 50; Paterson and Boyle, 2002:417; Pyykkonen, 2005:1)

Even though HPM has been successfully employed with urban residential properties, its application to rural properties has had mixed results. The biggest reason for this is that HPM requires large datasets, which are attainable for residential property transactions, but similar arms' length agricultural sale transactions might be hard to find. The diverse nature of farmland and wealth of characteristics that add to its value are impossible to capture within a limited regression model (Isakson, 2001:424). At the same time hedonic models tend to be driven by data and not by theory (Hussen, 2004:151), which could create problems for the specification of the model, i.e. the choice of variables to include, and the robustness of the results (Isakson, 2001:424). HPM can also suffer from multi-collinearity (high correlations between independent variables) (Isakson, 2001:427; Morton, 1977:580 - 582; Van Zyl, 2007:45). Multi-collinearity can be reduced through factor analysis, where the number of variables is reduced by grouping variables that essentially measure the same thing together into factors and then derive a limited number of new factors to be included in the regression (Morton, 1977:580; Peterson, 1986:4). Conversely, sometimes the characteristics of an entity cannot be separated, because the sum of the parts adds up to more than that of the individual components. In addition, HPM cannot deal with multiple uses simultaneously (Shonkwiler and Reynolds, 1986:63).

Land prices tend to be area specific (Dunford *et al.*, 1985:10; Hardie *et al.*, 2001:120; Platinga *et al.*, 2002:562; Shi *et al.*, 1997:90; Shonkwiler and Reynolds, 1986:58), and since most these studies were undertaken in the United States, they are of limited use.

Hedonic pricing studies tend to rely on what is already known and cannot accommodate subjective, intangible characteristics. While recent studies touch on amenity characteristics such as scenic views, most aesthetic components are not explained in detail and it is not always clear exactly what is being measured, as proxies are in most cases used for certain variables (e.g. hunting licences for appreciation of wildlife habitat). Admittedly, these attributes are difficult or even impossible to represent statistically, as alternative uses of agricultural land are not always related to income derived from the property, but to the satisfaction they provide (Healy and Short, 1978:198; Hendy, 1998:144). At the same time amenities have sociological, economic and environmental dimensions that mean different things to different people (Deller *et al.*, 2005:131). In the literature amenities

have been treated in an *ad hoc*, simplistic and theoretical fashion, limited to a single, one-dimensional attribute, a list or index of attributes (Green *et al.*, 2005:330), with little understanding of the complex interrelationship between these amenities. In reality these amenities are multi-dimensional, difficult to conceptualise and include both market and non-market (amenity) based aspects that interact with each other (Power, 2005:72).

Similarly, the valuation of farms within a multi-functional agricultural market is complex and the formulation of market value is the result of many interdependent factors where buyers are attracted to the “total package” of the property. The complexity in valuations occurs less as a result of the many different characteristics associated with agricultural land (although this is also problematic) but more because of the interactions between characteristics that increase uncertainty and hamper effective choices regarding the HBU of a farm. This corresponds with the complexity theory, where problems are solved by collecting more information, “free-wheeling” (where as many ideas as possible, no matter how extreme, are considered) and delaying judgement (i.e. postponing the decision of HBU) (Henry, 1991:120; Rosenhead and Mingers, 2001:339).

Individual characteristics can be identified, but they form part of a bigger entity and cannot be separated (Arriaza *et al.*, 2004:115). The synergy between these characteristics gives rise to a unique product, which is difficult to break down into components in order to estimate a value. The isolation of characteristics could then lead to part-whole bias, because the sum of the parts does not equal the value of the total good (Kallas *et al.*, 2007:409).

This occurrence has been identified as “emergence” within the systems theory thinking realm. Systems theory thinking developed as an alternative approach to solve complex problems for decision making (Daellenbach and McNickle, 2005:6, 18, 39). It provides a structure to analyse components that act together to provide an outcome and is based on the view that complex phenomena consist of interrelated parts (components) that together form a system and are explained in terms of their role in the system (Daellenbach and McNickle, 2005:18; Haines, 1998:16-17). According to the principle of emergence, the sum total of the components of an object (e.g. a farm) is not equal to the value of the object, as the interaction between components gives rise to a value that is more than just the parts added together. The elements within a system can only be explained through their interaction, interrelationship and linkages with other components of the system, as a system forms a broad, holistic unit made up of interconnected components. For this reason focus should be directed to the system as a whole, which may display behaviour that the individual components by themselves would not (Daellenbach and McNickle, 2005:39).

An outcome of a complex system (for instance the market value of a farm) is the result of the sum or the difference of forces that work together and can best be explained through understanding the patterns of interconnectedness, interdependence and interaction between components (Daellenbach and McNickle, 2005:18, 39; Haines, 1998:17). This complexity and interconnectedness cannot be captured with HPM.

Although this study does not make use of hedonic modeling, an overview of hedonic studies is useful in that it provides a starting point for identifying the characteristics that are significant in the determination of farmland values. The objectives of this study are to establish which characteristics are associated with lifestyle purposes and to determine whether farm characteristics associated with production differ from characteristics associated with lifestyle purposes. No reference is made to prices, and characteristics are not linked to selling prices at all.

A number of HPM studies have been done regarding the effect of natural amenities on urban residential property prices (Bourassa *et al.*, 2004:1427; Cho *et al.*, 2006:2; Paterson and Boyle, 2002:417; Tapsuwan *et al.*, 2007:1). Characteristics associated with the aesthetic beauty and natural amenities provided by agricultural land have not been dealt with comprehensively in HPM studies, mostly because these attributes are complex, vague and hard to pin down (Pope, 1985:81).

Several other studies attempted to clarify the meaning of the concept natural amenities and identify natural amenities that appeal to people by researching people's emotional attachment to land (Brehm *et al.*, 2004:405; Winkler *et al.*, 2007:478), the growth of rural populations in amenity rich areas (urban-rural migration) (Dearien *et al.*, 2005:113; Green *et al.*, 2005:13-16; Hunter *et al.*, 2005:452; McGranahan, 1999:1-19; Stedman *et al.*, 2005:208), preferences for land use and sales (Inman *et al.*, 2002:72), the attitudes of seasonal home owners versus permanent residents towards amenities (Clendenning *et al.*, 2005:3) and the impact of natural amenities on tourism and recreation opportunities in rural areas (Deller *et al.*, 2005:129; Dissart and Marcouiller, 2004:153; Schultz, 2007:133).

Public preferences for rural amenities such as open space were assessed (Antrop, 2004:170; Goe and Green, 2004:95; Palang *et al.*, 2004:231), mostly through willingness-to-pay questionnaires (Arriaza *et al.*, 2004:115; Kallas *et al.*, 2007:405; Kline and Wichelns, 1998:211; Nickerson and Hellerstein, 2003:129). These studies indicated that topography, climate, water, scenery, outdoor recreation and quality of life are valued amenities. However, these studies looked at the

preservation of landscapes from a public perspective, with the focus primarily on land use planning and management of landscapes and not from a valuation perspective. Although these studies were undertaken with different objectives in mind, they are useful in facilitating a better understanding of natural amenities and aesthetic beauty (see Annexure 2 for details of characteristics of natural amenities as described in selected studies).

2.4 Conclusion

This chapter serves as a review of applicable valuation theory and provides the theoretical basis for the research problem. The complexity of valuations caused by a range of interrelated factors and the compound effect of the transition from a rural landscape dominated by agricultural production towards a multi-functional landscape where alternative uses were present, was explained. The concomitant proliferation of uses for agricultural properties makes rural land valuations more demanding because uncertainty of the choice of the HBU is heightened.

The significance of the terms HBU and market value within the market sales comparison approach was discussed. Problems experienced with their use and the exploration of the terms MPU and MPP as possible substitutes for HBU and market value were investigated. The use of statistical analysis to deal with uncertainty in valuations through the introduction of ranges and probabilities instead of a single point estimate were discussed, as well as the application of HPM in the determination of attributes relevant to agricultural land. Valuation literature emphasises the importance of research and analysis, the provision of more information and the simulation of market behaviour in valuation practice. The use of a multiple perspectives approach when dealing with agricultural properties where alternative uses are possible could facilitate better decision making.

3. METHODOLOGY AND USE OF THE MIXED METHODS RESEARCH STRATEGY

3.1 Introduction

The problems surrounding the valuation of agricultural land where multiple uses are possible was outlined in Chapter 1. This was followed by a theoretical overview of valuation literature in Chapter 2, where valuations were described as the choice of the HBU under uncertainty, complicated by subjective buyer preferences, multiple uses and limited market information. The choice of the HBU implies a set of relevant value attributes, but lifestyle buyers of agricultural properties possibly value different characteristics from those traditionally stressed by typical production oriented buyers. The market sales comparison method requires valuers to think like the typical buyer and a deviation in the interpretation of a property as a result of the emergence of lifestyle buyers, could be an indication that valuers are emphasising inapplicable value-bearing attributes.

In the past valuers based their estimations of market value on farming as HBU and the production potential of the land for the income it could generate. The value attributes associated with lifestyle as the HBU on agricultural properties, however, are dependent on buyers' subjective interpretations and do not (necessarily) depend on income to be generated from the property. This presents valuers with a measurement problem, as they are left without a base and reference point from which to value such properties. For this reason they tend to emphasise the easily measurable characteristics, while the less concrete characteristics of agricultural properties preferred by lifestyle buyers are omitted. As valuers need to be able to defend their estimations of market value in a court of law, it is understandable that they would fall back on production as the HBU and the farmer as the typical buyer, where hard (income) data can be used to back up valuations, instead of basing market value on vague and subjective preferences of buyers.

This chapter explains how a mixed methods research strategy is used to determine:

- whether the interpretation of the value attributes of a farm where lifestyle considerations are present differ between valuers and buyers of such properties, and to identify characteristics associated with lifestyle buyers (qualitative method);
- whether the interpretation of the value attributes of farms as perceived by lifestyle oriented buyers and farm oriented buyers differ and what their demographic profiles look like (quantitative method).

The rationale for using a mixed methods research strategy with a sequential exploratory design is provided in the next section. This is followed by an explanation of the case study approach followed in the qualitative stage and a description of the way in which its findings are used to develop a questionnaire for the quantitative stage. The questionnaire is used in a survey of agricultural land buyers within both an intensive and an extensive area in the Western Cape Province and serves to support the findings of the qualitative stage.

3.2 Motivation for using the mixed methods research strategy

The purpose of social research is to understand complex human behaviour and experiences through qualitative or quantitative methods, or a mix of these two methods (Morse, 2003:189). Qualitative and quantitative methods have different emphases and limitations, and answer different questions, which is why the mixed methods approach has emerged as a third methodological movement in social science research. Mixed methods research is defined as research where both qualitative and quantitative data is collected or analysed within a single study. Data are collected at the same time or one after the other, given a priority and combined in one or more stages of the research process (Creswell *et al.*, 2003:212). The combination of qualitative and quantitative methods in one study provides a different level or higher order of data that facilitates in-depth understanding of a phenomenon from a range of perspectives (Creswell *et al.*, 2003:211; Morse, 2003:205; Tashakorri and Teddlie, 2003:93-94, 672).

The research question in this study has qualitative and quantitative dimensions. For this reason a mixed methods strategy that consists of a qualitative phase done as a case study, followed by a survey in the quantitative phase, is carried out. The emphasis of qualitative research in general is to explore new phenomena to understand complexities and focuses on the provision of in-depth information. The emphasis of the case study approach in particular is to identify the unknown and more intangible characteristics associated with purchases of farms motivated by lifestyle aspirations. The hypothesis that valuers apply mostly farming related variables when valuing farms bought primarily for lifestyle purposes, but that the value attributes that appeal to lifestyle buyers diverge from those used for conventional farming, is investigated. Identified attributes are then included in a questionnaire sent to land owners. The purpose of the quantitative survey is to test statistically the hypothesis that the identified value attributes that appeal to lifestyle buyers differ from those of traditional production oriented buyers.

The open-ended nature of qualitative research provides an opportunity for the identification of new, unanticipated considerations associated with lifestyle buyers, which could then be tested quantitatively through statistical analysis. Valuers stick to characteristics that are known to them, even though they are increasingly becoming aware of the inappropriateness and inadequacy of using these characteristics for valuing lifestyle considerations (Louw, 2006:1-4). They are, however, aware of lifestyle considerations which do influence their thought processes, but they are unsure about the way in which to incorporate these considerations in valuations. For this reason the strengths of both qualitative (identification of new considerations) and quantitative methods (confirmation of statistical significance of newly identified considerations) are combined in order to provide more solid and comprehensive results. This corresponds with the fundamental principle of mixed methods research that the methods used must have complementary strengths and no overlapping weaknesses (Tashakorri and Teddlie, 2003:47, 299, 672).

Multi-functionality and the emergence of alternative uses of farms such as for lifestyle purposes suggest that valuers must deal with multi-dimensional realities and multiple perspectives. These perspectives cannot fully be understood using one method or data source. The use of both a qualitative and quantitative method within one study offers a greater diversity of views and allows for the inclusion of a variety of data sources, which broadens the extent and scope of questions answered (Creswell *et al.*, 2003:211; Morse, 2003:195-196; Tashakorri and Teddlie, 2003:16).

The use of mixed methods assists in between-method triangulation¹, where the use of the qualitative and quantitative methods leads to multiple inferences and confirmations. Different methods that yield similar results offer better and stronger inferences, while qualitative and quantitative methods combined also provide a more comprehensive set of findings (Onwuegbuzie and Teddlie, 2003:353; Tashakorri and Teddlie, 2003:16). A higher level of certainty could thus be achieved through the

¹ Triangulation is a term regularly used (and abused) within qualitative research and specifically in case study research. It is borrowed from the discipline of land surveying and is based on the principle that a point in space can be determined through recognised trigonometric laws if two other points are known. It is used in the social sciences to describe research strategies that use different methods to answer the same question, or alternatively to describe the collection of data from different strategies in order to improve the validity of results. It is based on the principle that the confirmation of a hypothesis through two or more independent measurement processes decreases uncertainty in its interpretation (Tashakorri and Teddlie, 2003:459-461).

Different forms of triangulation are used in social research. Data triangulation refers to the gathering of data through different sampling strategies and from a variety of sources, while investigator triangulation refers to the use of more than one investigator in the data gathering or interpretation processes. Theoretical triangulation is the use of more than one theoretical position in interpreting data and methodological triangulation refers to the use of two or more methods in data collection and a distinction is made between within-method and between-method triangulation (Stake, 1995:112-113).

verification of the core method with a supplemental strategy, such as in this study, where the findings of the qualitative phase are included in a questionnaire and statistically tested in order to provide stronger conclusions to reduce uncertainty (Creswell *et al.*, 2003:211; Morse, 2003:195-196).

It must be stressed that the use of a mixed methods strategy is no substitute for poor research and that two methods do not necessarily guarantee better results. Concentrating on the strengths of each method may improve the quality of inferences and supports in-depth understanding, but the main purpose for undertaking mixed methods research should never be for one method to validate another (Creswell *et al.*, 2003:211; Morse, 2003:195-196; Tashakorri and Teddlie, 2003:16, 35, 146). For this reason triangulation has been subjected to much criticism: performing two studies for the sake of increased validity is a poor reason for triangulation. Likewise, it must be borne in mind that mixed methods strategies are more complex to execute, requiring additional time and effort, while both methods could be exposed to the same errors and bias. The use of a second method for supplementary purposes (also done in this study) can only contribute to in-depth understanding of lifestyle buyers' preferences (Tashakorri and Teddlie, 2003:460-461).

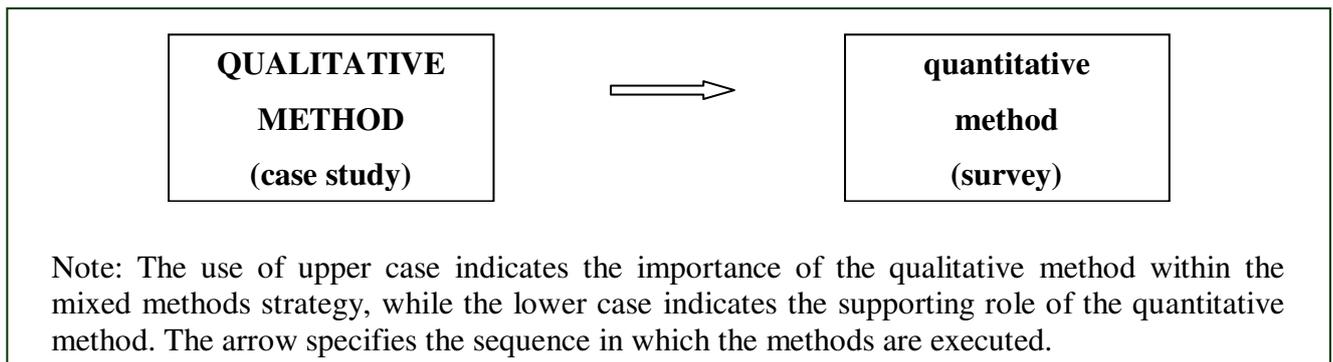
3.3 The sequential exploratory mixed methods design

Over the years a classification of mixed methods and multi-method designs has emerged from the literature (see Creswell *et al.*, 2003:214, 216-217 for more detail). Many typologies are evident in mixed methods research, as a result of permutations resulting from combinations of quantitative and qualitative data collection and analysis options as researchers from different disciplines adapted methods to fit their specific needs (Creswell *et al.*, 2003:231; Morse, 2003:198, 214; Tashakorri and Teddlie, 2003:33). It follows that mixed methods typologies are non-exhaustive and the determination of a typology within the mixed methodology continues to be a controversial issue (Tashakorri and Teddlie, 2003:680).

A sequential exploratory mixed methods strategy is carried out in this research, where a qualitative research investigation, followed by a quantitative study, is combined in a single mixed methods strategy (see Figure 1). The qualitative phase consists of case studies which are carried out within the boundaries of South Africa, followed by a quantitative phase in the form of a survey undertaken within an intensive and extensive farming area in the Western Cape. The qualitative study (case studies) forms the base or core project of the overall study and its findings are used to develop a

questionnaire which is then used in the survey (quantitative phase) in order to test elements of an emerging theory by generalising the qualitative findings to different samples (Creswell *et al.*, 2003:234). Priority is given to the qualitative phase, because it forms the basis for the study and provides the necessary information to be used as input for the quantitative phase, which is carried out as a response to the findings derived in the qualitative phase. The exploratory nature of the overall research project causes the theoretical drive to be inductive.

Figure 1: Sequential exploratory mixed methods typology



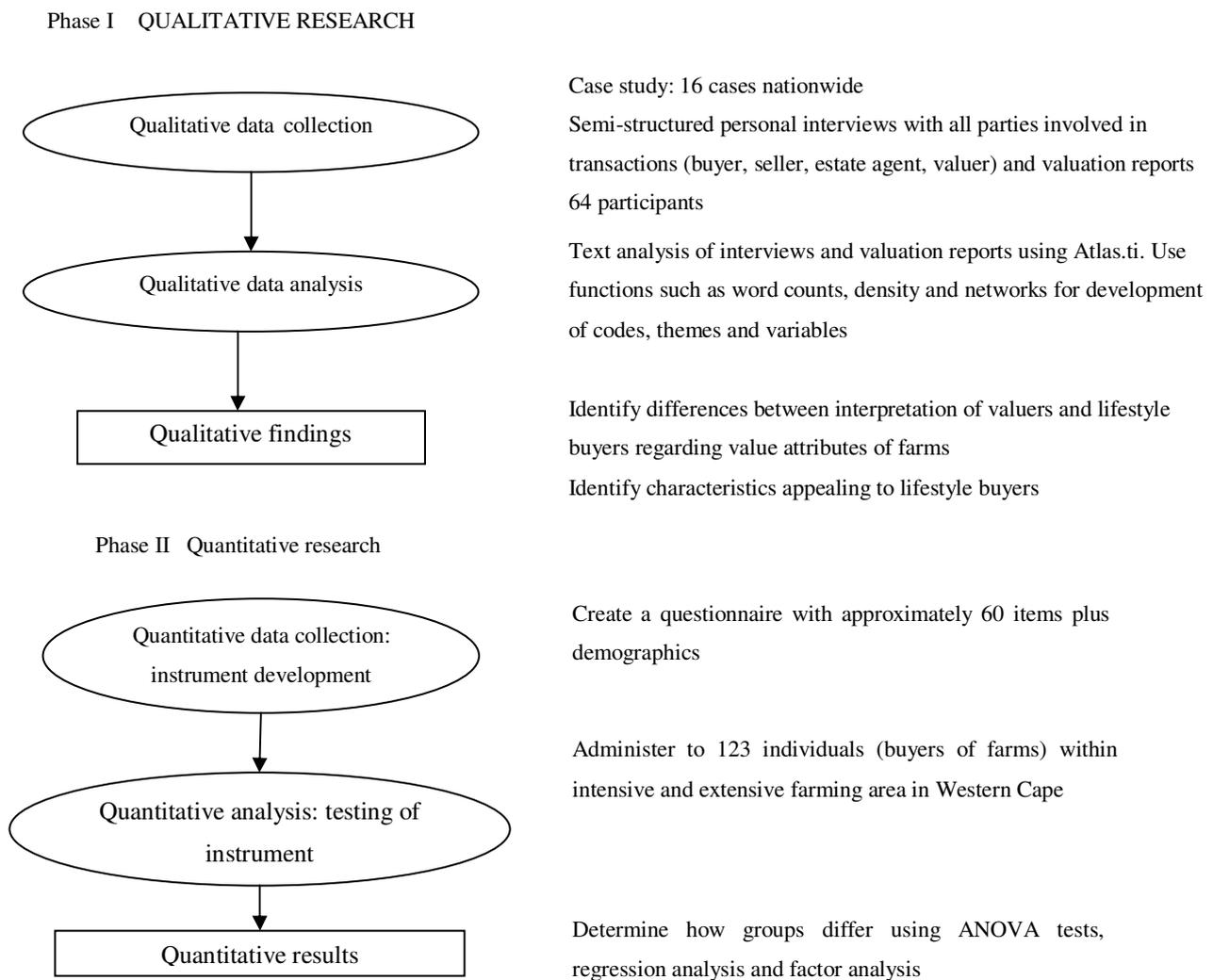
Source: adapted from (Morse, 2003:197-198).

Although the methods followed in each phase are discussed in detail in the following section, it is important to explain how these methods are used together, as indicated in Figure 2. A case study approach is used in the qualitative phase to provide in-depth information regarding lifestyle buyers and the attributes that appeal to them. The qualitative data is collected from multiple sources, including personal interviews, valuation reports and direct observations. This information is then transformed into text and analysed with the help of a qualitative software analysis computer package (Atlas.ti) in order to identify the characteristics of agricultural properties that appeal to lifestyle buyers and to determine whether the perception of value bearing attributes of farms by valuers and lifestyle buyers differ.

Data consolidation occurs when these value attributes (variables) are integrated into a questionnaire which is used in the quantitative survey undertaken amongst land owners. The objective of the survey is to determine whether the attributes of lifestyle buyers and production oriented buyers differ and to assist in the identification of patterns, themes and variables applicable to lifestyle buyers through statistical analyses such as descriptive statistics, regression analysis and exploratory factor analysis. The quantitative phase supports the qualitative phase as stronger conclusions can be drawn (Onwuegbuzie and Teddlie, 2003:355). The findings are integrated within the data collection

and analysis phase and conclusions are based on both methods (Creswell *et al.*, 2003:218; Tashakorri and Teddlie, 2003:687).

Figure 2: Mixed methods procedures: Data collection and analysis



Source: adapted from (Creswell *et al.*, 2003:235).

The purpose of the mixed methods analysis in this study can be summarised as:

- Complementary - the selected methods of inquiry are used to view the attributes that appeal to different types of buyers of agricultural land from different angles and the results from the qualitative phase are confirmed in the quantitative phase
- Developmental – the case study results are used to develop a questionnaire
- Triangulating – description of the data collection procedures followed in the qualitative and quantitative methods improve the validity of results.

3.3.1 The qualitative phase: a case study approach

This section is made up of a definition of the case study approach, followed by the motivation for choosing it for this particular study and the operational procedures applied in its execution.

Case studies are defined as empirical investigations that consider recent phenomena within its unique context, even though the line between phenomenon and context might be blurred. This is done through the collection of several sources of evidence, such as interviews, documents and physical artifacts (Eisenhardt, 1989:534; Stake, 1995:134; Yin, 1984:23). It is a research strategy that explores, describes and/or explains empirical questions by using either qualitative or quantitative procedures specified at the beginning of the study (Yin, 1984:25; 1993:3).

3.3.1.1 Motivation for using the case study approach

The research question in this study is whether a reinterpretation of value attributes of farms is necessary because of the presence of lifestyle buyers in the agricultural land market. This question is addressed by breaking it up into the following questions with their respective hypotheses:

Question 1:

To what extent do valuers apply farming related value attributes and lifestyle related value attributes when they value farms bought for lifestyle purposes as confirmed by buyers?

Hypothesis: Valuers apply mostly farming related value attributes when valuing farms bought primarily for lifestyle purposes.

Question 2:

What are the typical value attributes of farms that appeal to the aspirations of lifestyle buyers (how can the selection of the HBU of agricultural properties be improved)?

Hypothesis: The applicable value attributes of the lifestyle motivated buyer diverge from the buyer that is primarily production oriented and these attributes can be identified and statistically regressed (in the quantitative phase).

These questions relate to *how* the selection of the HBU of agricultural properties could be improved and can be answered through an investigation of the different perspectives of lifestyle buyers and agricultural land valuers involved in transactions where lifestyle considerations are present. The type

of research question, complexity, the extent of control the researcher has over events and the emphasis on contemporary events all play a role in the choice of a case study as the preferred research approach (Eisenhardt, 1989:536; Yin, 1984:19). The presence of lifestyle buyers is a contemporary phenomenon where the researcher has no control over the events. In a similar fashion, valuations of farms in general are complex processes where many factors need to be taken into account in the decision of the HBU; the presence of lifestyle buyers complicates these valuations further by increasing the uncertainty over the choice of the HBU.

One of the case study approach's strengths is that it is well suited to explore new themes and develop new hypotheses, or old themes where new perspectives are needed (Eisenhardt, 1989:543, 548). In this study a new perspective is needed on the observation that the typical buyer of an agricultural property is a farmer who is interested in the productive potential of the farm. The emergence of lifestyle buyers of farms complicates the valuation process, because the attributes that appeal to this type of buyer are new, not well understood and often intangible in nature. Since valuers cannot account fully for these attributes, they tend to focus on the easily measurable characteristics, while the non-measurable characteristics of agricultural properties preferred by lifestyle buyers are avoided. This measurement problem - where valuers focus predominantly on the characteristics that are measurable at the expense of the less concrete characteristics that cannot be measured easily - narrows the decision making context as valuations are undertaken with partial information (De Lange, 2006:16).

Cases studies focus on the generation of "rich", in-depth descriptions of complex issues by using multiple sources of evidence, as opposed to other research strategies which are limited to one specific data source (Yin, 1984:90). A single data source and collection method would not be able to provide sufficient understanding or evidence of the considerations used by lifestyle buyers and how they differ from conventional production oriented considerations (Eisenhardt, 1989:542; Yin, 1984:14; 1993:3, 78). The in-depth focus of case studies often results in the creation of more variables than data points, which makes it difficult to incorporate into quantitative strategies (Yin, 1993:3). The case study approach, however, can manage many variables from different sources, which makes it an ideal method to use for the purpose of obtaining multiple perspectives of different parties involved in agricultural land transactions.

Case study research has been accused of lack of rigour, because of the opportunity for bias as a result of subjective sampling and reliance on researchers' interpretations. Even though bias could creep into any research strategy, researchers need to be especially vigilant in their design and

execution of case studies (Stake, 1995:134; Yin, 1984:48). In this study many sources of evidence are integrated to reduce bias. At the same time multiple sources of evidence are used for data triangulation, which refers to the gathering of data through different sources (valuation reports and personal interviews) in order to strengthen validity and increase confidence in the interpretation of collected data.

3.3.1.2 Case study design

This case study is exploratory and the unit of analysis - the actual “case” – represents the thought processes of valuers and lifestyle oriented buyers regarding the value bearing characteristics of farms bought for lifestyle purposes. Cases are identified using transactions of agricultural properties where lifestyle considerations played a role. The case study consists of a number of smaller cases in various geographical locations within South Africa (holistic multiple case study design). In turn, each case consists of semi-structured personal interviews with involved parties, the valuation report and a site visit to the farm under investigation. This makes farms bought for lifestyle purposes the unit of observation – a farm brings a case together and therefore provides the anchor point. The farm itself is neutral, although it is viewed subjectively by different parties.

Case study sampling procedures are based on replication logic, where each case is included subjectively, on the grounds of its contribution towards a better understanding of the phenomenon being investigated. This differs from standard sampling procedures done in quantitative studies, where sampling is done objectively, based on randomness (Yin, 1984:48). All cases included had to be excellent examples of purchases for lifestyle reasons that demonstrated different interpretations of value attributes as viewed by valuers and buyers.

Agricultural land valuers as listed on the South African Council for the Property Valuers’ Profession website (www.sacvp.co.za) were contacted telephonically, briefed about the study and asked to provide details regarding an agricultural property they valued where lifestyle motivations played a decisive role, or to suggest the name of another valuer who could. In this way literal replication was accomplished, with similarities between cases (all cases were agricultural properties bought primarily for lifestyle purposes). These details included the valuation report and the contact details of all parties involved in such a sale, which usually consisted of the valuer, estate agent, seller and buyer. Valuers were prompted to include other parties as well (for example a failed buyer), in order to collect as many sources of evidence and as many perspectives as possible. It was

suspected that sellers would focus predominantly on traditional production characteristics, while estate agents would have a good idea of the attributes appealing to lifestyle buyers. The inclusion of such dissimilar views leads to theoretical replication (Yin, 1984:48). A key requirement in the selection of cases was variation in terms of the valuers (i.e. differences with regard to age, level of experience, gender), types of farms and involved parties, to ensure diversity and adequate cover of different perspectives.

The selection criteria for cases were as follows:

- Lifestyle attributes, present and identifiable
- Difficulty in establishing the HBU (uncertainty), in the sense that it could be used for either production or lifestyle purposes
- Willingness of *all* parties involved in the sale to be personally interviewed, including buyer, seller, estate agent, valuer, and other (e.g. failed buyer)
- Availability of valuation report
- Arms' length transactions (market value)
- Farm sizes greater than 20 hectares (ha)
- Variability with regard to valuers in terms of age, experience, gender, race and type of farms valued
- Diverse farm types (e.g. cattle, game, horses, orchards, vineyards)
- Fairly recent transaction (respondents able to remember details of the transaction)
- Most cases to be undertaken in Western Cape Province, but few cases done in other parts of the country.

A short, one-time data collection strategy was planned, where each case would be concluded within a short number of days (typically two to three days), resulting in a data collection effort of approximately two to three months. The order in which parties were interviewed was varied to determine whether this sequence influenced the type of information provided by interviewees.

Case studies cannot be used to make generalisations from a sample to a population as done in statistical methods such as surveys, because sampling is done purposefully (Yin, 1993:91). Case studies, however, do provide a good basis for analytical generalisations from results to theory, as cases are chosen based on their contribution towards understanding of given phenomena (Yin, 1984:48-49). Literal and theoretical replications are crucial ingredients for multiple case studies, as they provide rich descriptions to be used in the specification of theoretical relationships and

identification of variables in order to identify the conditions under which lifestyle transactions are likely to occur.

The case study design was also expanded to a wider geographical range than the Western Cape in order to determine whether lifestyle influences were experienced in other areas in South Africa. Although farms value attributes are localised and a set of attributes used in one area cannot necessarily be used for another, the inclusion of more cases within a wider area could give an indication of the extent of the influence of lifestyle buyers in other regions. When results are generalisable beyond the immediate cases, external validity is attained.

A case study protocol that documented all procedures was drawn up to allow for the review and “audit” of the research (see Annexure 3 for the case study protocol). This increases reliability, by creating a chain of evidence that allows other investigators to follow the research from the initial question to its conclusions (Yin, 1984:64).

3.3.1.3 Preparation and collection of data

Valuers contacted were sent a letter that explained the purpose of the research and listed the information needed as well as the criteria to be used in the selection of cases (see Annexure 4 for the letter of explanation sent to valuers).

Semi-structured personal interviews with parties as identified by valuers would provide the necessary flexibility and best information regarding their respective interpretations of the agricultural property under discussion. Interviews were designed to take a conversational style. A questionnaire with questions that acted as prompts was developed to assist the interviewer in conducting the interviews. The main question was: “What appealed to you most when you bought/valued/sold/marketed this agricultural property?” All interviews were recorded with a digital recorder for transcription purposes.

Valuation literature (as discussed in the literature overview – see Chapter 2) and hedonic pricing studies were used as preparation for the interviews and the construction of the semi-structured questionnaire. The traditional characteristics of farms used in agricultural land valuation, as well as the difficulty in establishing the HBU and the role of the typical buyer in this process offered insight into the complexities of the determination of a single market value when alternative uses and

different types of buyers are present. Informal interviews with estate agents operational in the Western Cape agricultural land market and two agricultural land valuers, prior to embarking on the case study, provided further input.

The valuation report for each agricultural property contained valuers' perspectives and had to accompany cases. A site visit to each property was undertaken (if possible), preferably accompanied by buyers as this provided an opportunity to experience the value attributes that appealed to them first-hand. The sources of information for each case thus consisted of personal interviews, valuation reports of properties and direct observations (backed up with photographs taken on site visits). The use of multiple sources of evidence was important for reliability and validity. For this reason care was taken to incorporate the views of as many respondents as possible.

A pilot case study was done to test and refine data collection plans with respect to the questions asked and procedures followed in interviews. The pilot case was chosen based on convenience (a farm near Franschhoek) and accessibility of interviewees. Franschhoek is known for its strong lifestyle influences, therefore it provided an exemplary case of an agricultural property bought for lifestyle purposes. The valuer in the pilot case was experienced and could provide useful guidelines for approaching future cases. The questionnaire used for the interviews was adjusted after the pilot case (see Annexure 6 for the questionnaire used in semi-structured interviews) and the decision was made that as a last resort telephonic interviews would be conducted with respondents unavailable for personal interviews (e.g. respondent located overseas).

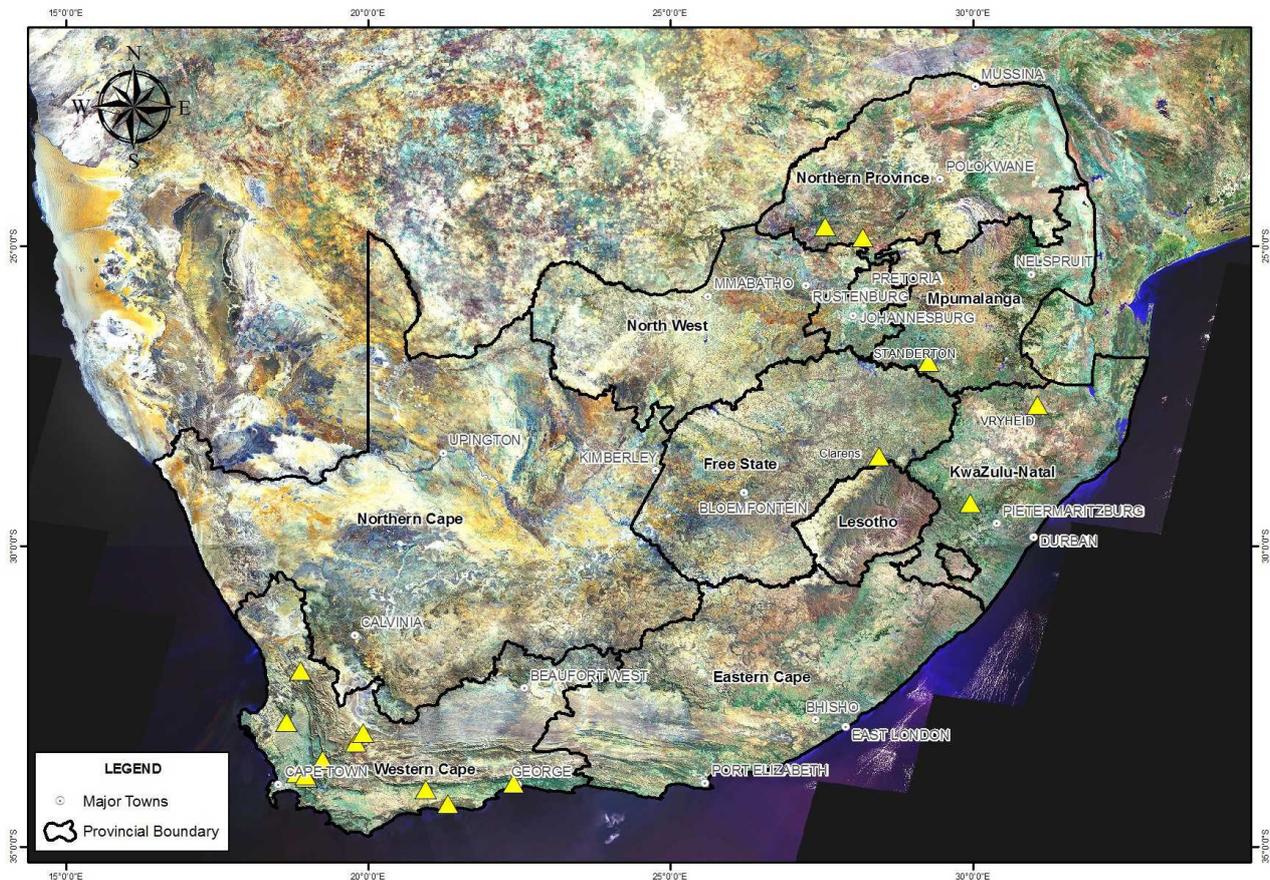
For various reasons the identification of cases proved challenging. In some instances valuation reports were confidential and permission had to be obtained from clients before the reports could be released by valuers. Attempts to promote variety with regard to valuers were only partially successful, as most agricultural valuers at the time were experienced white males. Other problems such as the unsuitability of transactions identified by valuers (e.g. non-arms' length transactions) and non-availability of possible respondents meant that a substantial amount of time was spent in this identification phase. Some people were not willing to participate in the research, while others were difficult to contact because they lived overseas.

All parties involved in a transaction were contacted telephonically to inform them about the research and to determine a date for the personal interview. This was followed up with a formal letter containing the purpose of the research and other details as discussed telephonically (see Annexure 5 for an example of the letter sent to buyers, but letters to other parties were similar).

All interviews were recorded with a digital recorder and then transcribed into Microsoft Word documents in order to be analysed. The interview period ranged from half an hour to two hours. The transcriptions were sent to respondents to check for accuracy (though in most cases they declined to do this), in order to increase validity and reliability. Most farms were visited and photographed (except in two cases where access was refused on the grounds of non-availability of buyers, and in one case where the buyer failed to turn up).

The principle of theoretical saturation was used in the determination of the number of cases to include in the case study: as many cases and perspectives as possible were included up to a point where minimal new information was provided with the inclusion of more cases (Eisenhardt, 1989:545). This amounted to eleven cases in the Western Cape (five cases in extensive farming areas and six in intensive farming areas). Thereafter the study was expanded to include farms from other Provinces in the country as depicted in Figure 3. This resulted in five more cases within the Mpumalanga, Limpopo and KwaZulu-Natal Provinces. Overall, theoretical saturation was reached after 16 cases. The data was collected over a period of four months.

Figure 3: Location of farms included in case study



Source: (Western Cape Department of Agriculture, 2008).

A data base was created to store all data collected and procedures followed in the case study. Data was either stored electronically (valuation reports, transcriptions of interviews and photos) or in hard copy (in the case of confidential valuation reports), while procedures followed were documented (e.g. time, place and order in which interviews were undertaken). This case study data base is a formal amalgamation of all evidence and assists in increasing the reliability of the research by providing a chain of evidence (Yin, 1984:96). The objective with such a data base is to arrange, categorise and document the data collected to assist in management of cases and to make the primary evidence generated in the study available to other researchers (Yin, 1984:92-93). The case study data base and protocol is provided in Annexure 3, Annexure 7 and Annexure 8.

3.3.1.4 Data analysis

Interviews and valuation reports were transcribed as Microsoft Word documents and coded with assistance from Computer Assisted Qualitative Data Analysis Software (CAQDAS) in the form of the Atlas.ti computer package (see Annexure 9 for an example of the Atlas.ti interface). CAQDAS such as Atlas.ti is based on the principle of Code-and-Retrieve (Wildschut, 2006:4). Coding describes the action of attaching keywords to text segments, thereby “distilling” it to its essentials (Henning, 2004:130). The codebook containing selected examples are provided in Annexure 10. While CAQDAS helps in organising, managing, categorising and supporting the process of data analysis, the interpretation of data is left to researchers (Carvajal, 2002:1). After the data is coded, themes, patterns, relationships and connections within and between categories must be identified through the building of networks, code families, tables and matrixes (Coffey and Atkinson, 1996:26).

In Atlas.ti, functions such as word counts, networks, code families and densities were used to facilitate analysis. Word counts entailed the counting of coded words or phrases and were useful for discovering patterns and themes. Atlas.ti does not take the context within which these words were used into account and only helps with the identification of important constructs (Ryan and Bernard, 2000:776-777). Networks can be created in Atlas.ti, which connects themes, codes and code families. These links are counted in a similar way as with the word count function and are referred to as code densities. For instance, a theme, code or code family that is central to the analysis and understanding of the phenomenon would have a high density count (see Annexure 11 and Annexure 12 for examples of networks and density results).

Analysis and interpretation thus imply that data is taken out of context and then re-contextualised by putting it together in a new way with the aim of discovering regularities, irregularities and patterns that appear across data when formal links are created between, for example, codes and themes (Henning, 2004:129; Tesch, 1990:63). The advantages of using CAQDAS such as Atlas.ti are that these packages are flexible and can handle large amounts of data that aid complex analysis. It is, however, easy to lose touch with the data when de-contextualised. CAQDAS can also be used for “quick and dirty” analyses that might look impressive, but make no contribution to a research topic (Wildschut, 2006:5).

The predicted pattern that valuers used traditional, known attributes which related to agricultural production when valuing farms bought for lifestyle purposes was compared with the observed pattern emerging through analysis of valuation reports and interviews. Codes, word counts and densities, as well as themes (value attributes of farms) and networks as identified from valuation reports² were contrasted with the perspectives (themes) identified by buyers. The perspectives of other respondents such as the seller and estate agent (other parties involved in the transaction) contributed to the development of a rich theoretical framework.

Similarities, differences, relationships and patterns within and across cases were identified and assisted in building the hypothesis that the interpretation of the value attributes of farms as identified by lifestyle buyers of agricultural properties differs from that of valuers, who tended to use traditional production oriented attributes, because these attributes were known, whereas lifestyle attributes were subjective and difficult to estimate in monetary terms. The analysis in this research was exploratory in the sense that attributes associated with lifestyle buyers were identified, but only tested later during the quantitative phase. However, the results stem from the empirical data generated in the cases and were thus grounded in the data.

Triangulation is used to confirm findings and serves to validate qualitative data. In this research a variety of sources, such as valuation reports and personal interviews with valuers, buyers and other parties involved in lifestyle transactions were incorporated for data triangulation purposes. Similarities among buyers and among valuers separately, as well as differences between valuers and buyers when put together were used to test the hypothesis and triangulate findings. In this way the

² Although all valuers were interviewed, their valuation reports were used as the main source of evidence (their interpretation of the attributes important on the property valued). In cases where the interpretation of valuers as stated in interviews differed from their valuation reports, the latter were given more weight, because these reports are official documents that must be defensible in the courts.

lifestyle buyer phenomenon was examined from different angles, which provided additional, in-depth and more complete information for a better understanding of the thought processes of lifestyle buyers. Furthermore, the inclusion of sixteen cases countrywide (the only common factor being that properties were bought for lifestyle reasons) where the different parties involved in transactions were interviewed and valuation reports scrutinised ensured the testing (confirmation or rejection) of the hypothesis through independent measurement processes, which assisted in decreasing uncertainty. In order to further confirm the qualitative findings, investigator triangulation was undertaken during the data interpretation phase, where the “new” attributes identified through analyses of interviews with buyers (and sometimes other parties, especially where sellers also purchased the property for lifestyle reasons) were sent to five selected and experienced valuers.

The results of the case study are discussed in Chapter 4. The case study results were used in the development of a questionnaire. The questionnaire (see Annexure 14 for the survey questionnaire) was sent to an expert panel consisting of four agricultural land valuers in order to increase reliability and construct validity through investigator triangulation. The results were also sent to two selected valuers who were part of the case study for similar reasons, as well as to the statistician involved in the quantitative phase that followed. Their suggestions were included in the survey questionnaire.

3.3.2 The quantitative method: a survey approach

In the quantitative phase the questionnaire developed in the qualitative phase was used in a survey to landowners of agricultural properties in two homogeneous farming areas in the Western Cape Province of South Africa, as classified by the provincial Department of Agriculture in the Western Cape. The purpose of the quantitative phase is to confirm the findings reached in the qualitative phase in order to provide more support to these findings. In this way between-method triangulation, where a qualitative and quantitative method are used together to validate and complement each other, could be achieved. The combination of the results of the qualitative and quantitative phases provides a comprehensive picture of the phenomenon being studied and these results are furthermore scrutinised for convergence, which provides additional validation of the qualitative data.

Once more is known regarding the characteristics of farms that appeal to lifestyle buyers, and this is subjected to quantitative testing for confirmation, valuers would be able to make agricultural

valuations with more certainty and firmness. The question and hypothesis guiding the quantitative phase are provided below:

Question:

Is there a difference between the value attributes of farms as interpreted by production oriented buyers (farmers) and lifestyle oriented buyers?

Hypothesis: There is no difference between the value attributes as interpreted by production- and lifestyle-oriented buyers. The alternative hypothesis is that there are differences. These differences can be statistically verified with appropriate statistical analyses.

The survey was done within an intensive and extensive area of the Western Cape Province, South Africa. These areas were identified using the Western Cape provincial Department of Agriculture's Area Development Plans (Streeksontwikkelingsplanne) (Departement van Landbou Wes-Kaap, 1999; Wiid and Le Roux, 1999), where homogeneous farming areas for the Province are described. The following section discusses the two areas in which the survey was implemented and then proceeds with an explanation of the sampling done and the data collection and analysis procedures followed.

3.3.2.1 Intensive area

The intensive area is situated with the Cape Winelands District municipality (formerly known as the Boland) and consists of the Stellenbosch and Paarl Registration Divisions (RDs) which overlaps with the Stellenbosch and Drakenstein local municipalities. Major towns within this area include Stellenbosch, Paarl, Franschhoek and Wellington, with Somerset West just falling outside the boundaries to the south.

This area is positioned within a winter rainfall area, with approximately 80 percent of rainfall in winter and the remainder in summer. Mountains make up 51 percent of the area, and affect the rainfall pattern. These mountainous areas receive the most rain (1000 to 1200mm per year in Jonkershoek mountains near Stellenbosch, up to 600 to 800mm per year in the Paarl area) and influence the climate by determining inflow of sea air to agricultural areas (especially vineyards) as well as the prevailing routes of damaging winds. Most rivers originate in these mountains and the water is of a high quality. The bulk of agricultural land is situated next to the rivers. The mountains also attract buyers for their aesthetic beauty and views, coupled with the prestige of owning a wine

farm (Elsenburg Landbou-ontwikkelingsinstituut vir Winterreëng gebied, 1990:5-7). The picturesque Franschhoek valley and world renowned Stellenbosch wine region are situated in this area.

The Boland region is characterised by a good infrastructural network, and is in close proximity to industrial areas and harbours, as well as the City of Cape Town and Cape Town International Airport. This also makes it attractive from a “city farmer’s” perspective. Both dryland and irrigated agricultural enterprises are pursued, with the main enterprises being wine grapes, wheat and pastures on dryland, and wine and table grapes, fruit (apples, pears, peaches) and vegetables on irrigated lands. Many wine cellars and wine routes are found, as well as some livestock farms and broiler chicken farms (Elsenburg Landbou-ontwikkelingsinstituut vir Winterreëng gebied, 1990:10).

The Area Development Plan identified 20 homogeneous farming areas within the region with a similar climate, soil structure and farming enterprises. The following farming areas are situated within the study area: Hottentots-Holland (Stellenbosch and Somerset West, as well as Kuilsrivier), Eersterivier (Stellenbosch central, with mountains), Franschhoek/Simonsberg, Drakenstein-Groenberg (Limiet Mountains, Wellington), Bergrivier-Paarl and Agter-Paarl-Paardeberg. (Elsenburg Landbou-ontwikkelingsinstituut vir Winterreëng gebied, 1990:7).

The Hottentots-Holland and Eersterivier areas are situated close to sea, with moderate temperatures and predominantly granite soils. Not much irrigation water is available, and farmers are dependent on mountain streams, fountains and dams. Viticulture is the most important agricultural enterprise, which benefits from the moderate sea breeze. Race horse studs are found closer to the coast (Elsenburg Landbou-ontwikkelingsinstituut vir Winterreëng gebied, 1990:20).

The topography in the Franschhoek/Simonsberg area varies substantially, thus the climate also varies. Winters are moderate, with hot summers (and high evaporation). The climate is suited to wine grapes, and mostly irrigated vineyards and orchards (plums, peaches) are found, but many vineyards are old, and the establishment of new vineyards and orchards is costly, with a low resource production potential. High land prices united with high production costs result in low profit margins. For this reason the farms are small (Elsenburg Landbou-ontwikkelingsinstituut vir Winterreëng gebied, 1990:35-36).

The Drakenstein-Groenberg, Bergrivier-Paarl and Agter-Paarl-Paardeberg have hot, dry summers, and wine grapes are the most important agricultural enterprise. Lately farmers have started to plant olive groves in these areas. The Drakenstein-Groenberg area is known for its strong winds that can

damage crops, while limited irrigation water is available. The production potential is low to marginal, and long-term crop farming is risky, with choices limited to less profitable cultivars. The high summer temperatures here and in the Bergrivier-Paarl area are not conducive to premium wine cultivars. Limited irrigation is available at high capital cost. Dryland wheat and wine grapes are the most important enterprises in the Agter-Paarl-Paardeberg area (Elsenburg Landbou-ontwikkelingsinstituut vir Winterreëng gebied, 1990:25, 39, 42-44).

3.3.2.2 Extensive area

The extensive area falls within the boundary of the Central Karoo District Municipality and includes the local municipalities of Beaufort West, Laingsburg and Witzenberg and the major towns of Beaufort West, Laingsburg, Touwsrivier and Ceres. These areas, also called the Great Karoo and Ceres Karoo, are classified as semi-arid or arid, with a low and highly variable rainfall coupled with sporadic droughts. In the Ceres-Karoo the rainfall varies between 50 to 400mm per annum, and in the Great Karoo it fluctuates between 95 to 225mm per year. Most rain falls during winter, but the total rainfall can occur at any time. There is substantial variation in the day and night temperatures (Wiid and Le Roux, 1999:5).

The Ceres-Karoo is divided into four production units: the Swartrug (mountainous), the Tankwa (rolling hills with little groundcover), Koedoesberg-Karoo (fair mix of grazing veld) and the Ceres Karoo. Minimal crops can be planted, because of the variable rain and absence of irrigated water, although some private dams do occur. A variety of soils are found, but are threatened by salinity.

The Great Karoo consists of the Moordenaarskaroo, Koup, Traka, Rietbronvlakte and Nelspoortrante. The landscape is relatively level, with a few mountains and high edges. The vegetation consists mainly of karoobossies, with very little grass.

Both the Ceres Karoo and Great Karoo (Beaufort West, Laingsburg regions) are mostly suitable for extensive agricultural practices related to natural grazing. The carrying capacity ranges from 45 to 140 hectares per large stock unit (LSU). The main agricultural enterprises are small stock farming with sheep for both wool (angora farming on the Rietbronvlakte in Great Karoo) and meat (“karoo lamb”) purposes. However, ostrich and especially game farming are alternative land uses that have increased substantially over the past ten years. Commercial game farms for trophy and meat hunting, as well as for tourism purposes such as guest houses/farms, farm stalls, hiking and 4x4

trails are becoming popular. The area is known for its wide open spaces, unique vegetation and old houses with a specific building style on some farms (many farms do not have electricity). The main road network that links the southern parts of the country with the northern parts (N1 highway) goes through the middle of the Great Karoo.

In general the grazing land is in a bad condition as a result of overgrazing and improper management practices. Even with good management practices and rehabilitation, extensive recovery periods are needed. Other impeding factors are small sizes of farms, limited grazing knowledge of farmers and small stock predators such as jackal and lynx. Alien vegetation (such as *Prosopis Glandulosa*) is a common problem in riverbeds (Wiid and Le Roux, 1999:22-23).

3.3.2.3 Survey procedures

Buyers of farms within the two areas were surveyed. These buyers were identified from the national Deeds Office data base (administered by the Department of Land Affairs) of transferred properties from January 2005 to October 2007. Only properties zoned as agricultural were included. The Deeds Office data are arranged according to Registration Divisions (RDs). For the intensive area data on properties in the RDs of Paarl and Stellenbosch were requested, while data on properties in the RDs of Beaufort West, Laingsburg and Ceres were requested for the extensive area. The data provided included buyers' and sellers' names as well as details of the property (farm name, number and portion, size).

Only arms' length transactions of properties greater than 5ha in the intensive area and 100ha in the extensive area were targeted to avoid the inclusion of properties for which the determination of HBU is more certain (survey focus was on properties where HBU could be either lifestyle or agricultural production purposes, thus farm size had to be conducive to both uses). These conditions led to a substantial reduction in the number of respondents. In the case of Stellenbosch, for example, approximately 2700 transactions were recorded in the Deeds Office data base, but when the data was "cleaned" (removal of transactions less than 5ha and other use properties - for some reason a fair number of industrial properties was included in the agriculturally zoned data base - double entries - sometimes one person would buy three sections of the same farm that would be recorded as three transactions - and non arms' length sales) only 58 usable transactions were left.

Deeds Office data do not provide any contact details for buyers and sellers of transferred properties, only the name in which the property is registered. The next step thus involved finding all the buyers of arms' length transactions to include them in the survey. In most instances the RDs correspond with borders of the local municipalities and local as well as district municipalities were approached to ask for buyers' contact information (or any other party that could lead to the buyer). All property sales need to be issued with clearance certificates by the relevant municipality, while property taxes of agricultural properties are administrated by local municipalities. For this reason the local municipalities were the obvious starting point for acquiring contact details of respondents. Most local municipalities did not want to release clearance certificates or did not have them available. Municipal address lists were only marginally useful (in many cases either outdated or incorrect). For some transactions no information was available, although they fell within the local or district municipality boundaries.

This was further complicated by the fact that many properties were registered in the name of a company, trust or closed corporation (CC) with no indication of an appropriate contact person. Hence it was a long and arduous process to determine the contact details of buyers - they had to be contacted personally to explain the purpose of the study and to determine the most suitable survey administration method (e.g. e-mail, mail or fax). Personal contact was expected to increase the response rate. The Companies and Intellectual Property Registration Office website of the Department of Trade and Industry (www.cipro.co.za) contained information (names and addresses of representative lawyers or auditors) on some of the companies and CCs, which could be followed up to trace the buyers. All leads were followed up to gain access to buyers, including telephone directories, informants within municipalities and selected people within these communities (especially the extensive area).

Buyers or representatives of companies, CCs and trusts were then contacted telephonically to inform them of the survey and to ask permission to send them a questionnaire via a communication form of their choice, after which a cover letter and the questionnaires were sent out (see Annexure 14 for cover letter and survey questionnaire). This was followed up by two telephonic reminders three weeks apart and a final electronic reminder. All in all four contacts were made with respondents over a period of approximately three months.

A number of problems were encountered in the quantitative phase, of which non-participation was the most disappointing. Several respondents did not want to participate as they were suspicious that the survey would be used as leverage to increase municipal property rates. In some instances there

was a considerable lag between the purchase date of the property and the capturing date within the Deeds Office data base (as a result of various delays, such as in transfer). A few of the properties had been sold again in the period between January 2005 and October 2007 and sellers (although being buyers shortly before) did not see the point in completing a questionnaire on a property that they had already sold in the meantime. The detailed nature of the questionnaire was not conducive to inclusion of transactions dated further back, because possible respondent recall failures were expected.

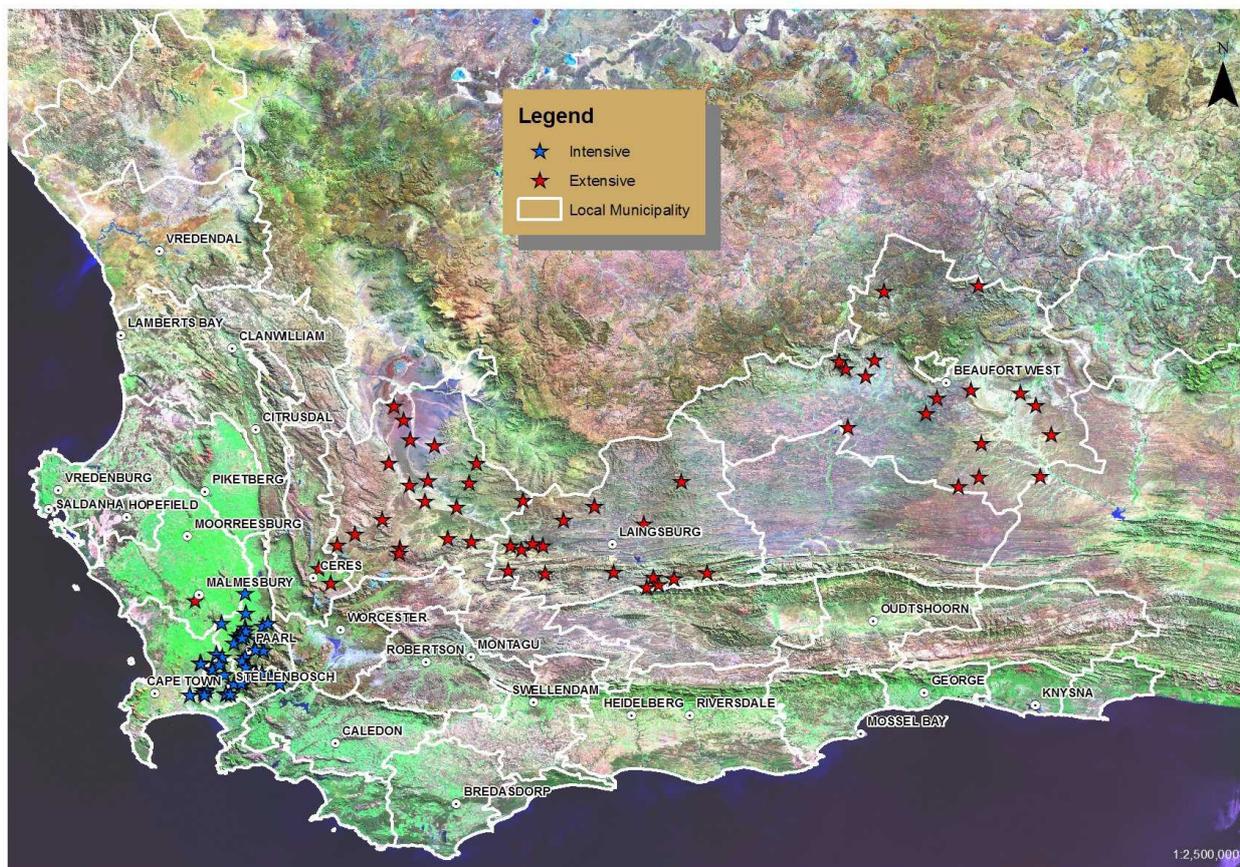
A total of number of 290 questionnaires was sent out (181 in the intensive area and 109 in the extensive area), while 123 were returned (64 within the intensive and 59 in the extensive area). The response rate was 35 and 54 percent in the intensive and extensive areas, respectively. After consultation with an expert statistician it was decided that attempts to increase the response rate by using transactions further back in time would be counter-productive, as a substantial number of additional responses would only be marginally beneficial for statistical analyses, which did not justify the time and effort. The detailed nature of the questionnaire could have lead to respondents' recall problems if transactions further back in time were included. Similarly, as is the case in most rural land markets, the markets in the study areas are small and diverse, which makes it nearly impossible to secure big samples (Holstein, 2003:40; Isakson, 2001:424; Kummerow, 2002:409 - 411; Thair, 1988:194-196). The location of respondents' farms is indicated in Figure 4

The questionnaire was organised into the following themes, in order to make it better manageable for respondents:

- position and accessibility, agricultural production potential
- topography
- water availability
- main and other residential units
- non-residential infrastructure
- other characteristics (associated with aesthetics)
- demographics.

These themes roughly follow the structure as presented in the literature and valuation reports.

Figure 4: Location of farms included in the survey of landowners in the intensive and extensive area of the Western Cape Province



Source: (Western Cape Department of Agriculture, 2008).

The data was captured in Excel spreadsheets and analysed statistically with STATISTICA software. The analyses included analysis of variance tests, factor analyses and regression analyses. The two areas were analysed separately, as they differed widely with regard to prevalent characteristics. The results are presented in Chapter 4.

3.4 Conclusion

The emergence of lifestyle buyers in the agricultural land market leads to a measurement problem for valuers, as the value attributes associated with these buyers are new and less concrete, and therefore less measurable. The complexity associated with agricultural property valuations where lifestyle considerations were present and the exploratory nature of the research made it well suited to a mixed methods strategy: the open-ended nature of qualitative research provided an opportunity for the identification of new, unanticipated considerations, which could then be tested quantitatively

through statistical analysis. A mixed methods approach focused on the strengths of both qualitative and quantitative methods in order to provide more solid and comprehensive results.

A sequential exploratory mixed methods design was followed, which consisted of a qualitative phase done as a case study (the core project), followed by a quantitative phase, done as a survey. Advantages of the case study approach such as the use of multiple data sources and in-depth investigations from different perspectives made it an obvious choice for the qualitative phase, while its methodological weaknesses were offset by the inclusion of a survey in the quantitative phase. The case study included 16 cases nationally and explored the phenomenon of lifestyle buyers of agricultural properties, and identified tentative relationships and variables associated with this type of buyer. The data was analysed with computerised data analysis software (Atlas.ti). Different forms of triangulation were used for improved reliability and validity. The qualitative findings (variables associated with lifestyle buyers) were then included in a questionnaire sent to land owners within two homogeneous farming areas in the Western Cape. These results are presented in Chapter 4.

4. RESULTS

4.1 Introduction

The need for a reinterpretation of the value attributes of agricultural land for the valuation of farms bought for lifestyle purposes was discussed in Chapter 1. The complex environment in which agricultural valuers operate, as well as the increased uncertainty in highest and best use decisions as a result of alternative land uses, such as for lifestyle purposes, was highlighted in the review of literature presented in Chapter 2. In Chapter 3 the procedures followed in the mixed methods research strategy to assess whether there was a difference between the traditional production value attributes used in the valuation of farms and these attributes as they appeal to lifestyle buyers, were outlined. A mixed method strategy was used because the open-ended nature of the qualitative method presented the opportunity to identify new and unexpected considerations of lifestyle buyers, while the quantitative method was used to substantiate the statistical significance of these identified considerations.

The results from the mixed methods strategy are discussed in this chapter. This is done by revisiting the hypotheses set out in Chapter 1 and connecting the qualitative and quantitative results to these hypotheses. To start with, the demographic profiles of lifestyle and production oriented buyers are contrasted, after which the hypothesis that the applicable value attributes considered by these types of buyers diverge is tested statistically by comparing their respective interpretations and considerations for purchasing an agricultural property. This is done separately for the intensive and extensive areas and matched with a likely profile of lifestyle buyers. This is followed by a discussion of the hypothesis that valuers apply mostly production related variables when valuing farms bought primarily for lifestyle purposes because of limited analysis of different buyer considerations in the choice of the HBU.

4.2 Demographic profile of buyers

Demographic information regarding lifestyle and production oriented buyers is supplied as background information in order to provide more clarity about these buyers. Contrasts and similarities between types of buyers facilitate a better understanding of the various motivations that drive them and could be used to draw up different profiles of buyers. The demographic information

of buyers in the intensive and extensive areas is discussed separately and a summary of selected information of both types of buyers in both areas are provided in Table 4.

Table 4: Demographic information of buyers in the extensive and intensive areas

Variable	INTENSIVE AREA			EXTENSIVE AREA			
	Lifestyle buyers	Production-motivated buyers	p-value*	Lifestyle buyers	Production-motivated buyers	p-value*	
Reside on property purchased (%)	54.05	30	0.08	6.67	25	0.05	
Grew up on a farm (%)	28.94	52.38	0.08	41.3	62.9	0.1	
Afrikaans as language of preference (%)	46.15	61.9	0.24	87.7	71.43	0.11	
Marital status: married (%)	84.61	90	0.56	93.33	85.71	0.34	
Citizens of South Africa (%)	86.84	76.19	0.3	93.33	100	0.1	
Gender: male (%)	76.97	90	0.2	96	89	0.15	
Mean age (years)	47	47	1	50	54	0.18	
Variable	Detail						
Highest qualification (%)	Matric certificate	27.59	24.14	0.58	23.33	42.3	0.08
	Diploma	20.69	13.79		16.67	19.23	
	B-degree	17.24	18.97		13.33	23.07	
	Post graduate degree	34.48	43.1		46.67	15.38	
Gross annual income** (%)	< R200 000	9.09	11.11	0.81	12	28	0.41
	R200 000 - R400 000	12.12	9.26		20	20	
	R400 001 - R600 000	12.12	14.81		12	16	
	> R600 000	66.67	64.81		56	36	
Occupation (%)	Business	70.58	28.57	0.00	53.33	29.62	0.01
	Professional	17.65	14.29		30	14.81	
	Agricultural	5.88	52.38		6.67	44.44	
	Government	0	0		3.33	3.7	
	Retired	5.88	4.76		6.67	7.41	
Main source of income (%)	Non-agricultural	91.89	15	0.00	93	46.43	0.00
	The farm purchased	5.41	40		0	17.86	
	Another farm	2.7	45		6.67	35.71	
Work position (%)	Work full-time	76.32	85.71	0.1	63.33	74.07	0.16
	Work part time	10.53	14.29		30	11.11	
	Retired	13.16	0		6.67	14.81	

* Marked effects are significant at $p < 0.05$ (according to analysis of variance).

** In terms of salary paid if income is earned from farming.

Note: Significant effects are in bold.

4.2.1 Intensive area

Approximately 65 percent of all respondents in the intensive area were motivated by lifestyle considerations and the remainder indicated that they had acquired the property primarily for farming purposes. The demographic profile of these buyers corresponded in most respects, possibly because of the area's location - its proximity to Cape Town and other major towns, extensive road networks and the attraction of the exclusivity of this wine producing region for farmers and lifestyle

buyers alike. Significant differences only manifested themselves with regard to their main source of income and occupation.

As expected, the majority (92 percent) of lifestyle buyers secured their primary income from non-agricultural sources and a mere 5 percent used the farm purchased for their main source of income, while 40 percent of production motivated buyers indicated that they depended on the farm purchased for their main source of income. While some 45 percent of production oriented buyers depended on another farm as main source of income, this figure was only 3 percent for lifestyle buyers.

More than half (52 percent) of production oriented buyers was employed within the agricultural sector, but only 6 percent of lifestyle buyers indicated occupations that were related to agriculture. Unsurprisingly, approximately 71 percent of lifestyle buyers were employed in the business sector, while a further 18 percent were professionals such as doctors, engineers and accountants. It is interesting to note that about 14 percent of production oriented respondents indicated professional occupations and 29 percent were employed in the business sector. If added together, about 43 percent of production oriented buyers had occupations outside of agriculture, which implies that many farmers in the intensive area also have other business interests.

Lifestyle buyers are usually high net worth individuals and it did not come as a surprise that 67 percent indicated an annual gross income above R600 000, while the average annual income was between R400 000 and R600 000 for both lifestyle and farming oriented respondents. Lifestyle buyers were highly qualified. Around 34 percent had completed a post graduate degree, while 17 percent completed a bachelor's degree and another 20 percent were in possession of a diploma. However, farming oriented buyers were even better qualified, with 43 percent in possession of a post graduate degree and 32 percent having either a diploma or bachelor's degree.

More than 75 percent of all respondents in this area were married men and the mean age for both lifestyle and farming oriented buyers was 47 years. This deviates from a study that compared seasonal and permanent homeowners' demographics in Wisconsin which found that seasonal homeowners were younger than their permanent counterparts (Clendenning *et al.*, 2005:10). Around 54 percent of lifestyle buyers used the farm purchased as primary residence, but this dropped to 30 percent for their production motivated counterparts. South Africans made up 87 percent of lifestyle buyers and 76 percent of production oriented buyers. Foreign buyers originated from the United

Kingdom, the USA, Germany and the Netherlands. Around 54 percent of lifestyle buyers indicated a preference for English, but this declined to 38 percent for buyers with production considerations.

4.2.2 Extensive area

Some 52 percent of buyers classified themselves as primarily lifestyle buyers. Most of these buyers were between the ages of 46 and 53, with an average age of 50. Production oriented buyers were slightly older with an average age of 54. Contrary to the situation in the intensive area, the majority of lifestyle buyers were Afrikaans speaking (87 percent) and 93 percent was South African citizens, while the remaining respondents were from the United Kingdom and the Netherlands. This is in line with a study done in France, where 5 to 10 percent of the market was held by foreigners (Agra Europe, 1990:1; Healy and Short, 1978:197). All buyers motivated by farming considerations were South African and approximately 71 percent was Afrikaans speaking. The harsh conditions typical of the Karoo are probably the main explanation for this, as many farmers were born in this area. Almost 90 percent of all respondents were male, while 93 percent of lifestyle buyers and 86 percent of farming focused buyers were married. This was expected, as most lifestyle buyers from the case study indicated that one of their primary considerations in buying an agricultural property was to spend time with family.

The majority of lifestyle buyers did not live on the farm purchased, but rather used it as a weekend or holiday retreat. Only 7 percent actually lived on the farm, and in all these cases the respondents were retired. Interestingly, most buyers who bought the farm for production purposes also did not live on the farm (75 percent): they lived either in town or on another farm. However, the difference between these types of buyers regarding the use of the property as primary residence was still statistically significant. One of the reasons driving the phenomenon of lifestyle buyers could possibly be attributed to a need people have to return to their roots, as about 41 percent of lifestyle buyers and a substantial 63 percent of farming motivated buyers grew up on farms.

In unison with the intensive area, lifestyle buyers were typically professional or business people, which also corresponded with the buyers interviewed in the case study who all held occupations unrelated to farming, with most being employed in the business sector. It follows that most lifestyle buyers were well educated – about 47 percent possessed a post graduate qualification, while a further 30 percent were in possession of either a bachelor's degree or diploma. Production oriented respondents held lower qualifications with about 42 percent in possession of a matriculation

certificate. Some 43 percent held either a diploma or bachelor's degree, but only 15 percent had studied at post-graduate level.

As expected, more than half (56 percent) of lifestyle buyers earned a gross income of more than R600 000 per annum; this decreased to 36 percent for production motivated buyers. The average gross income per annum for lifestyle buyers was between R400 000 and R600 000; this declined to between R200 000 and R400 000 per annum for production oriented buyers. The income of production motivated buyers was spread more evenly between the classes represented than that of lifestyle buyers. This corresponds with a study that compared the socio-demographic characteristics of seasonal homeowners with those of permanent residents and found that the former were wealthier and had higher education levels than the latter (Clendenning *et al.*, 2005:10).

None of lifestyle buyers' income originated from the particular farm bought; only 7 percent was derived from another farm, and 93 percent from non-farm income. This is in line with the confirmation of buyers interviewed during the case study stage that they were not dependent on the income from agricultural production on the purchased farm for their livelihood or to service mortgage bonds³. For this reason lifestyle buyers could afford to place more emphasis on non-productive characteristics of properties. This picture differed significantly for production oriented buyers, where 36 percent indicated that they were dependent on another farm for their main income, while 18 percent depended on the farm purchased for their livelihood. Interestingly, a substantial percentage of these buyers (46 percent) derived their main income from off-farm resources.

As with the main source of income, the difference of careers of lifestyle and production oriented buyers was statistically significant. This is expected, with most production motivated buyers involved in the agricultural sector (44 percent), but only 7 percent of lifestyle buyers operational in this sector. Therefore it was likely that lifestyle buyers viewed farms differently from farming motivated buyers. Most lifestyle buyers were businessmen (53 percent), but 30 percent of production oriented buyers also indicated careers related to the business sector. About 3 percent of both types of buyers were professional people.

³ Those who farmed as a hobby expressed the hope that their activities would cover the farm's running expenses. Hobby farming usually entailed extraordinary agricultural endeavours such as the growing of lavender, hoodia or indigenous flowers for niche markets.

In summary, the biggest differences were found in lifestyle buyers' orientation, these being independent of farming, as a result of other sources of income and careers outside the agricultural sector. Consequently buyers' level of income and education *per se* did not reveal much.

4.3 An interpretation of the value attributes considered by valuers in their valuations of agricultural properties used for lifestyle purposes

The hypothesis that valuers apply mostly farming related characteristics when valuing farms bought primarily for lifestyle purposes was explored in the qualitative phase. This consisted of a case study made up of 16 farms bought for lifestyle reasons. The extent to which valuers continued to use production oriented value attributes when valuing agricultural properties bought primarily for lifestyle purposes was investigated by comparing the value attributes identified by valuers in valuation reports and interviews, with those attributes identified by buyers during interviews. The qualitative phase was used as departure point and the findings were strengthened during the quantitative phase. In this way the benefit of synergy between qualitative and quantitative methods within the mixed methods approach could be maximised.

Even though functions available from the qualitative data analysis software (Atlas.ti) such as grounded and density word counts, networks and the query tool were used to investigate valuation reports and buyer interviews, analysis relied on the researcher's own interpretation and judgment. These analyses cannot be presented in a meaningful manner, because of the sheer volume of the data and its removal from its original context (selected examples are however presented in Annexure 11, Annexure 12 and Annexure 13). At the same time what people do not say is sometimes just as important as what they do say (e.g. omission of certain attributes forms an important indicator of valuers' and lifestyle buyers' interpretations), but this cannot be displayed.

From the valuation reports it was clear that valuers continued to use mostly traditional agricultural characteristics associated with production in their valuation reports and assumed the typical buyers of farms to be farmers, when valuing agricultural properties bought primarily for lifestyle purposes. Valuers undertaking valuations for commercial banks usually operate within time constraints, and they admitted that these institutions looked at the farm from the perspective of providing loans against limited exposure and risk. This meant that valuers had to be conservative in their approach and focused on attributes related to production (income), which could be substantiated with hard

facts and figures on a Rand per hectare basis, or the likely price paid by farmers as typical buyers, as they were reasoned to be the likely buyers of such properties.

Valuers concentrated on measurable characteristics and valuation reports were therefore dominated by attributes associated with agricultural potential. Valuation reports all included details of the farm (extent, deeds information, zoning, presence of servitudes), the current use, position in terms of access and proximity to the closest town, climate and rainfall, vegetation type, soil type and quality, water availability, topography, improvements (size and condition of residential and non-residential infrastructure) and services available on the property (roads, electricity). The characteristics that added value were listed and assigned a Rand per hectare value. For example, the extent of permanent crops (e.g. vineyards, orchards), dams, mountain land, dryland, irrigated land, sheds and residential units were listed and given a value, based on comparison with other agriculturally productive properties.

Valuers estimated an agricultural value for a property (based on average Rand per hectare values), which was then compared with estimates of market value as determined by comparative sales of farms in the region. Most comparable sales used were those of agriculturally productive farms. In valuation reports differences between market value and agricultural value were ascribed to lifestyle considerations, but no detail was provided. Market value was determined by adding a percentage or a lump sum to the estimated agricultural value and contributing that to lifestyle considerations. In selected cases the subject property was compared with farms where alternative uses were pursued, such as a guest house, game lodge or development of smaller exclusive units. Attributes such as river frontage and mountain views were mentioned, but these considerations were dealt with superficially. In other cases valuers included sales of smallholdings or smaller properties as comparative sales in order to justify high market values (even if farms were substantially bigger). This avoidance of lifestyle attributes or vague descriptions left valuers in a vulnerable position, as they struggled to balance agricultural and market value based on market sales comparisons. In addition, this did not resemble the thought processes of lifestyle buyers.

During interviews with valuers, however, it became evident that they were aware of lifestyle considerations as the possible HBU for agricultural properties, but attributes were in general difficult to substantiate in monetary terms. The use of market sales comparisons with similar lifestyle properties was extremely difficult, as lifestyle attributes were diverse, subjective and unique to each property. While the agricultural potential of farms took prime position in valuation reports, dominated by production related concepts such as functionality of infrastructure, carrying

capacity, climate, water rights and suitability of land for agricultural crops, interviews with valuers revealed details of lifestyle attributes such as the presence of natural scenery, views, river frontage and trees, as well as recreation or leisure opportunities of properties. A property's proximity to cities, towns and major roads was important and relatively easy to establish, and valuers indicated that the location of properties in terms of being exclusive (status) and secluded, and a setting within a valley and against a mountain was also considered to be important.

It is essential to note that most valuers commented that lifestyle buyers viewed farms as exclusive residences and the prices of these properties were realistic and attractive when compared with other exclusive properties such as beach properties.

Buyers, on the other hand, focused primarily on lifestyle potential rather than on agricultural potential. Factors such as the aesthetic value of the property's main residence and buildings relating to historic character and typical style, as well as location (easy access and proximity to major cities and airport and the setting of the property) were important. The property's suitability for outdoor recreation and leisure activities and accommodation capacity for entertaining friends, family or tourists (for income purposes) were emphasised. The tranquility, rural setting and availability of space associated with agricultural properties were also important, as was other aesthetic characteristics, such as the presence of natural scenery, trees and views.

Some characteristics associated with agricultural production and included by valuers were also important to buyers, but for different reasons. The availability of water, such as dams and rivers for recreation activities such as canoeing and fishing, as well as for aesthetic purposes was attractive to buyers, but could also be used for production purposes. At the same time the topography, aspect, climate and type of vegetation are important indicators of the agricultural potential of a property, and these characteristics were also important to buyers for aesthetic reasons.

The process of analysis hinted at the fact that valuers focused predominantly on the productive aspects of agricultural properties bought for lifestyle purposes as these attributes were measurable and familiar to them, and that the considerations included in valuation reports related more to those emphasised by production oriented buyers than lifestyle buyers. The conclusion that the emphasis of the attributes of farms as interpreted by valuers and buyers differed was investigated further in the quantitative section.

4.4 Considerations of buyers in their decision to purchase farms

The hypothesis that the applicable value attributes of agricultural properties as interpreted by lifestyle motivated buyers diverge from those considered important by buyers who are primarily production oriented was explored quantitatively through statistical analyses of the survey data. The strength of the qualitative method lay in its unrestricted and unlimited exploration of new considerations for purchasing farms. The aim of the qualitative phase was to identify new considerations associated with lifestyle buyers, while the objective of the quantitative phase was to determine the prevalence of these considerations. For this reason the statistical analyses compared the considerations of lifestyle motivated buyers and production oriented buyers of farms in order to determine where these interpretations converged and deviated. Analyses of variance, regression and factor analyses were used, supplemented by qualitative data. The results could be used by valuers in the valuation of properties where lifestyle attributes are present.

Respondents were asked to rank the importance of specific characteristics of farms on a scale of one to ten, in terms of what they initially wanted when looking for a property to purchase, and then whether the property acquired satisfied these requirements. Respondents were then required to label themselves as either lifestyle oriented or production oriented in order to investigate how value attributes related to the buyer category chosen by respondents. All analyses depended on this classification and for improved measurement purposes two questions were asked about respondents' purpose for buying the farm (Question 52 and 53 of the survey questionnaire – see Annexure 14). A univariate test of significance indicated that respondents' answers to these questions were consistent and that the questions did indeed measure the purpose for buying the farm.

The intensive and extensive areas differ widely and for this reason analyses were done and are presented separately. It is important to note that the number of respondents for the intensive (63) and extensive area (59) in most instances differ from the number of observations (n) used in the various statistical analyses discussed in sections 4.4.1 and 4.4.2, due to missing values (i.e. where respondents completed the questionnaire but failed to answer a specific question which was then omitted from inclusion in the analysis done).

4.4.1 Intensive area

The intra-correlation co-efficiency for agreement and consistency was used to determine to what extent the specific attributes sought by respondents were satisfied by the particular property bought. In order to do this, the (A) part of questions (asking the importance of a given characteristic in respondents' choice of an agricultural property *in general*) was compared with the (B) part (asking to what extent the *particular* property bought satisfied their need for the given characteristic). This was done for questions 1 to 50 (except for questions 39 and 42, where the (B) and (C) part was used, while question 31 was not used). In general buyers were satisfied that they got what they were looking for when buying a farm, with the exception of the need to be able to keep game with game fencing in a suitable condition, as well as the need for electricity. The carrying capacity of veld in the intensive area is low and therefore does not provide a favourable habitat for game, hence the absence of game fences. It is possible that buyers would have liked game fences for improved security purposes. Buyers' dissatisfaction with the provision of electricity is difficult to explain, as most farms in the area have electricity because of their close proximity to major towns and the intensive nature of farming activities. At the time of the survey South Africa was experiencing a power crisis, which could have influenced respondents feeling that they did not get sufficient power supply.

The mean and median scores of variables as assigned by lifestyle and production oriented buyers provided an indication of the importance of these variables to either or both types of buyers (see Annexure 15 for the list containing the mean and median scores of questions 1 to 30 and 32 to 50 (the (A) part of each question, except for questions 39 and 42 where the (B) parts were used) that indicated the importance of variables according to each type of buyer). It was anticipated that some variables would be important to both lifestyle and production motivated buyers, as some lifestyle buyers interviewed in the case study indicated that even though they were not dependent on the farm purchased as their main source of income, they were nonetheless interested in pursuing some type of farming activity either for recreation or income purposes. The mean and median scores indicated that selected characteristics associated with production, such as meso climate, soil quality, size and infrastructure was important to both types of buyers. Buyers wanting to produce wine for either lifestyle or production reasons were interested in characteristics related to the *terroir* of the area, including the property's locality, climate, topography and soil quality. In a study determining the priorities of buyers regarding the value contributing characteristics of agricultural land in the Stellenbosch district, it was confirmed that buyers (including lifestyle buyers) were cognisant of *terroir* (Kleynhans and Opperman, 2005:496).

Water availability for human and animal consumption, as well as the presence of irrigation infrastructure was also important for both lifestyle and farming oriented buyers (high mean and median scores), as water remains a scarce and needed resource. Many lifestyle buyers keep horses for recreation purposes. It is interesting to note that the lifestyle buyers interviewed during the case study in the intensive area all wished to continue existing intensive farming activities such as the production of wine or fruit.

The results from selected hedonic pricing studies validate these findings, where factors such as climate (Maddison, 2000:519; McGranahan, 1999:2-8) and soil quality (Dunford *et al.*, 1985:10; Feng *et al.*, 1993:356; Huang *et al.*, 2006:458; Kennedy *et al.*, 1997:5; Livanis *et al.*, 2005:39; Maddison, 2000:519; Schott and White, 1977:427; Vasquez *et al.*, 2002:69) and size (Chicoine, 1981:353; Dunford *et al.*, 1985:10; Feng *et al.*, 1993:356; Guiling *et al.*, 2007:18; Huang *et al.*, 2006:458; Kennedy *et al.*, 1997:39; Reynolds and Regalato, 2002:182; Schutjer and Hallberg, 1968:572; Shonkwiler and Reynolds, 1986:58) affected the price paid for agricultural properties in rural areas, as well as properties located at the urban fringe and properties with amenity characteristics. The significance of functional infrastructure such as barns (Feng *et al.*, 1993:356) and the presence of a house (King and Sinden, 1988:242; King and Sinden, 1994:38) for agriculturally motivated buyers was demonstrated. The contribution of total improvements (Bastian *et al.*, 2002:337; Maddison, 2000:519; Reynolds and Regalato, 2002:182; Spahr and Sunderman, 1999:227) and style of the residential house (Paterson and Boyle, 2002) towards the price of agricultural properties used for lifestyle purposes was also noteworthy.

The importance of water availability for irrigation and related infrastructure is in line with the results from other studies undertaken (Bastian *et al.*, 2002:337; Drozd and Johnson, 2004:294; Guiling *et al.*, 2007:15-17; Lopez *et al.*, 1994:53). At the same time studies illustrating the importance of the presence of water on properties, such as river frontage, wetlands and other water surface areas for aesthetic and recreation purposes abound (Arriaza *et al.*, 2004:115-116; Chicoine, 1981:353; Guiling *et al.*, 2007; Henderson and Moore, 2006:597; Inman *et al.*, 2002:72; King and Sinden, 1994:38-39; Kline and Wichelns, 1998:211; McGranahan, 1999:3-5; Paterson and Boyle, 2002:417; Pope and Goodwin, 1984b:37; Pyykkonen, 2005:18; Reynolds and Regalato, 2002:182; Thompson, 2003:328-330).

Electricity was important for both types of buyers, as farmers needed it for production, while lifestyle buyers often used the agricultural property purchased as their main residence. Both lifestyle

and production oriented buyers favoured properties situated within close proximity to major cities, towns and roads for easy access to markets or businesses and to decrease traveling time. This was expected, as both buyers and valuers emphasised the location of properties in terms of accessibility, proximity to towns and other amenities (e.g. schools) as a significant consideration. Evidence from the literature validates the statistical significance of agricultural property's accessibility and position in terms of distance to cities and towns as prime considerations of buyers (Bastian *et al.*, 2002:337; Chicoine, 1981:353; Dunford *et al.*, 1985:10; Feng *et al.*, 1993:356; Henderson and Moore, 2006:597; Huang *et al.*, 2006:458; Kennedy *et al.*, 1997:39; King and Sinden, 1988:242; King and Sinden, 1994:38; Livanis *et al.*, 2005:39; Lopez *et al.*, 1994:53; Pope, 1985:81; Reynolds and Regalato, 2002:182; Schutjer and Hallberg, 1968:572; Shonkwiler and Reynolds, 1986:58; Shrestha and Alavalapati, 2004:763; Spahr and Sunderman, 1999:227).

The secluded location of the property was alluring for lifestyle buyers because of the peace and quiet offered, while additional security was guaranteed because of limited thoroughfare. Production oriented buyers preferred privacy for the same reasons. The appeal of privacy for lifestyle buyers was confirmed in the literature (Thompson, 2003:328). The 'address' of a property was important for production oriented buyers, because of the premium it places on their produce (e.g. wine label), while lifestyle buyers enjoyed the status associated with a specific address.

4.4.1.1 Analysis of variance

An analysis of variance was carried out in order to differentiate between the characteristics valued by lifestyle and production oriented buyers. In other words, analysis of variance enables a person to tell apart those variables that are preferred by lifestyle and production oriented buyers respectively. The purpose of the analysis of variance was to identify variables where lifestyle and farming oriented buyers differed significantly, by comparing continuous response variables (as per the (A) section of questions 1 to 30, and questions 32 to 50, except for questions 39 and 42, where the (B) section was used, which was an expression of the importance of the specific characteristic in the buyer's purchase decision) with categorical input variables (respondents' reason for purchasing the farm, as per question 52 – see Annexure 14 for the survey questionnaire). These results are presented in Table 5.

Tests for the homogeneity of variance and tests for normality of the residuals were done. If residuals were not normally distributed then a Mann-Whitney U test was done as for non-parametric

data. The level of the p-statistic (p-value) provides the probability of observing the observed statistic or a more extreme value given that the null hypothesis is true. If the value is very low, in other words less than the stated significance level of 5%, then it is regarded as sufficient evidence that the null hypothesis cannot be true. The Z-test (also called test statistic) is used in inference which determines whether the difference between the means of two groups is large enough to be statistically significant (in this case Z-adjusted scores above |2| were indicative of statistically significant differences between the importance of these variables for lifestyle and production motivated buyers). For this reason variables for which the p-values were smaller than 0.05 (which corresponded with the Z-adjusted scores specified) indicated that there were statistically significant differences in the importance of these variables as perceived by lifestyle and production oriented buyers.

Eleven variables where lifestyle and production oriented buyers differed significantly were identified. These included variables that did not contribute towards agricultural production, such as a setting against a mountain and in a valley, as well as the presence of views, trees and natural scenery for aesthetic purposes, together with the possibility of outdoor and water recreation activities and the accommodation capacity of other residential units. These results correspond with selected studies that explored amenity variables where tree cover and vegetation (Arriaza *et al.*, 2004:115; Clendenning *et al.*, 2005:3-5; Paterson and Boyle, 2002:317; Pope, 1985:81; Schutjer and Hallberg, 1968:572-573; Shrestha and Alavalapati, 2004:763; Spahr and Sunderman, 1999:227), views (Bastian *et al.*, 2002:337; Bourassa *et al.*, 2004:1427; Nickerson and Hellerstein, 2003:129; Pope and Goodwin, 1984a:750; Spahr and Sunderman, 1999:227; Thompson, 2003:328) and natural scenery within a particular setting were emphasised (Inman *et al.*, 2002:72; Kleynhans and Opperman, 2005:496; Nickerson and Hellerstein, 2003:129; Pope, 1985:81; Spahr and Sunderman, 1999:227; Thompson, 2003:328). Likewise, production oriented buyers focused on attributes such as the agricultural potential and soil quality, as shown in the literature (Feng *et al.*, 1993:356; Huang *et al.*, 2006:458; Kennedy *et al.*, 1997:4-20; King and Sinden, 1994:38; Maddison, 2000:519; Schott and White, 1977:427; Vasquez *et al.*, 2002:69).

While the property's location in terms of distance to the nearest town was important for both types of buyers and also noted in the literature, lifestyle buyers indicated a higher preference for this attribute (as indicated by a median score of 9 (out of a possible 10) assigned by lifestyle buyers, compared with a median score of 7 by production oriented buyers – see Annexure 15). Lifestyle buyers living on farms usually need to be within reasonable distance to towns and cities, as well as have easy access to an airport for work/business purposes. On a different level, properties with easy

access and close to airports and towns are attractive to tourists, as well as family and friends of buyers, or buyers themselves who might live abroad. This could account for the high priority given to the accommodation capacity of other residential units by lifestyle buyers, while not being important to production oriented buyers. The accommodation capacity of residential units did not feature strongly in the literature, with only one study in South Africa exploring this in more detail (Kleynhans and Opperman, 2005:496).

Table 5: Variables that differ significantly between lifestyle and production oriented buyers: intensive area

Variable	Z	p-value*	Z adjusted
Location: distance to nearest town	3.21	0.00	3.31
Location: distance to nearest airport	2.48	0.01	2.52
Location: setting (in valley, against mountain)	3.14	0.00	3.21
Agricultural production potential in general	-3.01	0.00	-3.03
Agricultural production potential: soil quality	-2.97	0.00	-3.01
Accommodation capacity of other residential units	2.06	0.04	2.08
Aesthetics: presence of natural scenery	1.98	0.04	2.06
Aesthetics: view from the property	3.43	0.00	3.57
Aesthetics: presence of established trees	2.15	0.03	2.19
Outdoor recreation activities	2.28	0.02	2.30
Availability of water for recreation	2.61	0.01	2.65
n = 59 (39 lifestyle, 20 production)			

* Marked effects are significant at $p < 0.05$.

These results are similar to the outcomes of the qualitative analyses, where the agricultural potential of the land was not the most important factor for lifestyle buyers interviewed, but properties appealed to them mostly because of their aesthetic value. Attributes such as the presence of natural scenery, mountains and streams, together with views from the property and its setting, as well as the distance to amenities and suitability for family and friends were emphasised by buyers in the qualitative phase. Some production oriented attributes were also important to lifestyle buyers, but for aesthetic reasons (e.g. the availability of water for its beauty and recreational activities). During the case study interviews, many buyers remarked that the property they bought was “priceless” in the sense that they could not manufacture, replicate or substitute what the farm offered in terms of natural beauty or cultural heritage.

4.4.1.2 Multiple regression analysis

Regression analyses were used to determine which continuous characteristics of farms best explained whether an agricultural property would be attractive for lifestyle or production oriented buyers. In other words, the purpose of the regression analyses was to establish statistically which variables (characteristics) were most likely to be associated with each type of buyer. Regression analysis is done to identify relationships between independent (or predictor) variables and a dependent variable. The dependent variable was respondents' reason for buying the property (as per questions 52 and 53 which were used separately as explained in the following paragraph), which was regressed against the independent variables that consisted of the characteristics sought by respondents in general (the (A) part of questions 1-30 and 32-50 in the questionnaire, except for questions 39 and 42 where the (B) part was used – see Annexure 14 for the survey questionnaire).

Two types of regressions were done: a best subsets regression, and a logistic regression. The first type used respondents' reasons for buying the farm as determined on a ten point scale, where values closer to 1 resembled production motives and values closer to 10 resembled lifestyle motives (Question 53 in the survey questionnaire – see Annexure 14). This allowed for finer scale analyses, with play on either side. The logistic regression also used respondents' reason for buying the farm, but here the question where respondents were forced to label themselves as either lifestyle or production motivated, was used (Question 52 in the survey questionnaire – see Annexure 14). Logistic regressions allow for a stricter classification of variables by calculating the likelihood that a variable would appeal to either lifestyle or production inspired buyers. These two types of regression analyses were used because they represented different scales of measurements and therefore shed light on different aspects (a continuous scale in the best subsets regression and exact scale in the logistic regression).

The best subsets regression was used in conjunction with a stepwise regression, which was also subjected to Mallow's Cp criterion. Stepwise, best-subsets and Mallow's Cp regressions draw on different criteria, which make them suitable to use together. Overall the best subsets regression yielded the best fit and its results are provided in Table 6. The best subsets regression findings corresponded with the stepwise regression and Mallow's Cp results (see Annexure 16 for stepwise and Mallow's Cp results). Results specified that the setting of a property (e.g. against a mountain, within a valley), its soil quality and the availability of water for recreation activities were the variables that best predicted whether it would be used for lifestyle or production purposes. The location of an agricultural property being private and secluded, the condition of non-residential

infrastructure and a beautiful view were also included, but were not significant at the specified p-level ($p < 0.05$).

Table 6: Results of best subsets regression: intensive area

Independent variable	Parameter	p-value*
Intercept	5.66	0.00
Location: setting	0.40	0.01
Location: private and secluded	-0.27	0.06
Productive potential: soil quality	-0.41	0.00
Condition of non-residential infrastructure	-0.11	0.31
Aesthetics: view from the property	0.29	0.14
Availability of water for recreation activities	0.24	0.04
Multiple $R^2 = 0.58$		
Adjusted $R^2 = 0.52$		
n = 49		

* Marked effects are significant at $p < 0.05$.

Note: Significant effects are in bold.

Production oriented buyers were attracted to farms with higher soil qualities, as indicated by the negative relationship between soil quality and farms bought for lifestyle reasons. This corresponds with hedonic pricing studies that indicated high correlations between a farm's price and its soil quality (Feng *et al.*, 1993:356; Huang *et al.*, 2006:458; Maddison, 2000:519). At the same time there was a positive relationship between the position of a farm in terms of its setting and purchases for lifestyle reasons: as the setting improved, so did its attractiveness for lifestyle buyers. In a similar way lifestyle buyers also preferred properties with water for recreation purposes. The importance of water recreation opportunities such as fishing and canoeing are also emphasised in the literature (Bastian *et al.*, 2002:337; Deller *et al.*, 2005; Thompson, 2003:328).

The negative relationship between the location of a farm in terms of being private and secluded was surprising, as it was expected that lifestyle buyers would be attracted to such properties. This relationship was also hypothesised in the literature (Thompson, 2003:331-333). Its attraction to production oriented buyers could possibly be explained by the fact that private locations provide better security for protection of produce from theft. The result for this variable was not statistically significant at the specified level and it therefore could be interpreted as an indication that privacy was important to both types of buyers (as also indicated by mean and median score above 7 (out of a possible 10) assigned to this variables by both lifestyle and production oriented buyers – see Annexure 15). As expected, the condition of non-residential infrastructure was important to

production oriented buyers for its contribution towards farming activities, while a beautiful view from the property was important to lifestyle buyers. These two variables were included in the regression analysis results, but not statistically significant at the specified p-level.

Approximately 58 percent of the variability in the reason for buying an agricultural property – for either lifestyle or farming reasons – could be explained by the setting of the property, its soil quality and the availability of water for recreation purposes.

The logistic regression determined the likelihood of a buyer being lifestyle or production oriented, given specific characteristics, by calculating odds ratios. An odds ratio of less than one was an indication of a variable being important to production motivated buyers, while an odds ratio of more than one indicated a likelihood of the variable appealing to lifestyle buyers. The logistic regression results differed from the best subsets regression, except for the variable associated with soil quality, which was significant in both types of regressions, possibly because the best subsets regression was calibrated more finely (see Table 7).

Table 7: Results of the logistic regression: intensive area

Parameter	Odds ratio estimate*	95% Confidence limits	
Productive potential: soil quality	0.47	0.23	0.97
Permanent living rights for labourers	0.61	0.38	0.92
Aesthetics: view from the property	3.65	1.56	8.50
n = 49			

* The Wald Confidence Interval for Adjusted Odds Ratios was used.

Odds ratios of less than one were measured for soil quality and permanent living rights for workers, meaning that as the quality of the soil and the importance of living rights for workers increase, the likelihood of the farm being bought for productive reasons improved. At the same time an odds ratio of more than one was measured for the view from the property for aesthetic reasons, indicating that the presence of a beautiful view from the property improved the likelihood of such a property being bought by a buyer with lifestyle motivations.

Lifestyle buyers were not dependent on the farm for their main income, which presented one reason why they were not interested in enhanced production potential through better soil quality. Soil quality, however, is an important consideration from a production perspective.

The inclusion of permanent living rights for labourers in the results was unexpected and is difficult to clarify. This variable's likelihood to be associated with production oriented buyers could possibly be explained by two diverging reasons: farmers either did not want to buy a farm where permanent living rights could give rise to social problems, or they wanted to buy a property with labourers on it to assist with production. Although a significant amount of literature is available on permanent living rights for workers on farms, it was done outside the valuation framework and is therefore irrelevant within the current context. Lifestyle buyers possibly did not want the burden of acquiring farms which had permanent living rights for labourers, or they did not need a substantial amount of labour for production purposes. In two cases in the qualitative phase, however, the buyers decided to continue farming in order to provide jobs for the existing farm workers, which were unusual, according to valuers and estate agents.

The results indicating that the presence of a beautiful view from the property improved the likelihood of such a property being bought by a buyer with lifestyle motivations was in line with expectations, especially in the intensive area which is known for its spectacular views. It is important to note that while production oriented buyers also scored this variable highly (median score of 8 out of a possible 10), it was even more important for lifestyle buyers (given a median score of 10 out of a possible 10). This is also matched in the literature, where beautiful views enhanced the price of agricultural properties (Bastian *et al.*, 2002:337; Pope and Goodwin, 1984b; Robbins and Ahearn, 1994:37; Spahr and Sunderman, 1999:227; Thompson, 2003:328).

The results from the logistic and best subset regression analyses complimented each other, as they highlighted different aspects due to the different scales of measurements used. This fitted in well with the exploratory nature of the research. The variables indicated in the best subsets and logistic regression results (location in terms of setting, soil quality, availability of water for recreation activities, permanent living rights for labourers and a view from the property) are classified under different factors in the factor analysis (see section 4.4.1.4 and Table 10), which imply that they are not correlated to each other and signify different aspects/ features of farms. For this reason the factor analysis results serve as a confirmation of the regression results.

4.4.1.3 Respondents' understanding of natural scenery and beautiful views

From the case study interviews, it was evident that the aesthetic character of a farm played an integral part in the appeal of agricultural properties for lifestyle buyers. The concept of the term

“beauty” in the real estate context remains unclear. Therefore two survey questions that consisted of a list of variables associated with a beautiful view and natural scenery respectively, were included (Questions 39A and 42A of survey questionnaire – see Annexure 14). As the purpose of these questions was to provide more substance to the term “beauty” as related to natural scenery and beautiful views, it was important to identify variables that all buyers associated with these concepts as applied to agricultural land. A production oriented buyer might perceive a view of vineyards as beautiful, but this does not mean that this buyer would relate it as an important consideration in his/her decision to purchase a farm. For this reason the main focus in the interpretation of the results was not the contrast between the two groups of buyers, but rather to provide a better understanding of what buyers of farms in general associated with the concept “beauty”. In Table 8 the results are provided for all respondents combined and separately for lifestyle and production oriented buyers, as a matter of interest.

Buyers indicated that views of vineyards and mountains were “beautiful”, while views of cultivated lands and orchards were mostly seen as unimportant. It was interesting to note that, while respondents in the case study perceived views of a river front and historic buildings as beautiful, this was not confirmed by respondents in the quantitative survey. Respondents did indicate that views of water, such as a river, stream or dam were important, although the difference in the association between the two types of buyers were statistically significant for this variable (lifestyle buyers had a higher preference for views of water), indicating that water might be beautiful from an aesthetic point of view, but not an important consideration in the purchase of a farm for productive reasons.

Likewise, views of trees, a well-kept garden, valleys, gorges and ravines as well as natural scenery were perceived as important by buyers. Although both groups of buyers’ were intolerant towards views of power lines, there was a statistically significant difference between lifestyle buyers’ intolerance (higher) and production oriented buyers. Unexpectedly, uninterrupted views that stretched to the horizon and views of rural surroundings, as well as sights with limited indications of civilisation were not important to respondents.

Buyers strongly associated natural scenery with mountains and tranquillity (‘peace and quiet’), while openness and space, a pristine environment with vegetation typical of the area and abundant birdlife were also important factors. Although both types of buyers associated streams and waterfalls, clean fresh air and big trees, forest and bush with natural scenery, the differences in

importance of these three variables for lifestyle buyers and production oriented buyers were statistically significant (lifestyle buyers indicating stronger associations).

Table 8: Summary of results of factors associated with a beautiful view and natural scenery: intensive area

Factors associated with a “beautiful” view			
Variable	% All respondents answering positively	% Lifestyle buyers answering positively	% Production oriented buyers answering positively
View of vineyards	80.00	79.49	80.95
View of orchards	40.00	46.15	28.57
View of cultivated lands	26.67	28.21	23.81
View of natural veld	38.33	41.03	33.33
View of indigenous vegetation (such as fynbos, karoo bush)	41.67	46.15	33.33
View of trees	58.33	66.67	42.86
View of mountains and mountain ranges	83.33	84.62	80.95
View of valleys, gorges and ravines	51.67	53.85	47.62
View of water such as a river, stream or dam*	58.33	69.23	38.1
View of river frontage	36.67	38.46	33.33
View of rural surroundings and farms scenery (e.g. horses grazing)	45.00	48.72	38.1
360 degrees uninterrupted views (i.e. no obstructions in terms of human-made structures or anything else that could obstruct the view)	40.00	46.15	28.57
View of the sea	30.00	23.08	42.86
View of natural scenery	55.00	58.97	47.62
No Eskom power lines in sight*	56.67	66.67	38.1
No sign of civilisation (e.g. roads, buildings)	20.00	20.51	19.05
View that stretches to the horizon, such as never-ending karoo plains	15.00	20.51	4.76
View of historical buildings	25.00	28.21	19.05
View of a well-kept garden	58.33	61.54	52.38
n = 60 (39 lifestyle, 21 production)			
Factors associated with natural scenery			
Variable	% All respondents answering positively	% Lifestyle buyers answering positively	% Production oriented buyers answering positively
Pristine environment with vegetation typical of the area	60.34	68.42	45.00
Big trees, forests and bush*	63.79	73.68	45.00
Valleys, gorges and ravines	43.10	47.37	35.00
Mountains	82.76	86.84	75.00
Rock formations and rock faces	34.48	34.21	35.00
Streams and waterfalls*	62.07	71.05	45.00
Rivers, river frontage and riparian areas	46.55	52.63	35.00
Wildlife	37.93	34.21	45.00
Birdlife	63.79	65.79	60.00
No sign of civilisation (such as roads and buildings)	22.41	23.68	20.00
Openness and space	68.97	76.32	55.00
Clean fresh air*	74.14	84.21	55.00
Peace and quiet (tranquillity)	79.31	86.84	65.00
n = 58 (38 lifestyle, 20 production)			

* Statistically significant differences ($p < 0.05$) between lifestyle and production oriented buyers were recorded for these variables.

Note that variables with scores higher than 50% are in bold.

4.4.1.4 Factor analysis

The survey included a substantial number of variables associated with the characteristics of farms, leading to the decision to use factor analyses in order to investigate correlation patterns that might exist among variables. Factor analysis is usually done in exploratory data analysis to determine the structure of relationships between variables by identifying groups of variables, some that are highly and significantly correlated with each other. The purpose of exploratory factor analyses is to determine the nature of the common factors involved (i.e. to identify the factors causing high correlations between variables), while the number of variables is reduced to a few primary factors. It transforms the data to a different dimension, where each variable (characteristic) has a calculated factor loading that is an indication of the extent of correlation with the factor. As such, factor analyses re-organise the data into clusters (factors) that give an indication of the main themes associated with value attributes, as characteristics with high factor loadings usually share a common feature.

A principal component factor analysis specified for six factors that included all variables (the (A) part in questions 1 to 30 and 32 to 50, except for questions 39 and 42, where the (B) part was used – see Annexure 14) was attempted with a varimax normalised rotation to highlight the simple structure among the six factors identified⁴. Factor analysis also indicated the total amount of variance explained by each factor and the Eigenvalue of factors, which represents the proportion of variance accounted for by the correlation between the underlying dormant variables. In total, 60.56 percent of the total variance is explained by the six factors, as indicated in Table 9.

4 In actual fact two factor analyses were done with six and ten factors respectively. It was decided to use the factor analysis consisting of six factors, as the correlated variables in this solution made better sense to group together than those in the ten factor solution, even though the analysis with ten factors explained a higher percentage (73.5 percent) of the total variance than the six factor analysis which explained 60.6 percent of total variance. The Kaiser criterion, which states that only factors with Eigenvalues greater than one should be used, was also borne in mind in the choice of the number of factors to include.

Table 9: Percentage and cumulative Eigenvalues and variance of the six dominant factors related to the purpose for buying agricultural land: intensive area

Factor	Eigenvalue	Percentage of total variance	Cumulative Eigenvalue	Cumulative percentage
1	13.46	27.47	13.46	27.47
2	4.75	9.69	18.21	37.16
3	3.98	8.11	22.19	45.28
4	2.94	6.01	25.13	51.28
5	2.53	5.17	27.66	56.45
6	2.01	4.11	29.68	60.56

The factor loadings of variables are provided in Table 10. The simple structure in the factor loadings matrix showed which items loaded on the different factors and these factors could then be interpreted. In essence, the loading for a factor analysis on the correlation matrix could be interpreted as the correlations between the items and the factors, enabling the researcher to identify the factors, i.e. interpret the factors with appropriate names (e.g. derived from variables that showed highest correlations with factor).

Factor loadings of 0.5 and above (indicating correlations of 50 percent and higher with the specific factor) were seen as significant and therefore interpreted. Variables which registered factor loadings above 0.4 for more than one factor were removed from the analysis, as such cross loadings made the classification of variables into one specific factor difficult. This resulted in the removal of nine variables (condition of existing cultivated areas, water availability for human and animal consumption, capacity of infrastructure, irrigation infrastructure and capacity, the presence of trees, dams and rivers for aesthetic reasons and outdoor recreation potential).

Factor 1 (Aesthetic beauty) correlates highly with variables associated with the aesthetic appeal of a farm and is related to lifestyle considerations. The setting of an agricultural property against a mountain and within a valley, the presence of mountains, views, natural scenery, a rural landscape and the aspect of the property all contribute towards the attractiveness of a farm, but do not enhance agricultural potential. This factor relates to the aspects listed by respondents in their understanding of a beautiful view and natural scenery. It also reflects the sentiments put forward by lifestyle buyers interviewed in the case study with regard to attributes that appeal to them, while various studies described these variables as natural amenities attractive to urban dwellers (Bourassa *et al.*, 2004:1430; McGranahan, 1999:3-10; Nickerson and Hellerstein, 2003:124-144; Palang *et al.*, 2004:751; Pope and Goodwin, 1984a:750-754; Thompson, 2003:328, 333).

Table 10: Factor loadings indicating variables highly correlated to factors relating to the purpose for buying agricultural land: intensive area

Variable	Factors*					
	Factor 1 Aesthetic beauty (Lifestyle)	Factor 2 Production potential (Production)	Factor 3 Location (Lifestyle and production)	Factor 4 Infrastructure (Lifestyle and production)	Factor 5 Recreation activities (Lifestyle)	Factor 6 Electricity infrastructure (Production)
Location: close to city	-0.06	-0.09	0.80	-0.06	0.19	-0.09
Location: close to town	0.20	0.09	0.77	0.05	0.13	0.00
Location: close to major road	-0.11	-0.18	0.80	0.20	-0.06	0.07
Location: travelling time	0.02	0.16	0.78	0.18	-0.10	0.24
Location: setting	0.83	0.05	0.08	0.24	0.12	0.03
General production potential	-0.09	0.74	0.05	0.01	-0.10	0.18
Soil quality	-0.11	0.72	0.08	-0.01	-0.07	0.18
Meso climate	0.13	0.56	0.20	0.24	0.03	0.12
Expansion possibilities of existing cultivated areas	0.13	0.69	-0.27	0.10	-0.03	0.05
Potential to keep game	-0.14	0.23	0.08	0.30	0.65	-0.03
Topography: varied	0.21	0.57	-0.02	-0.06	0.22	-0.30
Topography: aspect	0.63	0.23	-0.10	0.14	-0.34	-0.02
Residence: style	0.28	0.00	0.00	0.69	0.20	0.17
Residence: size	0.28	-0.01	0.08	0.66	0.13	0.29
Residence: condition	-0.02	0.10	0.36	0.66	0.18	0.22
Residence: historical character	0.32	-0.11	-0.05	0.71	0.13	0.04
Other residences: condition	0.19	0.12	0.21	0.80	0.03	0.00
Other residences: accommodation capacity	0.39	0.09	0.29	0.60	-0.10	0.18
Labour housing: condition	0.01	0.34	-0.23	0.55	0.06	0.34
Other residential: income potential	0.27	0.07	0.33	0.64	0.03	-0.15
Permanent living rights for labourers	0.17	0.018	-0.06	0.27	0.02	0.18
Infrastructure: condition	-0.06	0.16	0.12	0.57	0.13	0.35
Infrastructure: historical character	0.16	0.13	-0.02	0.71	0.32	-0.01
Electricity supply	0.20	-0.11	0.33	0.29	-0.21	0.69
Aesthetics: natural scenery	0.79	-0.04	-0.04	0.22	0.28	0.16
Aesthetics: mountain	0.78	-0.05	-0.10	0.13	0.15	0.12
Aesthetics: view	0.80	0.15	0.16	0.14	0.25	0.29
Aesthetics: rural surroundings	0.73	0.10	-0.02	0.04	0.19	0.15
Water recreation potential	0.37	-0.06	0.07	0.14	0.76	-0.05
Water availability for income generating activities other than irrigation (tourism)	0.25	-0.12	-0.03	0.09	0.75	-0.01

n = 53

*Significant factor loadings (correlation of 50 percent and higher) in bold.

It was expected that the presence of a river, river frontage or a dam would also have significant factor loadings as these variables are associated with aesthetic beauty and were assigned a high priority by buyers in the qualitative analyses. However, due to their cross loadings these variables were removed from analysis.

The second factor is called “Production potential” and relates to the potential of the farm for agricultural production in general, and specifically the soil quality, climate, the possibility of expansion of existing cultivated areas and topography. These present the traditional value attributes sought by production oriented buyers as indicators of the agricultural potential of a piece of land. These variables were also emphasised by valuers in their valuation reports and in hedonic pricing studies (see Annexure 1).

The collective name for the correlated variables in Factor 3 is “Location” and relates to both lifestyle and agriculturally productive buyers. The location of a property with regard to its proximity to a major road, town and city, as well as its accessibility in terms of travelling time are important variables listed in this factor. More than half of the respondents were lifestyle buyers, and the proximity to towns and cities and accessibility in terms of travelling time are important considerations for people who commute from their workplace/businesses in Cape Town or some of the towns in the area to their rural homes, while enjoying a rural lifestyle. The same variables are important to commercial farmers in order to cut down on transport costs. Farms that are easily accessible and situated on wine routes make them more attractive for tourists.

Factor 4 (Infrastructure) correlates highly with variables associated especially with the residential infrastructure on agricultural properties. The style, condition, historical character, size and accommodation capacity of the main residence are included, while the accommodation capacity, condition and potential to earn income from additional residential houses such as labourers’ cottages are also important. Many land owners generate extra income through renting out residential units such as labour cottages on farms to tourists or students from Stellenbosch, while many lifestyle buyers require additional residential infrastructure to accommodate friends and family over weekends and holidays. The historical character of buildings typical of this area attracts many buyers and tourists. The condition and historical character of non-residential infrastructure also show significant correlations with this factor, meaning that “Infrastructure” is important to both lifestyle and production oriented buyers. Farmers also rent out additional housing to tourists, while the capacity and condition of functional infrastructure are important for production purposes. At the same time the historical character of non-residential infrastructure such as wine cellars provides additional appeal to tourists and is important to lifestyle buyers who plan to open their own boutique winery.

It is noteworthy that the presence and condition of residential infrastructure was not the deciding factor for lifestyle buyers interviewed during the case study, although it did influence buyers. In a

quarter of the cases the historic building style of the residence was a major attraction, but on the whole, buyers had spent or were planning to spend additional money on the property either to upgrade existing residential infrastructure or build new facilities. At the same time non-residential infrastructure such as stables and sheds were useful, but not a critical consideration.

The variables in Factor 5 are associated with recreation activities, whether for money purposes or own enjoyment. For this reason it is called “Recreation activities” and relates to lifestyle purposes. Characteristics such as the availability of water for recreation activities for own relaxation and income generation from activities not related to irrigation agriculture, are significant. It was expected that the outdoor recreation potential of a property would be included in this factor, but due to its cross loading with factor 1 (aesthetic beauty for lifestyle purposes) it was removed from further analysis. The inclusion of the variable associated with the potential to keep game is somewhat surprising, as the intensive area is not suitable for game, but buyers possibly intended to keep a selected number of indigenous animals for biodiversity or tourism purposes.

Factor 6 posed a challenge, as most characteristics with high loadings within this factor had cross loadings with other factors. In the end this factor was called “Electricity”, as this was the only variable that remained.

Some variables did not feature at all in the factor analysis. The size of the farm did not show up in any factor, probably because most farms were relatively small to start off with and the sample excluded smallholdings up to 5 hectares. This was an important consideration for buyers, sellers and valuers in the qualitative analyses. It was included as an explanatory variable in most hedonic pricing studies, but was not significant in all of them (Chicoine, 1981:353; Dunford *et al.*, 1985:10-11; Feng *et al.*, 1993:356; Guiling *et al.*, 2007:20; Huang *et al.*, 2006:458; Kennedy *et al.*, 1997:5; King and Sinden, 1988:242; Reynolds and Regalato, 2002:182; Shonkwiler and Reynolds, 1986:58).

Variables such as grazing potential and fencing infrastructure were not included, possibly because the intensive area is not conducive to livestock or game farming practices, even though buyers did indicate that farms purchased did not provide sufficient fencing. The importance of water for irrigation purposes was excluded, which was surprising, as infrastructure associated with irrigation purposes was listed as a factor (Factor 6). Another surprising omission was that of accessibility of the property for tourism purposes, as some factors did point to income from tourism activities. A possible reason is that most primary and secondary roads are relatively accessible. The location of a

property in terms of being secluded and private was not included in either Factor 1 (Aesthetic beauty) or Factor 3 (Location). It is possible that respondents perceived privacy and setting as the same thing, as a location against a mountain and in a valley is usually relatively private. The exclusion of the location near to an airport could probably be explained by the fact that the intensive area is situated within close proximity to Cape Town and its international airport.

The presence of indigenous vegetation for aesthetic purposes was also excluded, which is understandable if one looks at respondents' low preference for it as part of a beautiful view. The accommodation capacity of housing for labourers and legal permanent living rights for labourers did not show significant factor loadings. The likely reason for this is that permanent living rights are a contentious issue for farmers and lifestyle buyers alike: it is seen as politically incorrect to be averse to labours living permanently on the farm. Status did not feature in any of the six factors. Many respondents appeared to be indifferent to the status of the property they bought. It is expected that this might have been an important consideration for buyers, but that they were hesitant to admit it. This area is in a famous wine region where many celebrities and well known business people buy farms to produce wine under their own label.

To emphasise the significant correlations that exist a test for sphericity was done. The determinant of the correlation matrix for the intensive area study among the variables (to which also may be also be referred to as items) is equal to $5.845 \cdot 10^{-31}$ with the p-value for the test for sphericity being less than 0.001. Thus there were highly significant relationships among the regressor variables (see section 4.4.1.2). Although the sample size for the factor analysis in the intensive area case was only 53, the high significance of the sphericity test indicated that a factor analysis was worthwhile to execute, in order to get indications for further studies in this regard (where bigger samples would be used). As this was an exploratory factor analysis, the limitation of a confirmatory factor analysis that the total number of cases divided by the number of factors should preferably be more than 5, was not applicable.

It is interesting to note that the significant regressors from the multiple regression all resort to different factors, indicating their orthogonality (non-linearity).

4.4.2 Extensive area

Analyses identical to that carried out in the intensive area were done in the extensive area. The intra-correlation co-efficiency for agreement and consistency was used to determine to what extent the specific attributes sought by respondents were satisfied by the particular property bought (comparing the (A) part of questions 1 to 30 and 32 – 50 with their respective (B) parts, except for questions 39 and 42, where the (B) and (C) parts were compared). Results indicated that respondents felt that agricultural properties lacked proximity to an airport, water availability for human and animal consumption, the condition of the residential infrastructure, accommodation capacity of other residential housing and income generated from it, the need for permanent living rights for farm workers and the historical character of the non-residential infrastructure. Alternatively, it is possible that these attributes were not perceived as important in the first place.

The extensive area is a semi-arid and remote region and it is understandable that water availability and distance to airport could be concerns. The isolation, space, tranquillity and specific climate and vegetation could, however, also be an attraction to some buyers, as indicated by parties interviewed in the qualitative phase. Many Karoo farms were normally used for grazing during winter and people did not live there permanently, thus the residential infrastructure was fairly basic in many cases (and of a specific style) and this could have contributed to buyers feeling that they did not get what they wanted. Many lifestyle buyers need more than basic housing to accommodate family and friends. The fact that buyers did not get what they needed in permanent living rights for farm workers is difficult to explain, as it could be interpreted in different ways: buyers either did not want permanent living rights for workers because of labour related problems, or they actually wanted somebody to live permanently on the farm to keep an eye on activities, but there were no workers because of an absence of living rights for workers.

The variables that were important to both lifestyle and production oriented buyers according to mean and median scores are provided in Annexure 15. Water availability is always a major concern in arid and semi-arid areas, and for this reason the maximum median score of 10 allocated by both types of buyers was expected. Privacy was another important consideration for both types of buyers, possibly because a secluded farm is more secure from negative elements such as small stock thieves from a production perspective, while it provides tranquillity to lifestyle buyers escaping the rat race.

Soil quality, size of the farm, indigenous vegetation and grazing capacity were important considerations from an agricultural production perspective, as indicated by the median score of 9

allocated by respondents with production motives. This is in line with studies that investigated the contribution of productive characteristics on farm prices (Chicoine, 1981:353; Feng *et al.*, 1993:356; Vasquez *et al.*, 2002:69). These variables were also important to lifestyle buyers, even though they scored them slightly lower than production oriented respondents, with the exception of grazing capacity of indigenous vegetation, which was especially important to lifestyle buyers who wanted to keep game on their farms. This confirms the observation made in the qualitative phase that selected production oriented attributes were important to lifestyle buyers, but for different (aesthetic) reasons. Two studies also indicated the importance of grazing capacity for wildlife habitat and not agricultural production purposes (Bastian *et al.*, 2002:337; Pope, 1985:81-87). The size of the property was significant as a viable economic unit for farmers (large tracks needed). Lifestyle buyers, on the other hand, wanted farms that were not too big to manage.

The meso climate was important from an agricultural point of view, but also played a role in the decisions of lifestyle buyers, as it affected the outdoor recreation potential of properties. The extensive area gets extremely hot during summer months, which has to be taken into account by buyers. The accessibility of the property in terms of traveling time had an impact on both types of buyers, as indicated by median scores of 8 out of a possible 10. Lifestyle buyers traveling from Cape Town or neighbouring towns do not want to spend more than three hours on the road, while traveling time also impacts on farmers' transport costs and thus profits. Interestingly, buyers with production motives expressed a preference for aesthetic attributes such as natural scenery, indigenous vegetation (although this is suspected to be related to grazing capacity), trees and views. These were matched by lifestyle buyers, who wanted properties suitable for outdoor recreation activities such as hiking, quad biking and game viewing.

4.4.2.1 Analysis of variance

Analysis of variance was done in a similar way as described for the intensive area (comparing continuous response variables (as per the (A) section of questions 1 to 30, and questions 32 to 50, except for questions 39 and 42, where the (B) section was used) with categorical input variables (respondents' reason for purchasing the farm, as per question 52 – see Annexure 14 for the survey questionnaire)). The results of the analysis of variance indicate the variables for which significant and clear distinctions could be made between lifestyle and production oriented buyers and these are provided in Table 11. Tests for homogeneity of variance and tests for normality of the residuals

were done and a Mann-Whitney U test was done as for non-parametric data for residuals that were not normally distributed.

Results revealed eighteen characteristics of farms where there were significant differences between lifestyle and production oriented buyers (which is more than the eleven characteristics indicated in the intensive area). As expected, value attributes related to the production potential of farms were not as important to buyers with lifestyle purposes in mind as to buyers who had commercial agricultural production in mind. The general production potential was most important to production oriented buyers (with the median score at a maximum of 10 (out of a possible 10)), as were other production related factors such as soil quality, aspect of the farm (i.e. north or south facing), condition of existing cultivated areas, availability of water for irrigation purposes, capacity and condition of existing irrigation infrastructure and also the electricity to use this infrastructure.

The accommodation capacity of the main residence was important to lifestyle buyers, but not to farming related buyers, as lifestyle buyers use these properties for holidays and entertaining friends and family. Although both types of buyers found a varied topography appealing, lifestyle buyers indicated a stronger preference for it. This is in line with buyers interviewed in the case study, who also specified a preference for mountainous terrain. Although studies regarding aesthetic beauty include topography as a characteristic that attracted people (McGranahan, 1999:5; Pope and Goodwin, 1984b:750; Thompson, 2003:330), results of hedonic studies indicated that the slope (aspect) was not a statistically significant determinant of agricultural property prices (Henderson and Moore, 2006:609; King and Sinden, 1994:42; Lopez *et al.*, 1994:59; Schutjer and Hallberg, 1968:572; Spahr and Sunderman, 1999:241).

The potential to keep game and the existence of game proof fencing were important to lifestyle buyers, as this type of buyer is interested in nature and wildlife and probably hunts occasionally for recreation purposes (as also indicated by the median score of 9 ascribed to the availability of outdoor recreation activities by lifestyle buyers – see Annexure 15). It was expected that production oriented buyers would also have valued these two factors, as a result of the increase in commercial hunting activities in this area.

Table 11: Variables that differ significantly between lifestyle and production oriented buyers: extensive area

Variable	Z	p-value*	Z adjusted
Agricultural production potential in general	-4.54	0.00	-4.67
Agricultural production potential: soil quality	-3.06	0.00	-3.10
Condition of existing cultivated areas	-2.59	0.01	-2.64
Potential to keep game	2.81	0.00	2.85
Topography: varied terrain	2.06	0.04	2.10
Topography: aspect	-2.20	0.03	-2.22
Water availability for irrigation	-2.48	0.01	-2.54
Size of the main residence	2.65	0.01	2.67
Electricity supply	-2.49	0.01	-2.54
Condition of irrigation infrastructure	-4.31	0.00	-4.38
Capacity of irrigation infrastructure	-3.94	0.00	-4.00
Game proof fencing	2.51	0.01	2.54
Aesthetics: presence of natural scenery	3.39	0.00	3.49
Aesthetics: presence of river or stream	2.33	0.02	2.37
Aesthetics: presence of mountain	3.34	0.04	3.48
Aesthetics: View from the property	3.01	0.00	3.07
Aesthetics: presence of indigenous vegetation	1.45	0.15	1.49
Outdoor recreation activities	3.65	0.00	3.72
n = 59 (30 lifestyle, 28 production)			

* Marked effects are significant at $p < 0.05$.

As anticipated, the presence of natural scenery, rivers or streams, mountains, beautiful views and indigenous vegetation for aesthetic reasons were important to lifestyle buyers. It is noteworthy that the median score that lifestyle buyers ascribed to the presence of natural scenery for aesthetic reasons was substantial (9 out of 10). Even though both farming and lifestyle oriented buyers scored the presence of indigenous vegetation and trees for aesthetic purposes high, there were still significant differences in how important these variables were - lifestyle buyers gave the highest score, probably because farming oriented buyers emphasised these variables more for grazing than aesthetic reasons.

4.4.2.2 Multiple regression analysis

Stepwise and best subsets regression analyses, followed by a regression using Mallows's C_p criterion were executed, with the best subsets once again yielding the best fit by explaining 70 percent of the variation in the reason for buying agricultural properties, as depicted in Table 12.

However, the results of the stepwise regression and regression using Mallow's Cp criterion corresponded with those of the best subset regression and are provided in Annexure 16.

The dependent variable was once again respondents' reason for buying the property (as per questions 53), which was regressed against the independent variables that consisted of the characteristics sought by respondents in general (the (A) part of questions 1-30 and 32-50 in the questionnaire, except for questions 39 and 42 where the (B) part was used – see Annexure 14 for the survey questionnaire). Seven variables were included as important in distinguishing between lifestyle and production oriented buyers, but only three of these were statistically significant, namely the general agricultural potential of the property, its suitability for outdoor recreation activities and the size of the main residence.

The negative sign of the variable related to the general agricultural production potential was expected, as it indicated that it was more important to production oriented than lifestyle buyers (as production potential of a farm increases, its appeal to production oriented buyers increases and decreases for buyers with lifestyle motivations). Conversely, a farm's suitability for outdoor recreation activities and the size of the main residence were important attractions for lifestyle buyers, as was indicated by the positive signs. Relevant literature emphasised the importance of activities such as wildlife viewing and hunting for recreation purposes and for this reason the positive relationship with lifestyle buyers was not unusual (Guiling *et al.*, 2007; Irwin *et al.*, 2003:22-23; Nickerson and Hellerstein, 2003:129; Pope and Goodwin, 1984a:752; Pope and Goodwin, 1984b:37-38; Shrestha and Alavalapati, 2004:19).

Table 12: Results of best subsets regression: extensive area

Independent variable	Parameter	p-value*
Intercept	5.10	0.00
General agricultural potential	-0.38	0.00
Size of the main residence	0.32	0.01
General condition of non-residential infrastructure	-0.22	0.06
Presence of irrigation infrastructure	-0.10	0.29
Aesthetics: view from property	0.23	0.13
Aesthetics: presence of dam	-0.20	0.11
Suitability of the property for outdoor recreation activities	0.38	0.01
Multiple R ² = 0.70		
Adjusted R ² = 0.66		
n = 48		

* Marked effects are significant at p < 0.05 (in bold).

The general condition of non-residential infrastructure, presence of irrigation infrastructure, a view from the property and presence of a dam for aesthetic purposes were also included in results, although they were not significant. The negative sign associated with the presence of a dam for aesthetic purposes indicates that this variable was connected to production oriented buyers, which was contrary to expectations. This relationship could possibly be attributed to the fact that farmers in the extensive area would be willing to pay more for properties where water is readily available because of the arid nature of the area. The positive relationship of the presence of views and lifestyle buyers was expected, as lifestyle buyers were attracted to beautiful views from their properties. At the same time, the condition of non-residential infrastructure and the presence of irrigation infrastructure were important considerations for production purposes.

The best subsets regression was followed by a logistic regression, for the same reasons as explained in the intensive area. In this case, variables with odds ratios above one were indicators of the farm being purchased for agricultural production purposes (see Table 13). Likewise, variables with odds ratios below one indicated the probability of the farm being attractive to lifestyle buyers. Odds ratios indicated that the likelihood of a farm being purchased by lifestyle buyers increased if a main residence of appropriate size and natural scenery were present. This was expected, as time spent with friends and family together participating in outdoor recreation activities was important to lifestyle buyers and they needed accommodation facilities and a residence of appropriate size. This finding converges with the results of two hedonic pricing studies done which indicated that the size of a house positively influenced the price of the agricultural property (Feng *et al.*, 1993:356; Maddison, 2000:519).

Table 13: Results of the logistic regression: extensive area

Parameter	Odds ratio estimate*	95% Confidence limits	
Size of the main residence	0.05	0.01	0.76
Presence of irrigation infrastructure	33.73	1.34	844.68
Aesthetics: presence of natural scenery	0.26	0.08	0.88
n = 51			

* The Wald Confidence Interval for Adjusted Odds Ratios was used.

The natural scenery of the Karoo also attracted buyers who appreciate its peace and quiet, indigenous vegetation and wildlife. Odds ratios indicated the likelihood that that irrigation infrastructure in a good serviceable condition would attract production motivated buyers. It is noteworthy that the odds ratio estimate for this variable was highly significant; indicating the strong

likelihood that farms in the extensive area with irrigation infrastructure in a serviceable condition would attract buyers with agricultural production motives.

4.4.2.3 Respondents' understanding of natural scenery and beautiful views

Respondents' perceptions regarding a beautiful view and natural scenery are provided in Table 14. Perceptions regarding a "beautiful" view differed between the intensive and extensive areas. In the extensive area only 2 percent of buyers perceived views of vineyards as beautiful, while 80 percent of all buyers in the intensive area considered them important as part of a "beautiful view". In the extensive area views of indigenous vegetation and natural veld were regarded as beautiful by all buyers. Many people are attracted to the unique vegetation of the Karoo and its arid landscape where minimal water is available for the irrigation of orchards and vineyards. Buyers were intolerant of a view overlooking power lines, while views of natural scenery and mountains were important. Even though views of valleys and water such as a river, stream or dam, as well as uninterrupted views stretching to the horizon, were considered important elements of a "beautiful view" by both groups of buyers, the differences between the two groups of buyers regarding these factors were statistically significant (these factors were more important to lifestyle buyers).

Both groups of buyers in the extensive area associated natural scenery with pristine environments consisting of vegetation typical of the area, together with tranquillity, openness and space with clean air, wildlife, birdlife, mountains, rock formations, valleys and rivers or river frontage. Lifestyle buyers felt particularly strongly about the presence of a tranquil, pristine environment with wildlife and space. The difference between lifestyle buyers and production oriented buyers' associated importance of these variables were statistically significant.

Table 14: Summary of results of factors associated with a beautiful view and natural scenery: extensive area

Variable	% All respondents answering positively	% Lifestyle buyers answering positively	% Production oriented buyers answering positively
Factors associated with a “beautiful” view			
View of vineyards	1.72	3.33	0
View of orchards	8.62	3.33	14.29
View of cultivated lands*	17.24	6.67	28.57
View of natural veld*	75.86	86.67	64.29
View of indigenous vegetation (such as fynbos, karoo bush)	63.79	70	57.14
View of trees	39.66	36.67	42.86
View of mountains and mountain ranges	72.41	80	64.29
View of valleys, gorges and ravines*	58.62	73.33	42.86
View of water such as a river, stream or dam*	60.34	73.33	46.43
View of river frontage	34.48	36.67	32.14
View of rural surroundings and farms scenery (e.g. horses grazing)	25.86	20	32.14
360 degrees uninterrupted views (i.e. no obstructions in terms of human or other structures)*	36.21	56.67	14.29
View of the sea	6.90	6.67	7.14
View of natural scenery	58.62	66.67	50
No ESKOM power lines in sight	55.17	63.33	46.43
No sign of civilisation (e.g. roads, buildings)*	43.10	56.67	28.57
View that stretches to the horizon, such as never-ending karoo plains*	60.34	73.33	46.43
View of historical buildings	1.72	0	3.57
View of a well-kept garden	24.14	23.33	25
n = 58 (30 lifestyle, 28 production)			
Factors associated with natural scenery			
Variable	% All respondents answering positively	% Lifestyle buyers answering positively	% Production oriented buyers answering positively
Pristine environment with vegetation typical of the area*	79.31	93.33	64.29
Big trees, forests and bush	29.31	23.33	35.71
Valleys, gorges and ravines	58.62	66.67	50
Mountains	63.79	70	57.14
Rock formations and rock faces*	53.45	66.67	39.29
Streams and waterfalls*	46.55	60	32.14
Rivers, river frontage and riparian areas	56.90	60	53.57
Wildlife*	75.86	86.67	64.29
Birdlife	72.41	80	64.29
No sign of civilisation (such as roads and buildings)*	43.10	56.67	28.57
Openness and space*	75.86	86.67	64.29
Clean fresh air	74.14	83.33	64.29
Peace and quiet (tranquillity)*	79.31	93.33	64.29
n = 58 (30 lifestyle, 28 production)			

* Statistically significant differences ($p < 0.05$) between lifestyle and production oriented buyers were recorded for these variables.

Note that variables with scores higher than 50% are in bold.

4.4.2.4 Factor analysis

The survey variables associated with the characteristics of farms were also subjected to a principal factor analyses that included all variables (the (A) part in questions 1 to 30 and 32 to 50, except for questions 39 and 42, where the (B) part was used – see Annexure 14) in order to identify groups of variables that are highly correlated. A factor analysis consisting of ten factors explained approximately 73 percent of the total variation in factors. However, as with the intensive area, it was decided to use an analysis consisting of 6 factors instead. Although this only explained 60.5 percent of the variation, the organisation of variables into these factor groupings presented the most sensible hierarchy of motivations. The Eigenvalues and percentage of total variance explained by the factors is presented in Table 15. Factor 1 explained 22.9 percent of the total variation and Factor 2 explained 7.16 percent.

Table 15: Percentage and cumulative Eigenvalues and variance of the six dominant factors related to the purpose for buying agricultural land: extensive area

Factor	Eigenvalue	Percentage of total variance	Cumulative Eigenvalue	Cumulative percentage
1	10.95	22.34	10.95	22.34
2	7.17	14.62	18.11	36.96
3	3.38	6.90	21.49	43.86
4	2.98	6.09	24.47	49.95
5	2.93	5.97	27.40	55.92
6	2.25	4.59	29.65	60.51

The factor loadings of variables are provided in Table 16 and give an indication of the extent of correlation between variables and factors. The factor headings were derived from the variables that showed the highest correlations within the factor. As was the case in the intensive area, variables with cross loadings (loadings of 0.4 or higher for more than one factor) were removed from further analysis. This led to the removal of five variables (condition and accommodation capacity of labour housing, condition of infrastructure and the presence of a mountain or dam for aesthetic purposes).

Factor 1 (Infrastructure) correlates highly with variables associated with the style, condition, size and capacity of residential and non-residential infrastructure on farms. These are important for both farming and lifestyle reasons, as lifestyle buyers sometimes require accommodation facilities for friends and family. Farmers are interested in functional infrastructure such as sheds and fences. Farm valuations usually place comparatively little emphasis on infrastructure, but these results indicated that farmers consider infrastructure to be important.

The variables included in Factor 2 showed significant correlations with the aesthetic beauty on farms, including the presence of natural scenery, views, rural surroundings, indigenous vegetation, trees and a varied topography. The suitability of the property for outdoor recreation activities such as hiking, game watching and hunting showed a high correlation (78 percent) with this factor, which contributed to the lifestyle quality of the factor. This is in line with variables associated with aesthetic beauty, as listed in the literature (Arriaza *et al.*, 2004:124; Clendenning *et al.*, 2005:3-10; Irwin *et al.*, 2003:21-23; Nickerson and Hellerstein, 2003:129; Pope and Goodwin, 1984a:750-755; Robbins and Ahearn, 1994; Thompson, 2003:329-334).

Surprisingly, variables such as the setting of a farm, the potential for keeping game, the presence of a river (for aesthetic reasons) and the status of the farm did not have significant correlation with this factor. Status probably does not play a big role in remote, extensive areas, as is the case in intensive areas such as the Stellenbosch region. The extensive area is seen primarily as a place of retreat and solitude, and if buyers do want to show off their purchases, this could be done by inviting friends and family. The production of game variable can possibly have been captured in the presence of a game proof fence variable (Factor 5), while the exclusion of the setting of the farm could point to its insignificance in such a vast, extensive area, or the possibility that solitude in itself *is* the setting.

The lack of interest in a river is difficult to explain, especially because it was regarded as important by lifestyle buyers interviewed in the case study phase. A possible reason for this is that buyers are aware of water scarcity and do not expect rivers in this area. Water is a means to an end and not an end in itself (i.e. for aesthetic or recreation purposes) and buyers are drawn to other attributes such as the particular vegetation or mountains.

The collective name for the correlated variables in Factor 3 is “Location”. This relates to the proximity of farms to the nearest town, city and major roads, as well as in terms of travelling time. This could be important for both lifestyle and production oriented reasons, as many lifestyle buyers live in Cape Town and surrounding urban areas and want an agricultural property for a weekend and holiday retreat that can be accessed within about three hours’ driving time. Distance to the market is also an important cost consideration for farmers. The road network in the extensive area consists mainly of dirt roads that are often in a bad condition. Farmers and lifestyle buyers alike would appreciate an easily accessible property. The distance to the nearest airport was not included in these factors, which could be an indication that buyers find the remoteness of the region appealing, or that they have already discounted the absence of an airport before deciding to buy a property in this area.

Table 16: Factor loadings indicating variables highly correlated to factors relating to the purpose for buying agricultural land: extensive area

Variable	Factors*					
	Factor 1 Infrastructure (lifestyle and production)	Factor 2 Aesthetic beauty (lifestyle)	Factor 3 Location (lifestyle and production)	Factor 4 Security (lifestyle and production)	Factor 5 Tourism attractions/ facilities (lifestyle and production)	Factor 6 Production potential (production)
Location: close to city	-0.06	0.12	0.83	-0.01	0.14	-0.11
Location: close to town	0.16	0.00	0.72	0.12	0.04	0.25
Location: close to major road	0.16	0.12	0.77	0.02	0.02	0.29
Location: travelling time	-0.09	-0.09	0.63	0.17	-0.07	0.05
Accessibility for tourism activities	0.03	0.12	0.02	-0.17	0.67	0.08
Position: private and secluded	0.07	0.25	0.05	0.51	0.25	-0.08
General production potential	0.13	-0.20	0.19	0.37	-0.16	0.70
Soil quality	0.11	0.15	0.00	0.23	0.01	0.77
Meso climate	0.16	0.31	0.27	-0.14	0.21	0.63
Condition of existing cultivated areas	0.20	0.01	0.16	-0.26	0.17	0.69
Expansion possibilities of existing cultivated areas	0.11	-0.01	0.26	-0.45	0.00	0.57
Grazing capacity	0.23	0.24	0.13	0.63	-0.01	0.01
Topography: varied	-0.03	0.71	0.07	0.25	0.13	0.01
Water availability for irrigation purposes	0.18	0.12	0.14	-0.15	-0.14	0.78
Residence: style	0.74	0.33	-0.07	0.08	0.24	0.00
Residence: size	0.79	0.21	0.21	0.09	0.09	0.11
Residence: condition	0.78	0.06	-0.08	0.01	0.11	0.15
Residence: historical character	0.32	0.22	-0.14	0.30	0.65	0.12
Other residences: condition	0.75	0.19	-0.08	-0.15	0.21	0.13
Other residences: accommodation capacity	0.66	0.08	0.19	-0.17	0.30	0.12
Other residential: income potential	0.20	0.17	0.11	-0.08	0.77	0.12
Infrastructure: capacity	0.59	-0.18	0.28	0.37	0.27	0.25
Infrastructure: historical character	0.23	0.16	0.03	0.12	0.65	0.15
Electricity supply	0.12	-0.10	0.16	0.00	0.18	0.69
Infrastructure: irrigation	0.23	-0.11	-0.02	-0.04	0.08	0.76
Infrastructure: irrigation capacity	0.25	-0.21	-0.07	-0.06	0.03	0.75
Infrastructure: game proof fence	0.12	0.23	0.04	0.12	0.60	-0.43
Aesthetics: presence of natural scenery	0.02	0.75	0.08	0.03	0.32	-0.17
Aesthetics: view from property	0.06	0.86	0.01	-0.14	0.27	-0.08
Aesthetics: presence of indigenous vegetation	0.01	0.51	0.06	0.34	0.16	-0.31
Aesthetics: presence of trees	0.24	0.79	-0.18	0.11	-0.01	0.26
Aesthetics: rural surroundings	-0.07	0.56	0.07	-0.04	-0.28	0.19
Outdoor recreation potential	0.22	0.78	0.09	0.07	0.27	-0.12
Water availability for income generating activities other than irrigation (tourism)	0.11	0.15	0.37	-0.62	0.34	-0.01
n = 48						

* Significant factor loadings in bold (explains a correlation of 50 percent and higher with each factor).

Factor 4 indicated high correlation between the variables related to privacy and grazing capacity and posed challenges to the determination of a collective theme for this factor. The Karoo is traditionally a small stock farming area. The grazing capacity is therefore an important

consideration in keeping animals for both lifestyle and production purposes. Theft of small stock is a problem and one reason for the high correlation between privacy and grazing capacity could be the security factor. Land owners prefer secluded farms in order to decrease the possibility of theft. For this reason the factor was called “Security”. Game is not as prone to theft as small stock, but one would expect other variables, such as the potential to keep game and water availability for animal and human consumption, to be equally important as grazing capacity. This is not the case, as indicated by low factor loadings.

The variables in Factor 5 are associated with tourism. The importance of game proof fencing, accessibility of the property for tourism activities and income generation capacity of residential units for tourism purposes, as well as the historical character of the main residence and non-residential infrastructure had high factor loadings. Many tourists are attracted to the specific building style of the Karoo and the absence of electricity and cellular phone reception in order to experience the natural scenery and wildlife within its specific character. Many lodges and hunting camps have sprung up in the area and farms need to have the appropriate facilities to accommodate both hunters and tourists, such as game proof fences. This factor relates to both lifestyle and production motivations, because tourists and lifestyle buyers appreciate the aesthetics, and farmers can diversify their practices for tourism, in order to generate income.

Factor 6 is called “Agricultural production potential” and is important to production oriented buyers. High factor loadings are evident with variables such as production potential, soil quality, climate, condition and the possibility of expansion of existing cultivated areas, water availability for irrigation, electricity supply and the presence and condition of irrigation infrastructure. This relates well to existing literature regarding the productive characteristics that influence agricultural property prices.

It was expected that variables such as the aspect of the farm being north or south facing, water availability for human and animal consumption, size of the property, presence of labour rights and grazing capacity would also record high factor loadings, but they did not. The sun scorches vegetation on north facing slopes, but the relative flatness of the Karoo, as well as the low grazing capacity in general most likely contributed to the insignificance of this variable. Water availability is possibly already captured under the availability of water for irrigation purposes (Factor 1). The presence of labour rights is also a controversial issue in extensive areas, and this could be one reason why this variable is not included in the production potential factor. Another reason could be

that extensive small stock farming does not require many labourers and that living rights are thus not an important issue for land owners.

It is not clear why the size of properties was not correlated with the production potential or lifestyle factors (Factor 2 and 6), as large tracks of land are needed to form an economic unit for farming purposes, while lifestyle buyers were expected to prefer smaller farms. Size was also a prominent consideration for buyers interviewed during the case study. Buyers are possibly aware of the fact that the grazing capacity is low and that large tracts of land are needed for most farming activities.

A test of sphericity was also done for the extensive area in order to determine whether sufficient correlations existed between variables. The determinant of the correlation matrix among the variables (items) is equal to $3.6216 \cdot 10^{-33}$, with the p-value for the test for sphericity being less than 0.001. Thus there were highly significant relationships among the regressor variables (see section 4.4.2.2 on the regression analysis) in the extensive area as well, which justified the use of the factor analysis even though the sample size was small. These relationships could be investigated further in studies with bigger sample sizes. Although the sample size for the factor analysis in the extensive area was only 48 and samples size of a 100 or more is preferable, the high significance of the sphericity test indicated that a factor analysis was in fact a meaningful exercise. This was an exploratory factor analysis and the limitation of a confirmatory factor analysis that the total number of cases divided by the number of factors should preferably be more than 5, was not applicable.

The variables indicated in the best subsets regression (general agricultural potential, size of the main residence and outdoor recreation potential) are classified under different factors in the factor analysis (see section 4.4.2.2 and Table 16), which imply that they are not correlated to each other and signify different aspects/ features of farms. The variables indicated in the logistic regression results (size of the main residence, presence of irrigation infrastructure and presence of natural scenery) are also classified under different factors in the factor analysis, but there are overlaps if the variables of both regressions are taken together. The presence of irrigation infrastructure and general agricultural production potential fall within the same factor (Factor 6 named production potential), while outdoor recreation potential and presence of natural scenery fell within Factor 2 (aesthetic beauty). For this reason the factor analysis results also serve as a confirmation of the regression results.

4.5 Conclusion

The outcomes of the qualitative and quantitative methods were discussed in this chapter. The purpose of using the qualitative method was to determine whether valuers and lifestyle buyers interpreted the value attributes of farms bought for lifestyle purposes differently. From the qualitative findings it was concluded that there were indeed differences, as valuers tended to focus on attributes associated with agricultural potential when valuing farms bought for lifestyle purposes, because of their familiarity with these attributes and farmers as typical buyers of agricultural properties, as well as problems experienced with the measurement of lifestyle attributes. These findings were supported by the quantitative phase where it was shown statistically that two groups of buyers were operational in the agricultural land market and that they emphasised different attributes of farm land which attracted them. Valuation reports accentuated production characteristics that were measurable, which corresponded with the features required by production oriented buyers.

The quantitative analyses were undertaken within an intensive and extensive area, with the objective of determining whether the value attributes of farms as emphasised by lifestyle and production oriented buyers differed statistically. The demographic profile of lifestyle buyers in both areas differed from production oriented buyers with regard to their main source of income (secured outside agricultural sector) and occupations. Multiple regression analyses specified that in the intensive area variables related to the location of a farm (its setting), the opportunity for water recreation activities and the presence of views (aesthetics) were predictors of lifestyle considerations. The soil quality and presence of permanent living rights were variables likely to be associated with production oriented buyers. In the extensive area the agricultural potential of the property, together with the presence of irrigation infrastructure were predictors of farms bought for production reasons, while the size of the main residence, the property's suitability for outdoor recreation activities and the presence of natural scenery from an aesthetic point were the most likely predictors of lifestyle considerations.

Factor analyses carried out in order to reveal relationships between variables led to the classification of the following six main themes in the intensive area: aesthetic beauty, production potential, location, infrastructure, recreation opportunities and irrigation. Aesthetic beauty and recreation opportunities were associated with lifestyle considerations, while irrigation and production potential were associated with production motives. The infrastructure and location themes could be important for both lifestyle and production motivations. The main classifications for the extensive area were

infrastructure, aesthetic beauty, access, security, tourism opportunities and production potential. Aesthetic beauty was associated with lifestyle considerations and production potential with production purposes, while the four remaining factors could be important for both groups of buyers.

The breakdown of the concept 'aesthetic beauty' relating to agricultural properties was investigated. Buyers in both areas regarded views of mountains, valleys, water and natural scenery with the absence of power lines as "beautiful", while natural scenery was associated with pristine environments, mountains, water (streams, rivers), birdlife, space, clean air and tranquillity. A summary of the characteristics associated with lifestyle buyers in both areas evident from the statistical analyses is provided in Table 17.

Table 17: Summary of characteristics associated with lifestyle buyers in the intensive and extensive area

Characteristic	Intensive area	Extensive area
Location: proximity to nearest city	√	√
Location: proximity to nearest town	√	
Location: proximity to nearest airport	√	
Location: proximity to nearest major road	√	
Location: travelling time	√	√
Access: for tourists	√	
Position: setting (in valley, against mountain)	√	√
Position: private	√	√
Production potential: soil quality	√	√
Production potential: meso climate	√	√
Production potential: size of property	√	√
Production potential: grazing capacity		√
Production potential: game production		√
Topography: varied		√
Water availability: human and animal consumption	√	√
Water availability: irrigation	√	
Residential infrastructure: style of main residence	√	
Residential infrastructure: size of main residence	√	√
Residential infrastructure: condition of main residence		√
Residential infrastructure: accommodation capacity of other residential units	√	
Residential infrastructure: condition of other residential units		√
Permanent living rights for labourers	√	
Non-residential infrastructure: capacity	√	
Non-residential infrastructure: power supply	√	
Non-residential infrastructure: condition	√	√
Non-residential infrastructure: condition and capacity of irrigation infrastructure	√	
Non-residential infrastructure: game fencing		√
Aesthetics - presence of natural scenery including:	√	√
Mountains	√	√
Peace and quiet (tranquillity)	√	√
Clean, fresh air	√	√
Wildlife		√
Openness and space	√	√
Streams and waterfalls	√	√
Valleys, gorges and ravines		√
Rock formations and rock faces		√
Big trees, forests and bush	√	
Pristine environment with vegetation typical of the area	√	√
Birdlife	√	√
Rivers, river frontage and riparian areas	√	√
No sign of civilisation (such as roads and buildings)		√

Table 17: (continued)

Characteristic	Intensive area	Extensive area
Aesthetics: presence of river, stream, river frontage	√	√
Aesthetics: presence of mountain	√	√
Aesthetics - presence of beautiful view, including:	√	√
View of vineyards	√	
View of natural veld		√
View of indigenous vegetation (such as fynbos, karoo bush)		√
View of trees	√	
View of mountains and mountain ranges	√	√
View of valleys, gorges and ravines	√	√
View of water such as a river, stream or dam	√	√
360 degrees uninterrupted views (i.e. no obstructions in terms of human-made structures or anything else that could obstruct the view)		√
View of natural scenery	√	√
No Eskom power lines in sight	√	√
No sign of civilisation (e.g. roads, buildings)		√
View that stretches to the horizon, such as never-ending karoo plains		√
View of a well-kept garden	√	
Aesthetics: presence of indigenous vegetation	√	√
Aesthetics: presence of trees	√	√
Aesthetics: presence of dam or dams	√	√
Aesthetics: presence of rural surroundings	√	√
Possibility for outdoor recreation activities	√	√
Possibility of water recreation activities	√	
Status	√	

5. CONCLUSIONS, SUMMARY AND RECOMMENDATIONS

5.1 Conclusions

This study identified the need to determine the value attributes considered by buyers purchasing agricultural properties for lifestyle purposes, to test the belief that agricultural land valuers used predominantly production related attributes in their determination of the value of farms bought for lifestyle purposes, even though these characteristics differed from those considered by production oriented buyers. The market sales comparison approach was used as point of departure, where it is of paramount importance that valuers are able to think like a typical buyer and seller. The presence of lifestyle inspired buyers in the agricultural land market makes agricultural land valuations more demanding as this requires different interpretations of the same farm and complicates the choice of a single HBU. The continued use of familiar conventional farming attributes by valuers when valuing farms where lifestyle motivations are present, and the omission of less measurable characteristics imply that the market sales comparison method – which relies on the simulation of the thought processes of a buyer and seller with regard to the attributes that bear value – suggests that the valuation cannot be executed accurately. Valuers talk about lifestyle buyers in general, but do not know how to treat them in valuations. This study confirms the discrepancy between the reasoning of valuers and the typical lifestyle buyer and provides more clarity about the attributes of agricultural properties that bear value to lifestyle buyers.

For these reasons this study set out to resolve two hypotheses. The first was to ascertain whether valuers apply mostly farming related value attributes when valuing farms bought primarily for lifestyle purposes. This research was carried out qualitatively by means of a case study. The second phase was to establish whether the interpretation of the value attributes of farms as appreciated by lifestyle and production oriented buyers differed. A survey was undertaken amongst buyers of farms within an extensive and an intensive area in the Western Cape Province.

Analyses of valuation reports and interviews with lifestyle buyers showed that their emphasis on the value attributes of agricultural properties differed. Valuers continued to emphasise attributes traditionally associated with commercial farming as HBU and farmers as the typical buyers of agricultural properties. In contrast, lifestyle buyers put emphasis on the aesthetic attractiveness of farms in terms of the style or historic character of the main residence, natural scenery, tranquility, rural setting, suitability for outdoor recreation activities and location. Some attributes were

important to both lifestyle and production oriented buyers, but for different reasons. Therefore valuers included the applicable characteristics, but for the wrong reasons, which resulted in comparisons not reflective of the lifestyle buyer as typical buyer of a farm. Therefore the hypothesis that valuers apply mostly production related value attributes when valuing farms bought primarily for lifestyle purposes, was not rejected.

This finding was supported further in the quantitative phase, where it was shown that there were indeed two groups of buyers who emphasise different characteristics and that farming oriented buyers did in fact emphasise characteristics related to agricultural production, which were easier to quantify. The same characteristics dominated in valuation reports, even in valuations of properties where lifestyle considerations were present as indicated by buyers of such properties. The qualitative and quantitative investigations were therefore used together to support and confirm findings, which ensured that the study benefited from the synergy of a mixed methods approach.

Results from the quantitative phase indicated that the influence of lifestyle buyers on the agricultural land market was substantial: more than half of the survey respondents in the study indicated that they were motivated by lifestyle considerations (65 percent in the intensive and 52 percent in the extensive area). For this reason it is imperative that lifestyle buyers be recognised in valuations of agricultural properties. Valuers need to expand their thought processes to include more than just the agricultural production side, in order to reflect the agricultural land market truthfully, which would assist in informed decision making.

A demographic profile of lifestyle buyers was assembled to provide more information regarding this type of buyer. They were usually high net worth individuals with their main income derived outside the agricultural sector, usually in the business sector. In general, lifestyle buyers were well educated and their motivations for purchasing agricultural properties were diverse and they were not dependent on the agricultural production from the property purchased for their livelihood. For this reason the agricultural potential of the farm was not as important as its lifestyle potential. The position and accessibility of properties as regards distance to towns were important in order to gain the best of two worlds - a rural lifestyle combined with employment opportunities in town, with access to amenities. Most lifestyle buyers were South Africans who were predominantly English speaking in the intensive area, but mainly Afrikaans speaking in the extensive area. In the intensive area more than half used the property acquired as their main residence, while lifestyle buyers in the extensive area used the farm for holidays.

A number of characteristics was universally important to all buyers in both the intensive and extensive areas. Water availability for human and animal consumption was an essential consideration for all, while other important attributes included privacy, accessibility of the property in terms of travelling time, its size and the aesthetic beauty - the presence of natural scenery and trees. There were also significant differences between the considerations of lifestyle and production oriented buyers when purchasing agricultural properties, and for this reason the hypothesis that the interpretation of the value attributes of farms as appreciated by lifestyle and production oriented buyers differed, was not rejected.

In the intensive area variables such as the setting of the farm, together with views and water recreation opportunities best explained purchases of agricultural properties for lifestyle reasons, while soil quality and the presence of labour rights were associated with production oriented buyers. It follows that lifestyle buyers emphasised attributes associated with the aesthetic beauty and recreation potential of farms rather than the productive capacity and income potential of farms, while these attributes were important to buyers with farming prospects in mind. The characteristics that appealed to lifestyle and production oriented buyers in the intensive area were in general not far removed from each other, possibly because most buyers in this area have a strong lifestyle orientation. The area's standing as an exclusive and internationally acclaimed wine producing region, with spectacular views and scenery and position close to Cape Town attracts these buyers.

The attributes that were most likely to be associated with production motivated buyers in the extensive area included the general agricultural production potential and the condition of irrigation infrastructure of a farm, while an adequate sized main residence, outdoor recreation opportunities and the presence of natural scenery were likely to attract lifestyle buyers. There was a clear division between agricultural potential considerations (which appealed to production motivated buyers) and lifestyle considerations related to aesthetic and recreation purposes (which appealed to lifestyle buyers).

The nature of the term 'beautiful' is elusive and subjective and therefore it is problematic for valuers who need to be able to think like the typical buyer and make comparisons between the characteristics of properties associated with aesthetic beauty for the estimation of market value. For this reason respondents' understanding of the terms 'beautiful view' and 'natural scenery' were explored in greater detail. Buyers in the intensive area associated a beautiful view with vineyards, mountains and well kept gardens, while buyers in the extensive area perceived views of indigenous vegetation, natural scenery and mountains as beautiful.

In the intensive area buyers described natural scenery as the presence of mountains, birdlife, openness and space, tranquillity and clean air. This was confirmed by buyers in the extensive area, who expanded the description of natural scenery to include the presence of pristine environments, valleys, rivers and wildlife. Lifestyle buyers both in the intensive and extensive area included the presence of water such as streams, waterfalls and rivers in their concept of natural scenery.

The attributes specified in this study are intended to act as a guideline for valuers by providing a check list of lifestyle considerations to be used in the valuation of agricultural properties, as a decision support tool to assist them by directing their thought processes. It is not possible to rank attributes according to their importance. The effect of emergence, where the interaction of attributes creates a different product that attracts buyers, means that attributes cannot be isolated. At the same time the presence of one variable may offset the influence of another. For example, the negative impact of an inaccessible road to a property might be offset by the positive effect of the privacy and seclusion it offers. For these reasons it must be stressed that there is no ultimate solution for the measurement problem because there are limits to the levels to which attributes associated with aesthetic beauty can be made more concrete. These attributes can be identified, but their subjective nature makes measurement of intensities impossible. At the same time aesthetic beauty is localised, as demonstrated by the statistics, which indicated that vineyards appealed to 80 percent of all buyers in the intensive area as part of a beautiful view, while close to zero percent of buyers in the extensive area perceived them as part of a beautiful view.

The main contributions of this study are summarised as follows:

- The value attributes that appeal to lifestyle buyers differ from those emphasised in valuation reports. Quantitative analysis revealed the dominance of farming related value attributes in valuers' interpretation of agricultural properties bought primarily for lifestyle purposes.
- Lifestyle buyers think differently about the value attributes of agricultural properties from production oriented buyers. They are different types of buyers with different motivations, interpretations and priorities from production oriented buyers. Lifestyle buyers are not dependent on farming income and thus are less concerned about the productive characteristics of agricultural properties. This was confirmed statistically in an extensive and intensive area within the Western Cape Province in South Africa with tools such as analyses of variance, regressions and factor analyses.
- Value attributes associated with lifestyle buyers were identified for the purpose of being used as a guideline by valuers when they undertake agricultural land valuations.

- A more practical content was provided for the concept “beauty” as it relates to agricultural properties, by exploring what buyers of farms associated with a ‘beautiful view’ and ‘natural scenery’.
- The utility of a mixed method approach when dealing with complex issues was demonstrated.
- The complexity surrounding HBU decisions when different use options are possible and the importance of the use of multiple perspectives when valuing agricultural properties where the HBU is uncertain was emphasised.

5.2 Summary

The introduction and orientation to the research problem, as well as the hypotheses of this study was discussed in Chapter 1. Rural land possesses many characteristics that bear value to its owners. Traditionally, agricultural land was regarded mainly as a production factor and valuers relied on a set of value attributes related to agricultural production as the primary determinants of its market value and farmers as typical buyers, in their decision of a property’s HBU. These characteristics are objective, tangible and related to the income generating capacity of the property. The emergence of a multi-functional rural land market with alternative uses of agricultural land, such as for lifestyle purposes, has transformed this conception, as lifestyle inspired buyers often focus on a wider range of attributes. These characteristics are not primarily related to the property’s income generating capacity, but are more intangible and subjective and therefore create a measurement problem for valuers of agricultural land.

This study aimed to fill the gap left by the transition to a multi-functional agricultural land market by exploring the following hypotheses:

- Valuers apply mostly farming related value attributes when valuing farms bought primarily for lifestyle purposes.
- The applicable value attributes of the lifestyle motivated buyer diverge from the buyer who is primarily production oriented and this can be statistically regressed.

Chapter 2 presented an overview of applicable valuation theory and provided the theoretical basis for the research problem, against the background of the trend towards a multi-functional rural land market where a range of alternative non-agricultural uses for agricultural land is evident.

The market sales comparison method is the preferred approach for the valuation of urban and agricultural properties. The concepts market value and HBU form the foundation of this method, while knowledge regarding the applicable characteristics that bear value for buyers and sellers are also important. The comparative sales method maintains that a property can have only one value at a specific point in time (market value) which is derived from the HBU. The HBU is defined as the use that generates the highest profit or satisfaction for the typical buyer (a mental construct used by valuers) at a specific moment in time. It follows that the value attributes of the property provide a vital link that assist valuers in their decision of the HBU and implies the acceptance of a set of related value attributes for a typical buyer. The decision of the HBU is critical, as it provides direction in the choice of properties to include in value comparisons. However, the heterogeneous character of land and diverse buyer motivations complicate the decision of a single HBU.

The complex and highly theoretical definitions of HBU and market value have been challenged by valuers. Continued criticism has been aimed at the neo-classical assumptions of perfect competition, complete information, and rational human thought, which do not reflect actual human behaviour and are considered to be unrealistic. Early definitions of market value described it as the highest price at which a property could be sold on the open market, while later definitions portrayed it as the most probable price for such a property. Initially HBU was defined as the most profitable or optimum use of a property in terms of income, which was expanded to include the use that represented the highest land value. The concept that the HBU is the use that maximises either income or satisfaction leads to confusion, as the HBU of an agricultural property could be either for production (income maximisation) or for lifestyle (satisfaction maximisation) purposes. At the same time, the view that one use is the highest and best is embedded in the principle that a property can have only one market value at a specific point in time. This is problematic in a multi-functional environment where different value attributes are connected to alternative uses and different interpretations of the same property.

It was argued that the terms market value and HBU should be replaced by the concepts most probable price (MPP) and most probable use (MPU). These concepts acknowledge the risk and uncertainty surrounding the choice of a single use and value as the best, and create room for the investigation of alternatives. MPU and MPP point towards the most likely use and price within a range of possible uses and values, thereby revealing that buyers sometimes make sub-optimal decisions as a result of lack of information and recognising that the use that yields the highest income is not necessarily the use that yields the greatest value.

At the same time, MPU and MPP create a statistical dimension to valuation, as they suggest the most probable selling price (use) within a distribution of potential selling prices (uses). The use of statistics for valuation purposes can be challenging, as sales data are not normally distributed, are limited and insufficient for the purposes of drawing meaningful statistical conclusions. The collection of data for rigorous statistical analysis is a cumbersome, expensive and time consuming process that few valuers can afford. The use of the concept HBU should be maintained, but the complexity surrounding multiple land uses should be acknowledged. This requires valuers to “suspend judgment” regarding the choice of HBU and admit the importance of multiple perspectives when dealing with multiple use properties.

A mixed method research strategy that consisted of a qualitative phase followed by a quantitative phase was pursued to investigate the hypotheses, as described in Chapter 3. The complexity associated with agricultural property valuations where lifestyle considerations were present and the exploratory nature of the research made it well suited to a mixed method design, where the open-ended nature of qualitative research provided an opportunity for the identification of new, unanticipated considerations, which could be confirmed quantitatively through statistical analysis. For this reason the strengths of both qualitative (identification of new considerations) and quantitative methods (confirmation of statistical significance of newly identified considerations) were combined in order to provide more solid and comprehensive results. At the same time the use of mixed methods assisted in between-method triangulation, which is based on the principle that the confirmation of a hypothesis through two or more independent measurement processes decreases uncertainty in its interpretation. The use of the qualitative and quantitative methods led to multiple inferences that validated each other and offered stronger inferences. The drive of the research was predominantly inductive, for this reason the qualitative phase formed the basis of the mixed method.

The qualitative phase took the form of a multiple holistic case study and its objectives were to determine whether the value attributes considered by lifestyle buyers differed from those used by valuers in valuation reports, and to identify ‘new’ attributes considered by lifestyle buyers. These attributes were then used in the development of a questionnaire for a survey undertaken amongst buyers during the quantitative phase. The benefit of case studies is that complex phenomena can be explored in depth, and multiple sources of evidence can be drawn upon.

Sampling procedures were based on replication logic, based on its contribution towards a better understanding of the considerations of lifestyle buyers in their decision to buy farms. Variation between cases with regard to the type of farm and valuers (e.g. different age and level of

experience) was crucial and cases were added until a point of theoretical saturation was reached, where the inclusion of more cases provided minimal additional information. In all, 16 cases were included: eleven were in the Western Cape Province, while the rest were situated in the Limpopo, KwaZulu-Natal and Mpumalanga Provinces. The expansion of the case study beyond the borders of the Western Cape Province was done to gather more information regarding lifestyle buyers' considerations across space. Semi-structured personal interviews were conducted with all parties involved in a transaction, where respondents were asked which characteristics of the property appealed to them most. This was complemented by a site visit to the farm. The gathering of data from a variety of sources assisted in data triangulation.

Valuation reports and interviews were transcribed and analysed with assistance from computer assisted qualitative data analysis software (Atlas.ti). Software assisted with the organisation of qualitative data, but analysis still relied on the researcher's own judgment and interpretation. Care was taken to address issues relating to construct and external validity, together with reliability. All procedures followed and evidence collected was documented in a case study protocol and data base.

The identified characteristics associated with lifestyle buyers were included in a questionnaire which was sent via fax, e-mail or regular post to buyers of agricultural properties in both an intensive and extensive area within the Western Cape Province. The objective of the survey was to determine statistically whether the considerations of lifestyle and production oriented buyers differed. Buyers were identified from the national Deeds Office data base of agricultural properties transferred from January 2005 to October 2007. The intensive area corresponded with the Registration Divisions of Stellenbosch and Paarl, which is situated in the Cape Winelands District municipality. The extensive area included the Registration Divisions of Beaufort West, Laingsburg and Ceres and was situated within the Central Karoo District Municipality. Only arms' length transactions of properties greater than 5ha in the intensive area and greater than 100ha in the extensive area were targeted to avoid the inclusion of properties for which the determination of the HBU was more obvious (e.g. the HBU of a smallholding was most likely for lifestyle reasons).

Numerous problems were experienced in contacting buyers and enticing them to participate. In total 290 questionnaires were sent out (181 in the intensive area and 109 in the extensive area); 123 were returned (64 within the intensive and 59 in the extensive area). The response rate was 35 and 54 percent in the intensive and extensive areas respectively, which was lower than expected, as all respondents were personally informed of the survey and various follow-ups were done.

The qualitative analysis showed that valuers continued to focus on the conventional farming value attributes when valuing farms for lifestyle purposes and valuation reports were dominated by attributes associated with agricultural potential. Although they were aware of lifestyle considerations as evident from personal interviews, valuers steered away from including intangible attributes as they did not know how to measure these characteristics. The continued practice of valuation on a Rand per hectare basis resulted in valuers struggling to balance agricultural and market value when doing market sales comparisons, which left them in a vulnerable position. As a result the first hypothesis that valuers and lifestyle buyers differed with regard to their emphasis on the attributes of agricultural properties valued, was not rejected. This finding was supported further in the quantitative phase, where it was shown that there were indeed two groups of buyers who emphasised different characteristics. Farming oriented buyers emphasised characteristics related to agricultural production and the same characteristics dominated in valuation reports, as these characteristics were more easily quantifiable and familiar to valuers. The qualitative and quantitative investigations were therefore used together to support and confirm findings, which ensured that the study benefited from the synergy of a mixed methods approach.

The survey results indicated that more than half of agricultural properties in both the intensive and extensive areas were purchased for lifestyle reasons. Demographic statistics of lifestyle buyers revealed that they were likely to be high net worth individuals earning more than R400 000 per annum, which was generally secured outside the agricultural sector. They were well educated and most pursued jobs in the business and professional sectors. Their average ages varied between 47 and 50 for the intensive and extensive area. While more than half of lifestyle buyers in the intensive area used the property purchased as their main residence, none of the extensive area lifestyle buyers lived on the farm purchased, but used it for weekend and holiday retreats. Significant differences between lifestyle and production oriented buyers in both areas were recorded only in respect of their main source of income and occupation.

Although some characteristics of farms were common to both lifestyle and agriculturally inclined buyers, there were also some fundamental differences. Purchases for lifestyle reasons were best explained by variables such as the position of a property in terms of its setting within a valley and on a mountain slope, the availability of water for recreation activities and views for aesthetic purposes. Similarly, the variables that were statistically significant in explaining the considerations of production oriented buyers included the position of the property in terms of being private and secluded, its soil quality and the importance of legal permanent living rights for labourers. These variables were in line with those traditionally sought for agricultural production purposes as

documented in hedonic pricing literature. For this reason the second hypothesis - that applicable value attributes of the lifestyle motivated buyer differ from the buyer that is primarily production oriented - was not rejected.

Factor analyses were carried out to identify and order the characteristics associated with lifestyle and production motivated considerations. The intensive area factor analysis consisted of six factors, which explained 61 percent of the total variance between factors. The factors were organised into the following themes (in hierarchical order): aesthetic beauty (with setting, aspect, natural scenery, presence of a mountain, view, trees, rural surroundings and outdoor recreation opportunities being the variables with high factor loadings that explained 28 percent of total variance), production potential (variables with high factor loadings included meso climate, soil quality, agricultural potential, topography, condition and expansion capabilities of cultivated areas and irrigation capacity, that explained 10 percent of the total variance), location (including distance to city, town, major road and traveling time, explaining 8 percent of total variance), infrastructure, recreation activities and irrigation infrastructure.

Purchases for production purposes in the extensive area were best explained by the general agricultural potential of a farm and the serviceability of irrigation infrastructure. Conversely, a farm that provided a main residence of appropriate size, with the potential for outdoor recreation activities and aesthetic beauty in terms of natural scenery was most likely to be purchased by the lifestyle buyer. These buyers want a place to spend time with family and friends, while activities such as game viewing and hunting are popular recreation activities.

Factor analysis in the extensive area indicated that variables could be grouped into six factors with the following themes (in hierarchical order): infrastructure (which explained 22 percent of total variance and included variables such as the condition and capacity of residential and non-residential infrastructure), aesthetic beauty (including natural scenery, varied topography, presence of mountains, views, indigenous vegetation, trees, dams, rural surroundings and outdoor recreation potential, which explained 15 percent of the total variance), accessibility, security, tourism attractions and production potential. In all, 61 percent of the total variance was explained.

The intrinsic value of farm attributes, such as their aesthetic beauty, attracted lifestyle buyers, but the nature of these characteristics is intangible. This study attempted to identify these elusive considerations, by determining the practical contents of the aesthetics of agricultural properties, as represented by natural scenery and beautiful views.

Views of mountains and mountain ranges were regarded as beautiful by all respondents in the survey. In the intensive area 80 percent of lifestyle and production motivated buyers thought that views of vineyards were attractive, but totally the opposite was true for lifestyle and production oriented buyers in the extensive area, where this percentage fell to almost zero. Lifestyle buyers in both areas agreed that views of valleys and water (streams, waterfalls), together with the absence of power lines were appealing, while they were joined by production oriented buyers in the extensive area in their outlook that natural scenery was also striking. In cases where agricultural land is expropriated for power lines, the impact on production is investigated, but the impact on attraction for lifestyle purposes is ignored. This study confirms the importance of an uninterrupted view for lifestyle buyers. Views of natural veld with indigenous vegetation were attractive to both types of buyers in the extensive area. Lifestyle and farming oriented respondents in both areas associated natural scenery with mountains, tranquillity ('peace and quiet'), openness and space, clean fresh air and a pristine environment with vegetation typical of the area and abundant birdlife.

5.3 Recommendations

This study identified various attributes considered by lifestyle buyers in their decision to purchase agricultural properties. These attributes could be used as a guideline to assist valuers when doing valuations where lifestyle considerations are present. The intangible and subjective nature of attributes associated with aesthetics, however, does not allow its importance to be ranked.

Valuation practices require an early choice of the HBU for a property in order to guide the valuation process: a valuer must first and foremost decide on the HBU, after which most of the valuation work is carried out. With properties where alternative uses are probable and the HBU is not clear-cut, the opposite *modus operandi* might be more appropriate: the valuer should postpone the choice of the HBU until the property has been viewed from all applicable perspectives. The choice of an applicable HBU thus follows after it has been viewed through different 'lenses'. A multiple perspective approach to valuation is proposed.

The focus of this study was to reinterpret the value attributes of agricultural land for the valuation of farms bought for lifestyle purposes. Further research is needed to investigate how the characteristics identified as important by lifestyle buyers of farms could be applied within a valuation context. This necessitates a departure from the current emphasis on more easily quantifiable characteristics.

This study was subject to a number of limitations. The survey was conducted on a small number of respondents, because of the limited number of observations. The highly significant relationships among the regressor variables and high significance of the sphericity tests, however, need to be explored in further studies where bigger sample sizes are used, by either expanding the study area or going further back in time. Conversely, this study focused on the characteristics associated with lifestyle buyers, but did not look at agricultural land prices, which would also be of assistance to valuers.

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Annexure 1: Summary of selected Hedonic Pricing studies done on agricultural land, urban fringe and land associated with natural amenities

Author	Description of study	Independent variables	Results/ conclusions	R ²
AGRICULTURAL PROPERTIES				
Castle and Hoch (1982)	Farm real estate price components: 1920 - 78	Building costs on rented/ owned farm estate	Farm real estate price not fully explained by earnings in agricultural production.	
		Debt		
		Inflation rate		
		Price level embedded in interest rate		
		Market interest rate		
		Real internal rate of return		
		Real growth rate in price of farm		
		Gross/ net rent on rented/ owned farm		
		Time sequence		
		Taxes on rented/ owned farm real estate		
		Expected price of farm real estate		
		Earnings component of capitalised value of net rent on owned real estate		
		Real capital gains		
		Gains/losses from changes in value of debt		
King and Sinden (1994)	Four models of price formation, incorporating search and bargaining concepts, as well as four equation model of buyer-seller behaviour in Australian farm market	Shortest road distance	Final prices closer to buyer's bid prices than seller's offer prices, buyers valued soil conservation and proximity to town most, then productivity and size.	
		Productivity		
		Size		
		Land condition		
		Slope		
		House present * (+)		
		Age of seller		
		Seller has children that can take over		
		Pressured sale		
		Remained in farming		
		Shortest road distance* (+)		
		Productivity		
		Size		
		Land condition * (+)		
		Slope		
		House present		
		Age of buyer		
		Buyer has children that can take over		
		Farm adjacent to one already have		
		Maximum buyer bid		
		Seller: initial offer price		
		Bargaining strength of buyers and seller		
		Number of potential buyers according to buyer		
		Real estate agent involved		
		Number of properties considered by buyer		
		Number of counties where have searched		
		Time buyer has been searching		
		Sales price		
		Buyer's initial offer bid		
		Buyer's maximum bid		
		Seller's reservation price		
		Seller's offer price		

		Size Productivity Presence of river frontage Land condition Slope Road distance between two nearest towns Presence/ absence of house Age Children continue farming Farm adjacent to other property Age Children continue farming Pressured sale Number of potential buyers Real estate involved Number of properties considered by buyer Number of areas buyer searched in Number of months buyer searched		
Feng <i>et al.</i> (1993)	Contributions of site characteristics to value of agricultural land, with different combinations of characteristics in regions within Washington State	Size * (-) Monthly time index Gross income % of total acres that is pasture Dummy for county Distance in miles to nearest town * (-) Average land capability class * (+) Length of windbreak * (+) Number of stalls in milking parlour Age of milking parlour Irrigation systems * (+) Size of barn * (+) Age of barn * (-) House size * (+) House age Assessed value of machinery per acre/ CPI*	Agricultural characteristics important in determining price of properties within Washington State.	
Ejimakor (1995)	Impact of socio-economic variables on farmland holdings in North Carolina	Years of farming experience * (+) Age Education in years Value per acre * (-) Value of non-farm assets *(-) Farm debt Net farm income * (+) Method by which land was acquired Residence (on/ off farm) Type of farmer Gender Race County Interaction term between income and different counties Marital status Dummy for health status	Value of farmland, net farm income and value of non-land farm assets significant predictors of farmland ownership.	0.71

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
Maddison (2000)	Hedonic analysis of agricultural land prices in England and Wales	Number of acres Private transaction Number of bedrooms * (+) Cottages * (+) Milk quota * (+) Vacant possession * (+) Population density * (+) Soil quality * (+) Climate * Average elevation* (-)	Climate, elevation and soil quality, as well as structure attributes are all important attributes of farm prices.	0.62
King and Sinden (1988)	Influence of soil conservation on farmland values – investigates relationships between land condition and land value, mix of models	Average slope Size * River frontage Productivity * % of area classified as arable Cost of conservation works* Soil loss Officials' rating for conservation works Area Presence or absence of house* Brick house or not Age of house Shortest distance between two towns* Not necessary Age Investment skill as rated by professional personnel Still farming Children take over farming operations Pressured sale	Better land sell for higher prices and soil conservation is important.	
Kennedy <i>et al.</i> (1997)	Look at homogeneous land market areas (8) to determine important characteristics for Louisiana rural land market	Size * (-) % of Cropland * (+) % pasture land * (+) % timberland * (-) Value of improvements * (+) Road frontage * (+) Distance to largest town * (-) % of mineral rights purchased * (+) Paved access road * (+) Reason for purchase: expansion, investment, establish farm, residence Presence of cotton, rice, sugar cane General soil type * (+) Parish population per square mile Parish average per capita income Parish net farm income	Use of GIS improved results, land values strongly influenced by income producing potential on farm.	

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
Pyykonen (2005)	Spatial analysis of factors affecting Finnish farm prices	Size	Incorporate GIS, land quality and structural change, as well as off-farm job-opportunities significant in price formation.	
		Lake, river, sea borders parcel * (+)		
		Average yield in region * (+)		
		Length of thermic growth period * (+)		
		Less favourable areas * (+)		
		Environmental scheme		
		Finnish access treaty		
		Common agricultural policy * (+)		
		Farm density * (+)		
		Manure density * (+)		
		Proportion of agricultural income to farm households		
		Proportion of special crops * (+)		
		Population density		
		Unemployment		
% of agricultural labour to total labour				
Vasquez <i>et al.</i> (2002)	Impact of farm and non-agricultural development factors on farmland values (farmland divided into small (<80 acres) and large parcels (>80 acres)) in South-Central Idaho	Size	Farmland values influenced more by farm factors than non-agricultural factors.	(<80) = 0.51 (>80)= 0.91
		Distance to towns with less than/more than 500 people		
		Elevation * (-)		
		Slope * (-)		
		Average land capability class * (-)		
		County population		
		Net farm income by county		
		Population of dairy cows		
		Type of irrigation		
		Year sale occurred		
		Presence of water bodies		
		Location: different counties		
Huang <i>et al.</i> (2006)	HPM of farmland values in Illinois	Productivity, neighbourhood, location and environmental considerations	Use of GIS improves model fit, Farmland values decline with ruralness, size, distance to Chicago and large cities, swine farm density and increase with soil productivity and population density, as well as personal income.	0.78 - 0.85 (Four specifications of model)
		Size * (-)		
		Land class		
		Soil productivity * (+)		
		Distance to Chicago * (-)		
		Beale urban-rural continuum code		
		Population density * (+)		
		Personal per capita income * (+)		
		Distance nearest city with population over 50 000 * (-)		
		Swine farm density		
Scale of swine operations				

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
Henderson and Moore (2006)	Looks at how wildlife recreation income is capitalised into farmland prices - wildlife recreation is unique because it does not necessarily lead to conversion of farmland. Checks if higher land values are coming from amenity value that wildlife provides (e.g. hunting, fishing) in Texas, USA	Crop receipts * (+)	Hunting leases and recreation income are capitalised into farmland values.	
		Livestock receipts * (+)		
		Government payments		
		Metropolitan areas * (+)		
		Non-metropolitan areas adjacent to metropolitan areas		
		Population density * (+)		
		Population growth * (+)		
		Geographical index (based on topography and water surface area)		
		Average hunting lease rate * (+)		
		Income from recreation service * (+)		
		Deer density * (+)		
Wise and Dover (1974)	Farm sales in Northern Georgia, with three sub-samples (agricultural, rapidly growing, and mountainous and forested counties)	Building value	Building value most important determinant of property prices, influenced more by potential use than actual use, demand for recreational use more explanatory in forestland than timber production potential, residential potential commands higher price, demand for rural land in growth areas for non-farm use.	
		Residential area		
		Purchase for retirement/ speculation/ summer home/ farming		
		Size		
		Distance to railroad		
		Seedlings and saplings		
		Maintenance		
		Land class		
		Ponds		
		Beef income		
		Dominant city population		
		Lake site		
		Distance to state park		
		Percent in grain		
		Lake frontage		
		Distance to state federal highway		
		Branches and/or springs		
		Rail distance		
		Closest town population		
		Site index		
		Percent grain acreage		
		Large pulpwood		
		County seat population		
Sale date				
Percent forest land				
Distance to county seat				
Distance to lake				

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
Lopez <i>et al.</i> (1994)	Uses supply-demand model that incorporates amenity benefits into model for optimal land allocation for the Northeast areas of USA	Agricultural rents *(D-) (S+) Population * (D+)(S-) Slope Elevation * (D-) Irrigation * (D+) Distance to various states * (S+) Per capita income Park area Total area * (S+) Agricultural land tax * (S-) Real estate tax * (S+) Variable for New England, Mid Atlantic	Agricultural land yields significant positive benefits, amenity-benefit determined using willingness-to-pay information.	
Schott and White (1977)	Regression of farmland values by land classes	Land classes * (+) Dummy for river frontage * (+) Dummy for land located next to interstate highway * (+)	More productive land classes impact positively on price per acre.	
Weerahewa <i>et al.</i> (2008)	Determinants of farmland values in Canada – objective is to determine the impact of changes in income from market and government payments on farmland values.	Net farm income Government payment * (+) Interest rate Population density * (+) Time trend Dummy for States	Farmland values seemed disconnected from adjusted earnings per acre. If a time trend is included government payments have no effect on land values; when the time trend is removed they have positive effect on land values.	0.88
Cotteleer <i>et al.</i> (2008)	A spatial bayesian hedonic pricing model of farmland values	Agricultural land reserve Fragmentation index Type of farming, Vacant land * (-) Distance to airport, town, major roads GDP * (+) Interest rates Elevation Size* (-) Hobby farm	Lot size, GDP and vacant land were very important in explaining farmland prices.	0.65

Annexure 1: (continued)

AGRICULTURAL PROPERTIES WITH AMENITY CHARACTERISTICS				
Author	Description of study	Independent variables	Results/ conclusions	R ²
Shrestha and Alavalapathi (2004)	Effect of ranchland attributes on recreational hunting in Florida	Size under lease * (-)	Trees and vegetation have positive impact on hunting revenues.	
		Parcel size representing small parcel of 1000 acres or less		
		Ranchland area under trees and vegetation cover % * (+)		
		Trees and vegetation cover interacted with wetland/ stream variable * (-)		
		Distance from nearest city to ranch * (+)		
		Number of years ranchland has been under hunting lease * (+)		
		Max number of people on hunting lease		
		Size		
		Cattle herd size		
		Creek/ stream area %		
		Forest area %		
		Wetland area %		
		Improved pasture area %		
		Number of wildlife seen		
		Distance (Miles)		
		Age		
		Education		
% Male				
Family size				
Ranch experience				
Household income				
Bastian <i>et al.</i> (2002)	Environmental amenities and agricultural land values with GIS - GIS used to measure recreational and scenic amenities associated with rural land (wildlife habitat, angling, scenic vistas)	Productivity: grazing * (+)	GIS provides means to quantify amenity attributes, remote agricultural land that include wildlife habitat, angling opportunities and scenic vistas command higher prices than those for agricultural production.	0.60
		Productivity : irrigation * (+)		
		Total carrying capacity * (-)		
		% Animal Unit Months from railroad leases		
		Total Animal Unit Months from state ranges		
		Scenic amenities (Simpson's diversity index, e.g. diverse view) * (+)		
		Meters of stream on property divided by acres		
		Fish productivity		
		Fishing density per acre (meters of stream * fish productivity)		
		Total improvements * (+)		
		Elk-habitat * (+)		
		Distance to nearest town of 2000 habitants by road * (+)		
		Trend variable for time * (+)		
		Interaction variables: (Simpson's index* region) * (+) Fish value * region; elk * region		

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
Guiling <i>et al.</i> (2007)	The impact of recreation (hunting, fishing, bird watching, photography) on agricultural land values through inclusion of recreational income, deer density, population and income variables that underwrite non-agricultural uses (Oklahoma)	Size * (-)	Looked at impacts of agricultural, recreational and urban conversion on Oklahoma land values by estimating three models, Recreation with deer density, Urban influence with income, population density and growth.	
		Crop * (+)		
		Pasture * (+)		
		Irrigated crop * (+)		
		Timber * (+)		
		Waste		
		Recreation		
		Water * (+)		
		Deer density * (+)		
		Per capita income per county		
		Average county rainfall * (+)		
		Recreation income * (+)		
		Crop income/ crop acres		
		Livestock prices		
Population density				
Population growth				
Pope (1985)	Consumptive demand for agricultural land estimated in Texas	Return from agriculture (including government payments and income from hunting leases) * (+)	Population density, proximity to major metropolitan areas, quality of deer hunting and aesthetic differences explain majority of differences in rural land values.	0.85
		Number of white-tailed deer harvested per square mile above specified threshold * (+)		
		Estimated acres to agriculture per person		
		Population per square mile * (+)		
		Highway mileage from specified cities * (-)		
		Dummy variables for aesthetic appeal, based on topography, vegetation cover, access to ocean, dominant agricultural activity, etc.* (+)		
Reynolds and Regalado (2002)	Estimate how wetlands and other physical and economic variables affect rural land prices in four counties within southwest Florida	County variables	Location, parcel size, capital improvements, proportion of land in intensive uses, land area in wetlands describe more than 80% of variation in sales prices. Wetlands have negative effects (for agriculture), but positive effects were measured for specific type of wetlands, e.g. shrubland wetlands (amenities).	0.81
		Land in citrus * (+)		
		Road frontage * (+)		
		Size * (-)		
		Contribution of buildings * (+)		
		Distance to county seat * (-)		
		Wetland area * (-)		
		Specific wetland type systems: riverine (rivers, channels and drainage ditches) * (-), lacustrine (flooded lakes, reservoirs, intermittent lakes), Palustrine (dominated by trees, shrubs and emergents) * (-)		
Land in Palustrine shrubland/ forested/				

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
Spahr and Sunderman (1999)	Hedonic modelling used for valuation of real estate located close to a resort, in this case near Jackson, Wyoming, and then also for agricultural land located further away in rest of Wyoming state	Dollar value of real improvements Size Location * (+) Date of sale * (+) Scenic: view of Teton peak, effected by man-made effects: fair (no view of Tetons, less than average, affected by man-made effects)/ average view (poor Teton view/ average view)/ good (Teton view and other attributes) * (+)/ excellent view (full Teton view and view of trees/ water) * (+) Access: private road, gravel, paved Water: none/ streams * (+)/ Snake river footage Topography: flat/ rolling/slope/ steep Vegetation: hay/ graze/ trees * (+)/ mature vegetation * (+) Development: no potential/ limited potential/ prime/ already developed Dollar value of real improvements * (+) Carrying capacity Location based on eco-region * (-) Scenic: farms/ranches with fair /average * (+)/ good * (+)/ excellent * (+)scenic/ recreational value Grazing leases * (+) Date of sale * (+) Quality of land: productivity * (+)	Agricultural land near resort properties derives its value from recreational amenities such as scenery, recreation, streams, type of vegetation and general location. Agricultural land throughout the state derive value from a combination of agricultural and non-agricultural factors such as productivity of land (grazing) as well as from scenic (amenity) and recreational factors.	0.94
Schutjer and Hallberg (1968)	Impact of water recreational development on rural property prices in Pennsylvania	Month of transfer Size * (-) Road distance to nearest park entrance * (-) Ground water source * (+) Soil characteristics Slope Soil types Hard-surfaced road * (+) Soil conservation classification for producing wood products % of property covered in trees * (+) Expected corn yield * (+) Road distance to nearest small town * (-) Transferred after 1956 Feet of road frontage	Investment in water-based recreation influences value of rural property and structure of rural land market.	

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
AGRICULTURAL PROPERTIES LOCATED AT THE URBAN FRINGE (transitional land use)				
Shonkwiler and Reynolds (1986)	Analysis of land prices at the urban fringe - look at method to analyse land sales data where alternative uses are likely - Sarasota-Bradenton, Florida	Commercial or residential * (+)	Location important.	0.71
		Woodland		
		Distance to gulf		
		Land cultivated * (+)		
		Month of sale		
		Size * (+)		
		Distance to metropolitan area * (-)		
		Reciprocal of distance to airport		
		Distance to interstate highway * (-)		
Dunford et al. (1985)	Look at rural land prices at the urban fringe and impact of subjective buyer expectations in Clark County, Washington	Date of purchase	Several different categories of factors impact on rural land prices at the urban fringe, Site characteristics and location are important variables, as is expectations and the type of buyer, Rural land market is complex, More research needed on buyer expectations, external forces, buyer characteristics.	0.63
		Location * (-)		
		Buyer's perception of intensity for development (agr, mostly agr, mix, mostly residential, commercial) * (+)		
		Soil * (+)		
		Size * (-)		
		Road frontage * (+)		
		Distance in straight-line miles to nearest highway * (-)		
		Distance in straight line miles to nearest three towns * (-)		
		Buyer part of partnership * (+)		
		Reason why purchase land (neither agricultural or development)		
		Number of parcels bought by buyer in last 5 years		
		Inflation expectations * (+)		
		Expectation that neighbourhood will be intensely developed within 5 years* (+)		
Livanis et al. (2005)	Assess impact of urban sprawl on farmland prices through conversion of farmland to urban uses in continental USA	Accessibility index * (+)	Looked at three effects of urban sprawl: changes in non-farm opportunities, speculative effect of urban sprawl, conversion to high-value agriculture, Higher prices near cities lead to production of higher-valued crops (von Thunen).	0.75
		Soil and soil related variables * (+)		
		Organic matter		
		T-factor erosion tolerance		
		Calcium carbonate		
		Water table depths * (-)		
		Bulk density * (+)		
		Permeability * (+)		
		Salinity * (-)		
		Drainage		
		Soil depth * (+)		
		Three-inch rocks %		
		Irrigated acres * (+)		
		Palmer index: planting, harvesting, fallow season		
		Year dummy * (+)		
		Accessibility * (+)		
		Residential population growth * (+)		
Median house income * (+)				
Dummy for various areas (8) * (+)				

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
Drozd and Jonhson (2004)	Look at the dynamics of a rural land market that is undergoing conversion to acreages (urban influence) in Saunders County, Nebraska	Farmability characteristics (based on cropland value and land class production) * (+)	Buyers with special motivations often pay a premium for land, rural market is complex.	0.68
		Irrigation potential * (+)		
		Location * (-)		
		Size		
Platinga <i>et al.</i> (2002)	The impact of potential land development on agricultural land prices in 48 states of the USA	Net return to agriculture * (+)	Option values related to irreversible and uncertain land development are capitalised into farmland values.	0.67
		Current price of recent developed land *(-)		
		Cost of improvements		
		Highway density * (+)		
		Population density * (+)		
		Farmland density * (-)		
Shi <i>et al.</i> (1997)	Combination of urban-fringe and agricultural models on farmland prices in West Virginia	Expected net real returns from land * (+)	Farmland prices strongly affected by capital gains, relative location and distance from urban areas, real interest rates and expected net return from farmland.	0.95
		Real capital gains expected *(+)		
		Urban index (distance and population)*(+)		
		Real interest rate *(+)		
Chicoine (1981)	Research how urban and agricultural forces interact on urban fringe	Distance to Chicago * (-)	Neighbourhood effects, agricultural soil productivity, participant characteristics introduced with other common variables, Uses on neighbouring land important.	0.52
		Distance to nearest big town		
		Distance to nearest town		
		Distance to nearest freeway * (-)		
		Frontage road type		
		Neighbourhood (industrial, commercial) * (-)		
		Mining/ quarrying land use * (-)		
		Water body/ stream		
		Soil productivity		
		Septic tank soil limitations * (-)		
		Borders town * (+)		
		Zoning: agricultural/residential/ industrial/ commercial		
		Type of buyer * (-)		
		Time		
		Size * (-)		

Annexure 1: (continued)

Author	Description of study	Independent variables	Results/ conclusions	R ²
Paterson and Boyle (2002)	Include visibility of surrounding land use/ cover in a residential housing market through use of GIS into HPM - HOUSING MARKET in 2 areas in Connecticut	Variables for home style: raised ranch * (-), colonial, ranch, cape, split level, contemporary	Visibility is important environmental variable that affects sale prices, failure to include these variables lead to incorrect HPM specifications, if not visible, it is possible that land values are not so much affected by proximity to undesirable land uses, use GIS.	0.77
		Year home was constructed * (+)		
		% visible area within one km		
		% area developed and visible within one kilometre * (-)		
		% area in agriculture within one km		
		%forested area visible within one km * (-)		
		% area covered by water within one km* (-)		
		Number of rooms, fireplace, garages, bathrooms * (+)		
Size * (+)				
Hardie <i>et al.</i> (2001)	Joint influences of agricultural and nonfarm factors on real estate values in the Mid-Atlantic region, USA	Dummy for 1982, 1992	Farm and non-farm factors play a role in determination of prices.	
		Farm income * (+)		
		Farm production expenditures * (-)		
		Farm-owned machinery		
		County median house price * (+)		
		Investment		
		Distance * (+)		
		Population density		
Dummy for Delaware, New Jersey, Virginia, Pennsylvania, West Virginia				

* Attribute is statistically significant and has positive (+) / negative (-) relationship with dependent variable.

Note: in all studies the average price per acre was used as the dependent variable.

Annexure 2: Summary of studies exploring natural amenity variables

Author	Description of study	Variables	Results/ conclusions	R ²
Inman et al. (2002)	Look at preferences for use and sale of three types of agricultural land in Sublette county, Wyoming, using two models with economic, demographic, community values and attachment, environmental and land ownership and management variables.	Land use preferences (irrigated hay/ spring-fed meadow/ dry mountain meadow) for agricultural, recreational or wildlife, residential: Land management Number of acres owned Residence in county Reason for residence (rural lifestyle, sense of community, recreation) Environmental values - reasons for residence: scenery/ air or water quality/ climate Economic values: Reason for residence: job/ low taxes Demographics: age, income, source of income, qualification Preference to keep or sell/Agricultural use preference for/ Recreational use preference for/ Residential use of/ irrigated hay or spring-fed meadow or mountain meadow Expected future conditions: expect to be employed/ expect agriculture to be more important than recreation/ move if population increase/ expected quality of life	Productive (irrigated land) should remain in agriculture, Agricultural and recreation/ wildlife uses of remote landscapes preferred.	
McGranahan (1999)	Looks at which natural amenities draw "outsiders" to rural areas and drives rural population change, USA. Looks at migration between regions	Climate (humidity, temperatures during summer and winter, days of sunlight during winter) Water surface area Topography (Variation, e.g, mountains, foothills)	Different factors affect different regions differently.	Ranges from 0.29-0.41
Pope and Goodwin (1984)	Survey of Texas land brokers to determine socio-economic motivations for purchasing rural land in Texas	Good access roads, size, availability of water, scenery, view, elevation, topography, distance to towns and school, type of vegetation, improvements (electricity, water system)	Buyers of land influenced by non-farm factors, such as enjoyment of property.	
Nickerson (2003)	Amenities protected by farmland preservation programs	Open space Rural/ agrarian character Wildlife habitat Scenic beauty	These variables suggested.	

Annexure 2: (continued)

Author	Description of study	Variables	Results/ conclusions	R ²
Thompson (2003)	Recreation ranch appraisal - looks at how to value an agricultural property used for recreation by the matched pairs method	Land classification Market condition changes over time Location, access and seclusion Size Meadowland Home: Set with a view Vegetation, topography Water for sport and stock: Streams, ponds, lakes Views: Foothills, mountain ranges Recreation-use season: Climate, e.g. hunting in winter, ski in mountains	Provide an example of how to value recreation land with matched pairs, but this not always possible.	
Irwin, Nickerson, Libby (2003)	What are farmland amenities worth?	Open space Maintaining rural lifestyle Precluding development Scenic beauty Wildlife habitat Groundwater recharge Recreation Views	Suggest these variables as alternative values for farmland.	
Nickerson and Hellerstein (2003)	Protecting rural amenities through farmland preservation programs - looking at which amenities must be protected by use of willingness-to-pay, USA	Scenic views/ beauty Wildlife habitat Agrarian cultural heritage Open space Soil productivity Farm importance Development pressure Road access/ frontage Environmental significance Parcel size	Application of willingness-to-pay methodology to amenities.	
Kline and Wichelns (1998)	Measuring heterogeneous preferences for preserving farmland and open space with factor analysis, Rhode Island, USA	Open space: beaches, rocky shoreline, ponds, rivers, wetlands, woodlands Farmland: crop and pasture, turf farms, fruit and vegetable farms Access to land Endangered species habitat Groundwater resource Demographic: age, view of nature, environmental factor score, aesthetic factor score, agrarian factor score	These variables suggested, but not tested.	
Bourassa <i>et al.</i> (2003)	Impact of views on property values (house market) and dimensions of views in Auckland, New Zealand	Type of view (over water and land) Scope of view (wide, medium, narrow) Distance to coast Appearance of immediate surrounding improvements Quality of landscaping in neighbourhood Average quality of structures in neighbourhood	Water views important, but also quality of landscaping and improvements to the neighbourhood. Complex concept like view cannot be measured with one dummy variable (e.g. need scope of view, etc.).	0.63 - 0.95

Annexure 2: (continued)

Author	Description of study	Variables	Results/ conclusions	R ²
Arriazza <i>et al.</i> (2004)	Assessing the visual quality of agricultural landscapes through a survey of public preferences and then regression analysis. Respondents were shown pictures and had to rank these.	Water movement	Perceived visual quality increases with degree of wilderness in landscape, presence of well-preserved man-made elements, percentage plant cover, amount of water, presence of mountains, colour contrast.	0.52
		Amount of water * (+)		
		Vegetation cover *(+)		
		Type of vegetation		
		Horizon (slightly wavy, some mountains, mountains dominate scene) * (+)		
		Presence of man-made elements, positive * (+)		
		Presence of man-made elements, negative * (-)		
		Number of colours, contrast * (+)		
		Degree of wilderness * (+)		
Palang <i>et al.</i> (2004)	Landscape values and context in planning: and Estonian model	Economic: subsistence, market value, utilitarian	Look at value of agricultural landscape within broader landscape theme.	
		Amenity values: intrinsic ecological value, recreational and aesthetic values, scientific and educational values, orientation and identity value		
		Security value: demarcation, defence		
Goe and Green (2004)	Amenities and change in the well-being of non-metropolitan localities	Land based natural resources: mountains, National Parks	Measure presence of these natural resources in non-metropolitan commuter zones.	
		River-, lake-based natural resources		
		Warm weather, outdoor recreation		
		Cold weather, outdoor recreation		
		Historical, cultural amenities		
Deller <i>et al.</i> (2004)	Regional economic growth with a focus on amenities using principal component analysis	Climate variables (temperatures, precipitation, humidity)	Principal and components of amenities determined.	
		Urban facilities variables (amusement parks, swimming pools)		
		Land variables (Hunting, fishing lodges, mountains, cropland, camping grounds, state parks)		
		Water variables (marinas, canoe outfitters, diving instruction, guides service, fish camps, wetlands acres, river miles, water bodies)		
		Winter variables (ski)		
Dissart and Marcouiller (2004)	Impact of outdoor recreation facilities on remote rural income growth	Proportion of water	Remote areas have potential to generate substantial income from city dwellers who are attracted to the amenities provided by these areas.	
		Proportion mountain		
		Proportion forest		
		Proportion wetlands		
		Proportion wildlife		
		Water		
		Climate		
		Topography		
		Land		
		Wildlife		
Nature				

Annexure 2: (continued)

Author	Description of study	Variables	Results/ conclusions	R ²
Kleynhans and Opperman, 2005	Possible motivations for buying Stellenbosch properties - factor analysis	Appreciation of property value * Income from grapes/ wine Potential for new vineyards * Income from fruit Rental income from cottages Lifestyle * Tourism income Potential tourism income* Aesthetic beauty of property * Accessibility of property * Location of property relative to Cape Town * Privacy Existing vineyards on property Existing fruit orchards Potential/ planned orchards Potential/ planned wine cellar Existing wine cellar Existing homestead Historic value of existing homestead Size of homestead Value contribution of other buildings Number of guest houses Number of rentable houses Meso-climate * Slopes and aspect * Soils* General <i>terroir</i> *	Factor analysis provided hierarchy of the value contributing features of farm properties in Stellenbosch (in order of importance): terroir, location, aesthetic beauty, accessibility, potential of new vineyards, meso-climate, status of address.	
Robbins and Ahearn (1994)	The price of wilderness and scenic beauty: a methodology for the inventory and appraisal of wilderness and scenic land: Wilderness evaluation system, Scenic quality system combined to form Scenic beauty diversity score	Paved road Clear cut, logging operation Buildings Fences View from View to Vegetative screening Distance perimeter to core Rock form present, avalanche chute, cliff, rock outcrop, glacier Vegetative cover Percent slope Diversity (rock form, vegetation, water form) Physiography Rock form Vegetation Water form Wilderness and scenic quality system combined	Methodology proposed.	

Annexure 2: (continued)

Author	Description of study	Variables	Results/ conclusions	R²
Schultz (2007)	Compared characteristics of non-local hunting sales and country-wide local sales in two areas of North Dakota	Size (non-local smaller)	Non-local purchases of land for hunting purposes do not always lead to higher prices, does comparison between local and non-local (vs agricultural and non-agricultural).	
		Cropland (non-local contained less cropland)		
		Soil productivity (non-local on less productive land)		
		Streams (similar for both)		
		Prices (some areas higher, some lower, increase in land prices not only form non-local hunting purchases)		
Pope and Goodwin (1985)	Survey of land brokers to ask them what are motivation/ variables for purchasing farmland	Good access roads	Buyers motivated by enjoyment received from property and agricultural farming characteristics cannot explain price paid for agricultural land.	
		Size		
		Availability of surface water		
		Scenery and view		
		Agricultural productivity		
		Elevation and topography		
		Distance from town		
		Distance from schools, metro areas		
		Direct access to surface water		
		Type of vegetation		
		Abundance of wildlife		
		Improvements: water and electricity		
Tapsuwan (2007)	Look at effect of proximity of wetlands on urban house prices in Perth, Australia	Structural attributes: e.g. number of bedroom, bathroom, studies, carparks, dining rooms, game rooms, type of roofing material, age of house * (+)	Presence of wetland increase sale prices.	0.72
		Wetland attributes: Number of wetlands within 1.5km * (+), Size of wetland nearest to property		
		Neighbourhood attributes: Distance to beach, wetland * (-), Distance to school, to city, freeway * (+), Elevation * (+), income * (+)		

Annexure 3: Case study Protocol

PLAN FOR CONDUCTING MULTIPLE CASE STUDIES ON VALUATION OF AGRICULTURAL LAND FOR LIFESTYLE PURPOSES

1. OVERVIEW

1.1. Background

Rural land possesses many characteristics that bear value to its owners. Traditionally, such land was regarded mainly as a production factor, implying that its extrinsic value was the main determinant of its market value. However, the rural land market is undergoing complex supply and demand driven changes. Alternative uses of land where non-financial considerations of owning the land play a role, such as for enjoyment, recreation and lifestyle purposes, have become evident.

Farm valuations are done using the comparative market sales method approach, where the subject property is compared with farms with similar properties that were sold in the area. Applicable adjustments are made where differences in properties occur. The comparative sales method maintains that a property can have only one value (market value) at a specific point in time. Land valuers base their valuations on the highest and best use (HBU) they envisage for a property. The HBU of a property is defined as a use that generates the highest profit or satisfaction for the “typical” buyer at a specific moment in time. However, diverse buyer motivations and the increased number of uses of rural properties are complicating the decision of a single HBU.

Farm valuers are guided by the value attributes of a property in their decision of a HBU. The choice of the HBU of a property then implies the acceptance of a set of relevant value attributes. For instance, value attributes applicable for agricultural production include aspects such as soil fertility, availability of irrigation water, distance to the market and on-farm structures, such as presence of a wine cellar. In cases where buyers are acquiring farms mainly for lifestyle purposes, the conservation of fauna and flora, as well as the aesthetic satisfaction derived from agricultural landscapes and escape (albeit temporary) from the city-lifestyle supposedly play a significant role. These so-called lifestyle inspired buyers seem to be less dependent on the income generated from farming activities in the financing of such farm purchases. They are often willing and able to pay higher prices than the average land prices in the area.

The presence of both farming oriented buyers and lifestyle inspired buyers in the agricultural land market suggests different interpretations of the same farm, implying different value attributes and different priorities. It seems that there are no clear or obvious distinctions between farms bought for farming purposes and for lifestyle purposes. The use of inappropriate value attributes causes inaccurate valuations and higher risks for financing institutions which determine a loan based on the valuation of a farm.

For a full discussion on the phenomenon of lifestyle buyers and valuation theory, please refer to Chapter 2 (Overview of related literature) and Annexure 1 and Annexure 2, which provides results of selected Hedonic Pricing Model (HPM) studies.

1.2. Research problem and hypothesis

The central research question is: Can the effectiveness of the selection of an appropriate Highest and Best Use of a farm be increased and the valuation of lifestyle farms improved in an agricultural land market characterised by the presence of both farming and lifestyle motivations for buying land? In order to resolve this matter, two questions and working hypotheses have to be addressed.

Question 1: To what extent do valuers apply farming related value attributes and lifestyle related value attributes when they value farms bought for lifestyle purposes as confirmed by buyers?

Working hypotheses 1: Valuers apply mostly farming related value attributes when valuing farms bought primarily for lifestyle purposes.

Question 2: What are the typical value attributes of lifestyle inspired buyers of farms?

Working hypotheses 2: The applicable value attributes of the lifestyle motivated buyer diverge from the buyer that is primarily production oriented and these attributes can be determined.

1.3. Objectives of the case study

The objectives of this case study are to:

- Determine whether agricultural land valuations of farms bought primarily for lifestyle purposes are dominated by value attributes important for agricultural production as HBU.
- Determine the value attributes important to lifestyle buyers of farms

This is done through comparison of value attributes cited in valuation reports (valued with the “typical” buyer in mind) with value attributes of lifestyle buyers of such farms, as identified through personal interviews (actual buyers). The objective is to collect as many views as possible to demonstrate that people interpret farms differently and that valuers need to be aware of different perspectives in order to deal with uncertainty in valuations. The value attributes important to lifestyle buyers would also become clear through interviews.

The case study forms part of a bigger mixed method study, and make up the qualitative part of the research which is done first. The results from the case study - the value attributes identified by lifestyle buyers - are then included in a survey, which will be sent to actual buyers of agricultural land within an intensive and extensive area in the Western Cape Province, South Africa. The survey will be analysed statistically (quantitative phase). The case study forms the basis of the research and is exploratory in order to gain a better understanding of the phenomenon of lifestyle purchases of agricultural land (see section 3.3 for the full research design).

1.4. Motivation

This case study aims to fill the gap left by the transition to a multi-functional agricultural land market. In-depth knowledge of buyers and the value attributes they deem as valuable, would reduce uncertainty regarding the decision of a HBU. As a result more accurate valuations could be undertaken, which would improve decision making by the clients of such reports.

A case study approach was chosen as the relevant research methodology for the qualitative phase of this study, as it is adapted to explore complex issues, where a contemporary phenomenon is investigated within its real life context. The diverse considerations of buyers (e.g. buying agricultural land for lifestyle, farming, aesthetic and conservation purposes) and the characteristics of the subject property, as well as which characteristics are applicable to the different buyers are investigated. Case studies can accommodate diverse data collection approaches, which makes it a suitable approach for the investigation into the value attributes of lifestyle oriented buyers, who act according to a complex set of motivations, where many perspectives and multiple sources of evidence are consulted.

In order to research the phenomenon of the “lifestyle” buyer, it is necessary to look at the context within which farm valuations take place. These valuations are complex processes and many variables need to be taken into consideration in the determination of a Highest and Best Use (HBU) and the “typical” buyer. Previously valuations were performed within the context of the “typical” buyer being production oriented, focused on attributes pertaining to production (extrinsic characteristics), which generated many variables for consideration. The strength of the case study method lies in its ability to include many variables from multiple sources of evidence to shed light on decision making processes, where more variables than data points are created (Yin, 1984:19).

2. KEY FEATURES OF THIS CASE STUDY

This case study is exploratory – it investigates which value attributes of farms are important to lifestyle buyers, as well as explore the differences between “typical” buyers of farms as construed mentally by valuers, and actual buyers.

A holistic multiple case study design is followed. Several cases are included based on replication logic, i.e. cases that enhance understanding of the phenomenon of lifestyle purchases of agricultural land, with cases that predict similar results (literal replication) or contrasting results for expected reasons (theoretical replication). Most cases are done within the Western Cape (the case study is followed by a survey within two areas in the Western Cape), but the study is also expanded to include other geographical locations within South Africa to determine whether results are generalisable to the hypothesis (that the characteristics of farms bought for lifestyle purposes as valued by valuers differ from that of lifestyle buyers) across space, and if geographical differences account for deviations in the value attributes wanted in other areas (theoretical replication).

Unit of Analysis (UoA): thoughts of valuers and lifestyle buyers of agricultural properties

Object of Analysis (OoA): Farms bought for lifestyle purposes. Farms bought for lifestyle purposes are the anchor of each case study; farms are objective, but their value attributes are interpreted differently by parties involved in a transaction.

Instrument: semi-structured questionnaire applied by personal interviews

Variability: It is important that as much variability as possible is created within the case study. This is done by choosing farms which vary with respect to the type of agricultural enterprises done and valuers that differ in age, gender, experience and race. The order of the interviews is also varied.

3. RATIONALE FOR CHOICE OF CASES

Each case must provide an excellent example of the phenomenon of lifestyle purchases of farms. These cases must be exemplary in that they indicate a strong resemblance with the phenomenon of interest (“key ingredients” must be present, such as farms where the HBU is uncertain and “lifestyle” attributes are present, according to buyers’ perceptions, but where the valuation reports were done based on production value attributes). Cases must be complete and take alternative perspectives into account. For this reason all parties involved in a transaction of a farm bought for lifestyle purposes are interviewed. The goal is to develop ideas for further study (quantitative analysis of survey), and not to conclude the study: the idea is to build a general explanation that fits each individual case, even though cases differ in their details. Farms are examined from different perspectives, thus comparisons are made within and across cases. The criteria used in the selection of cases are provided in section 3.3.1.2.

All cases must contribute to the development of a rich theoretical framework to support better understanding and insight into the lifestyle buyer phenomenon. Conditions under which value attributes applicable to “lifestyle” buyers are likely (literal replication) and not likely to be found (theoretical replication) need to be specified to strengthen external validity. These need to be matched or contrasted with production oriented characteristics bearing value (such as soil fertility, farm structures) which have been identified and quantified in previous studies (Annexure 1 for summary of HPM studies). Other theories regarding HBU, intrinsic and extrinsic value, valuation theory and most probable use are also integrated into this framework (see Chapter 2).

4. FIELD PROCEDURES

This section outlines the key tasks undertaken in the data collection phase.

Training

- All information collected by researcher (interviews, valuation reports, direct observations)

- Course completed in Qualitative Research methods and analysis of qualitative research with the Atlas.ti computer package at University of Stellenbosch (2 weeks)

Data collection: steps

- Approach agricultural land valuers in the Western Cape as identified on the website of the South African Council of Property Valuers Professionals (www.sacpvp.co.za) telephonically to explain the research and ask for cases where they were involved in a farm valuation where they know lifestyle considerations were important. Then send them a letter of introduction (see Annexure 4) as reminder and to get detail of case (farm, contact detail of parties involved), as well as valuation reports
- Ask valuers for referral to other valuers who might be able to help within Western Cape and rest of South Africa (snowball sampling)
- In case of unsatisfactory responses: use list of the South African Council of Property Valuers Professionals to identify agricultural land valuers in rest of South Africa and use same procedure
- Aim for variability in valuers and types of farms
- Draw up unstructured interview with questions for interviewer
- Contact all parties involved in transaction as identified by valuer telephonically to introduce research and ask for convenient time for personal interview
- Send letter of introduction to all parties (see Annexure 5)
- Schedule interviews telephonically
- Check resources to be used in field: digital recorder and camera, notepad
- Try to gain access to property with buyer (preferably do interview with buyer at property, otherwise with any other respondent involved in transaction – observe farm and how respondent interpreted characteristics of farm)
- Do pilot case study with case that is “easy”, i.e. respondents accessible, valuer helpful and experienced, farm in close geographical proximity
- Complete Western Cape cases first, then schedule interviews with cases in KwaZulu-Natal, Gauteng, Limpopo, Mpumalanga to fit all into one trip
- Data collection activities: use 3-4 days per case, adjust if necessary (unanticipated events, such as no show of interviewee)
- Collection period: 3 months (later extended)
- Download interviews, valuation reports and transcribe into Microsoft Word documents
- Send to respondents to check for accuracy

- Keep valuation reports in safe place (confidential)
- Sources of information: interviewees, valuation reports, photos (direct observations)

Case study data base

The case study data base contains all the documentation for procedures followed in the research. It actually organises and documents all the data collected (see Annexure 7 and Annexure 8 for the case study data base). This includes literature used (e.g. publications on valuation theory, HBU, farm characteristics for agricultural production purposes, emergence of multi-functionality, natural amenities and characteristics associated with it), correspondence with respondents (e.g. letters), data sources for the case study (personal interviews, valuation reports, questionnaires)) and data analysis documents (e.g. memos, networks).

This leads to considerable amounts of evidence and data in various forms. For practical reasons only selected data are included within this data base. However, all evidence and data is available in either electronic or hard copy on request. Below is a list of all the evidence contained in the case study data base:

- Literature on farm characteristics for production and natural amenity purposes (Annexure 1 and Annexure 2)
- Letter of introduction to valuer regarding case study and identification of cases (Annexure 4)
- Letter to respondents participating in the case study (example of letter to buyer, but format the same for all respondents – see Annexure 5)
- Semi-structured interview for case study (Annexure 6)
- List containing detail of cases (case study data base and example of electronic data base, as well as detail of cases provided in Annexure 7 and Annexure 8 – full data base available on request)
- Example of Atlas.ti interface (Annexure 9)
- Codebook used in Atlas.ti – selected codes as examples (Annexure 10 - full codebook available on request)
- Table with results showing grounded and density codes (Annexure 11)
- Example of network created in Atlas.ti (Annexure 12 – full list of networks available on request)
- Table, matrixes used in qualitative analysis (Annexure 13)

- Questionnaire used in survey (Annexure 14)

5. CASE STUDY QUESTIONS

This section includes the significant questions that represent the investigation and serve as reminders to the researcher about the information that needs to be collected.

Table 1: Summary of case study questions and possible sources of evidence

Question	Notes	Probable source(s) of evidence
Which characteristics were most important/ appealed to whom?	This will probably differ between respondents, and that is exactly what is wanted, in order to get more information on different views/ perceptions of farms	Buyer Seller Valuer Estate agent Valuation report Direct observation (site visit)
Which characteristics are traditionally valued in this area?	Production oriented variables? The seller and valuer will probably have a more “traditional” view of the farm and will focus on characteristics that enhance agricultural production	Valuer Estate agent Seller Literature (HPM)
Do the characteristics as valued by respondents differ?	See if there are differences in attributes mentioned	Valuer Valuation report Buyer Seller Estate agent Direct observation
Which characteristics are important for lifestyle buyers of farms?	List of characteristics that differ from those already identified in literature (traditional production oriented characteristics)	Buyer Valuer? Seller (in case seller was also a lifestyle buyer) Estate agent (they should have good idea about lifestyle buyer, have to assist these buyers) Direct observations

6. ANALYSIS PLAN AND CASE STUDY REPORT

Individual cases

The individual case studies are analysed with the assistance of Computer Assisted Qualitative Data Analysis Software (Atlas.ti) (Annexure 9). Each interview and valuation report is coded (see Annexure 10 for examples of codebook) and the views of respondents within each case are compared.

Across cases

Cross-case analysis is done by combining all the cases and using the Word count, Density, Building of networks and Code family commands within Atlas.ti to manage the data for interpretation (Annexure 11). The initial research questions are reviewed, and critical evidence is then identified in the interviews, valuation reports and direct observations to support the hypotheses of this study (through similar and contradictory evidence). The theory relating to HBU, typical buyer and the hedonic pricing of farms are used as a framework/ basis in order to expand the theory relating to the valuation of farms when alternative considerations are present. The exploratory nature of the study puts the focus on the development of new hypotheses and theories (grounded theory) and the formulation of a new set of attributes that are important to lifestyle buyers of farms. These attributes are then structured into a questionnaire that is circulated to key valuers and a statistician for review (see Annexure 14). The questionnaire is to be used in a survey of land owners. Therefore, the “new” ideas developed in the case study are subjected to further analysis with the quantitative phase

7. CASE STUDY REPORT

The case study report is included in the Chapter 4 which contains the results of this study. The case study evidence (results) takes the format of a series of questions and answers, as depicted in the objectives, where all the cases are merged and cross-case analyses are provided (whether perspectives of valuers and buyers differ, and identification of characteristics associated with lifestyle buyers in survey). The data base creates an opportunity for other people to access the data.

Annexure 4: Letter of explanation to valuers participating in the case study



January 2007

Dear Sir/ madam,

Following up on our telephone conversation earlier regarding your participation in the study regarding the characteristics of farms that are important to lifestyle buyers, herewith an explanation:

The study involves the identification of characteristics of farms for buyers that acquire the farm mainly for lifestyle considerations, and not primarily for the productive potential of the farm. Many farms are sold to people who do not want to farm and buy a farm solely for the lifestyle it presents, and as a result the value of agricultural land in some cases are not determined by its productive potential, but rather by other factors/ characteristics of the farm. The identification of these characteristics will enable valuers to make more accurate valuations when dealing with such cases.

You are requested to choose a farm that you valued and where you know lifestyle considerations were involved (the more recent the better). A personal interview is requested, where you will be asked which characteristics in *your opinion* were important when you did the valuation. A copy of the valuation report is also requested (which will be treated as confidential). Because this study is exploratory in nature, it is important to include as much relevant information as possible and we want to identify as many applicable considerations as possible. For this reason we have to speak to other parties involved in the transaction in order to understand what they thought about the farm and its characteristics. Other applicable parties may, for instance, include the buyer, seller, buyer's wife, failed buyer and estate agent.

We will appreciate it if you could provide the following information as required in the table:

FARM NAME, NUMBER AND DISTRICT

Contact details of involved parties

Involvement with transaction	Name	Telephone number (cell or other)	Fax number	E-mail address
e.g. buyer				

Thank you for your effort – it is much appreciated!

Yours sincerely

Lozelle du Plessis (Natural resource economist, Western Cape Department of Agriculture)

Private Bag X1, Elsenburg 7607, Tel: (021) 808 5317, Fax: (021) 808 5120

Annexure 6: Questionnaire used in semi-structured interviews in case study

(questionnaire used as guideline by interviewer)

Background information:

1) Name of valuer/ buyer/ seller/ any other party and personal details (years of experience, demographic detail)

Farm:

- 2) Region/ area / Province?
- 3) Intensive/ extensive production area?
- 4) Farm details?

Buyer:

- 5) Where does buyer come from originally? What is buyer's occupation and ask to tell a bit more about themselves/family?
- 6) How many farms did the buyer visit and how did this influence his/her decision to buy this specific farm?
- 7) Why was this particular farm chosen? What was the deciding factor for buying this farm (e.g. visit farm with buyer and walk around on property)?
- 8) What about the rest of the family – which characteristics were important to them?

Valuer/ estate agent/ seller:

- 9) Which value attributes are traditionally applicable in this area?

Questions to all respondents:

10) Farm characteristics considered when valuing/ buying/ marketing/ selling the farm? *Give respondent opportunity to talk.* Use the following table as a guideline in order to direct the interview and ease the process of matching characteristics to applicable headings.

Characteristics considered in valuing/ buying/ marketing/ selling farm
Location and accessibility*
Natural resources
Infrastructure
Plantings

* If respondent does not talk about status, ask how the status of this farm compares with other farms in the area (let respondent evaluate this objectively)

Annexure 7: Case study data base

Table A7.1: Summary of cases included in the case study (qualitative phase)

Case	Area	Province	Type of farming area	Size (ha)	Use at time of sale	Capacity of interviewee (in order of interview)	HBU according to interviewee
1	Franschhoek	Western Cape	Intensive	47	Orchards, table grapes	Estate agent	Mixed (agriculture and lifestyle)
						Buyer	Lifestyle (holiday, but continuing farming activities)
						Seller	Mixed (agriculture and lifestyle)
						Valuation report	Agriculture (vineyards, orchards, other permanent crops)
2	Clanwilliam	Western Cape	Extensive	1258	Lucern	Buyer	Lifestyle (game, holiday)
						Valuation report	Agriculture (lucern, rooibos, spanspek)
						Seller	Agriculture
						Estate agent	Lifestyle
3	Paarl	Western Cape	Extensive	82	Horse stud	Buyer	Lifestyle (hotel/ residence/ horses)
						Estate agent	Lifestyle
						Seller	Agriculture (horses)
						Valuation report	Mixed: agriculture (horses, wine cellar) and residence(township)
4	Piketberg	Western Cape	Intensive	59	Vegetables	Valuation report	Mixed: agriculture (citrus, irrigation) and lifestyle (river front)
						Buyer	Investment, agriculture
						Failed buyer	Agriculture
						Seller	Lifestyle
5	Tulbagh	Western Cape	Extensive and intensive (irrigation)	51	Horse stud, lucern, plums	Valuation report	Mixed: irrigation land and lifestyle
						Seller	Agriculture
						Estate agent	Lifestyle
						Buyer	Lifestyle (weekend getaway)

Table A7.1: (continued)

Case	Area	Province	Type of farming area	Size (ha)	Use at time of sale	Capacity of interviewee (in order of interview)	HBU according to interviewee
6	George	Western Cape	Intensive	150	Dairy and sheep	Buyer	Mixed: agriculture (wildflowers) and investment
						Professional Valuer who knows farm	Mixed: agriculture (hops, dairy, wildflowers) and lifestyle (weekend getaway)
						Seller	Agriculture
						Estate agent	Agriculture
						Valuation report	Agriculture (dryland and irrigated land)
7	Heidelberg	Western Cape	Intensive (irrigation) and mountain land	47	Wildflowers	Estate agent	Lifestyle
						Seller	Lifestyle ("arty" getaway place, hydroponics)
						Buyer	Mixed (nursery, residence)
						Valuation report	Mixed: agriculture (hydroponics, wildflowers) and lifestyle (holiday)
8	Stilbaai	Western Cape	Extensive	40	Lifestyle	Seller	Lifestyle
						Buyer	Lifestyle (holiday)
						Buyer's wife	Lifestyle
						Failed buyer	Lifestyle
						Valuation report	Lifestyle (river frontage and golf park)
9	Franschhoek	Western Cape	Intensive	22	Nursery (neglected)	Buyer	Lifestyle (residence)
						Valuation report	Lifestyle (historic house)
						Seller	Agriculture (nursery, vineyards)
						Estate agent	Lifestyle
10	Touwsrivier	Western Cape	Extensive	4287	Sheep	Valuation report	Mixed: agriculture (sheep) and lifestyle (holiday)
						Buyer	Lifestyle (game farming, weekend getaway, chalets for hunting planned)
						Estate agent	Agriculture
						Seller	Agriculture

Table A7.1: (continued)

Case	Area	Province	Type of farming area	Size (ha)	Use at time of sale	Capacity of interviewee (in order of interview)	HBU according to interviewee
11	Ceres	Western Cape	Extensive	871	Lifestyle (game)	Valuation report	Lifestyle (game, holiday)
						Buyer	Lifestyle (game)
						Seller	Lifestyle
						Estate agent	Lifestyle
12	Nottingham road	KwaZulu-Natal	Extensive (Livestock), intensive (irrigation, trout)	464	Lifestyle (cattle and horses)	Buyer	Lifestyle (residence, fly-fishing)
						Valuation report	Mixed: agriculture (cattle, fly-fishing, dairy) and lifestyle (gentleman's estate)
						Seller	Mixed
						Estate agent	Lifestyle
13	Vryheid	KwaZulu-Natal	Extensive (grazing)	2600	Cattle	Valuation report	Agriculture (cattle, game)
						Seller	Agriculture
						Buyer	Mixed: agriculture (hunting for income), lifestyle (game)
14	Standerton	Mpumalanga	Extensive	469	Maize, cattle	Buyer	Mixed: agriculture (cattle, horses) and lifestyle (weekend getaway)
						Estate agent	Agriculture (grain, grazing)
						Seller	Agriculture (grain)
						Valuation report	Mixed: agriculture (grazing, grain) and lifestyle (equestrian estate)
15	Thabazimbi	Limpopo	Extensive (grazing)	1041	Game	Seller	Agriculture
						Valuation report	Agriculture: game, cattle
						Professional Valuer specialising in area	Mixed: game lodge and lifestyle (game)
						Buyer	Mixed: agriculture (meat processing) and lifestyle (weekend getaway)
16	Bela-Bela	Limpopo	Extensive	537	Lifestyle (game)	Valuation report	Mixed: agriculture (cattle, game) and lifestyle (development)
						Seller	Lifestyle
						Buyer	Investment

Annexure 8: Example of the electronic database (not complete)

The screenshot displays a Windows XP file explorer window titled "Respondents All". The address bar indicates the path: F:\Lozelle\Back ups\Data base qual\Respondents All. The main pane shows a list of files and folders with the following columns: Name, Size, Type, and Date Created.

Name	Size	Type	Date Created
Delta photos		File Folder	2008/09/30 03:57 PM
Drayton photos		File Folder	2008/09/30 03:57 PM
Kliphoogte Photos		File Folder	2008/09/30 03:57 PM
Kromdraai photos		File Folder	2008/09/30 03:57 PM
Melkboskraal photos		File Folder	2008/09/30 03:57 PM
Melkhfontein Photos		File Folder	2008/09/30 03:56 PM
NuweSion photos		File Folder	2008/09/30 03:56 PM
Photos		File Folder	2008/09/30 03:56 PM
Vrede photos		File Folder	2008/09/30 03:56 PM
Waboomskraal photos		File Folder	2008/09/30 03:56 PM
Zwartkop photos		File Folder	2008/09/30 03:56 PM
Delta B Solms	77 KB	Microsoft Word Doc...	2008/09/30 03:53 PM
Delta B Solms	44,293 KB	Wave Sound	2008/09/30 03:53 PM
Delta S Bergh	29 KB	Microsoft Word Doc...	2008/09/30 03:53 PM
Delta S Bergh	2,694 KB	Wave Sound	2008/09/30 03:54 PM
Delta V E Turner	39 KB	Microsoft Word Doc...	2008/09/30 03:53 PM
Delta V E Turner	10,615 KB	Wave Sound	2008/09/30 03:54 PM
Drayton B Nel	55 KB	Microsoft Word Doc...	2008/09/30 03:52 PM
Drayton B Nel	26,118 KB	Wave Sound	2008/09/30 03:52 PM
Drayton E March	37 KB	Microsoft Word Doc...	2008/09/30 03:52 PM
Drayton E March	8,322 KB	Wave Sound	2008/09/30 03:52 PM
Drayton S Howisons	51 KB	Microsoft Word Doc...	2008/09/30 03:52 PM
Drayton S Howisons	26,887 KB	Wave Sound	2008/09/30 03:52 PM
Drayton V dKlerk	53 KB	Microsoft Word Doc...	2008/09/30 03:52 PM
Drayton V dKlerk	19,567 KB	Wave Sound	2008/09/30 03:52 PM
Haakdfontein B Coetzer	34 KB	Microsoft Word Doc...	2008/09/30 03:27 PM
Haakdfontein B Coetzer	3,563 KB	Wave Sound	2008/09/30 03:26 PM
Haakdfontein S Streicher	60 KB	Microsoft Word Doc...	2008/09/30 03:27 PM
Haakdfontein S Streicher	8,460 KB	Wave Sound	2008/09/30 03:26 PM
Haakdfontein V Enslin	64 KB	Microsoft Word Doc...	2008/09/30 03:27 PM
Haakdfontein V Enslin	24,248 KB	Wave Sound	2008/09/30 03:26 PM
Keerom B de Beer	53 KB	Microsoft Word Doc...	2008/09/30 03:30 PM
Keerom B de Beer	8,208 KB	Wave Sound	2008/09/30 03:30 PM

The left pane shows "File and Folder Tasks" (Make a new folder, Publish this folder to the Web, Share this folder) and "Other Places" (Data base qual, My Documents, My Computer, My Network Places). The "Details" pane shows "Respondents All" as a File Folder, last modified on 30 September 2008, 03:57 PM. The taskbar shows the start button, several open applications (Database, Respondents All, CS Protocol - Micro..., Protocol - Microsoft..., Document11 - Micro...), and the system tray with the date and time (02:38 PM, Wednesday, 2008/10/01).

Annexure 9: Example of Atlas.ti interface

The screenshot displays the Atlas.ti software interface. The main window is titled "Analysis - ATLAS.ti" and contains a text document on the left and a codebook structure on the right.

Text Document Content:

004 JN: OK, what, how I chose that particular farm, is that there is a road, a
 005 district road that runs off the tar road, that tar road is called Lotheni road,
 and then there is this little district road that goes all the way, about 7 to 8
 kilo's in to the mountains. And the road ends into the farm. So it is basically
 an end to a road, which is basically a cul-de-sac, which I put a huge
 premium on. There is no possibility of a road dissecting your land, which I
 did not like whatsoever. So it goes, it dissects another farm which has a
 servitude entrance from their farm onto our farm.

006
 007 And there is also the little Mooi, which is a good trout fishing river. And
 there is 6 kilometres of little Mooi running through the farm. And in the
 majority of the river, the farm forms both banks of the river, which is very
 unusual, normally the middle of the river delineates the boundaries. So, so in
 this instance, in a large portion of the river you have both banks, ja. It is
 obviously in the Lotheni road, which is outside of Nottingham road, which is
 a bit too commercially busy at the moment. So it's there.

008
 009 But the majority of the value that I attach to the farm is the fact of the river,
 it's got this huge dam, an 8 hectare dam with trophy trout and all that. It's
 got a cottage and a nice house, and those we all adding to the land, the
 buildings there. But it was the aesthetic beauty of the land. The fact that it is
 nestled on a valley, with like virgin [inaudible] on the rightside, and it is just
 isolated completely. So it is like, in a valley, and there is farms on the other
 side of it, so no one can come and steal your cows and all that. And just the
 land, the layout of the land, the topography and the land, I have never seen
 a land of such beauty. I mean, just the layout, it forms almost like a
 horseshoe valley base, and the views that you have and the complete
 isolation of it, is what made me pay a premium for it. If that farm was just a
 kilometer to the right or to the east I would have dropped the value by

Codebook Structure:

- L_private
 - L_Private B
- Position_Access
 - Position_Access B
- Position_distance town
 - Position_distance town B
- Position_location B

- L_Water availability
 - L_Water availability B
- L_Water river/ stream
 - L_Water river/stream B
- L_Water riverfront
 - L_Water riverfront B

- L_Water use trout B
- L_Water river/stream B
- L_Water riverfront B

- NB B
- V_Price B
- L_Water river/ stream
- L_Water river/stream B
- L_A
- Infra_houses
 - Infra_houses B
- L_Beauty house
 - L_Beauty house B
- L_security
 - L_Security B
- L_Beauty
 - L_Beauty B
- L_P&Q
 - L_P&Q B
- V_Price B
- L_Infra_functional B
- L_Water dam
 - L_Water dam B
- L_Water use trout B
- L_P&Q
- Position_location B
- L_private
 - L_Private B
- L_View
 - L_View B

The interface also shows a taskbar at the bottom with the Windows Start button, several open applications (PHD - road map - Mi..., Microsoft Excel - Att..., PhD backup 3 Jan 08, Atlasti), and the system tray displaying the date and time (Tuesday, 2008/07/29, 02:04 PM).

Annexure 10: Codebook used in Atlas.ti

Table A10.1: Selected codes as an example of the codebook drawn up for qualitative analysis in Atlas.ti

Theme	Category	Code	Definition	Examples of quotations where code was used
	Attribute	NB	Most dominant aspect of farm for respondent, attribute that is mentioned first when asked about farm	<p>P 6: (Valuer).doc - 6:49 (5:15) Codes:[NB]: Nee, die mooi rivier. Die rivier. Want die plaas het so 2 kilometer rivierfront.</p> <p>P10: (Buyer).doc - 10:5 (9:9) Codes: [NB]: But the majority of the value that I attach to the farm is the fact of the river, it's got this huge dam, an 8 hectare dam with trophy trout and all that. It's got a cottage and a nice house, and those we all adding to the land, the buildings there. But it was the aesthetic beauty of the land. The fact that it is nestled on a valley, with like virgin [inaudible] on the right side, and it is just isolated completely. And just the land, the layout of the land, the topography and the land, I have never seen a land of such beauty.</p> <p>P 7: (Buyer).doc - 7:19 (20:20) Codes:[NB]: I walked across that courtyard over there, where I just met you, I walked across that courtyard, there was a wind blowing through the trees and I thought I am buying this house. Definitely. This is where I am going to live.</p> <p>P 7: (Buyer).doc - 7:13 (16:16) Codes: [NB]: I think they said how many hectares, but my thinking was not farming, it was a beautiful place to live.</p>
Lifestyle	Attributes	L_P&Q	Attraction of tranquillity for lifestyle reasons	<p>P29: (Buyer).doc - 29:51 (78:78) Codes:[L_P&Q]: I like the peace and I don't want to upset the ecology. I love the peace and tranquillity.</p> <p>P42: (Buyer).doc - 42:37 (43:43) Codes:[L_P&Q]: Spasie dit is stil, stil, stil. Doodstil.</p> <p>P10: (Buyer).doc - 10:111 (132:132) Codes:[L_P&Q]: But just the peace, and beauty.</p>
Lifestyle	Attributes	L_Beauty	Appeal of property, attraction, splendour	<p>P 9: (Estate agent).doc - 9:52 (81:81) Codes:[L_Beauty]: It's a typical sort of pretty farm.</p> <p>P45: (Estate agent).doc - 45:7 (7:7) Codes: [L_Beauty]: So for a city person, I think the combination of the beauty of the river, the mountains.</p> <p>P10: (Buyer).doc - 10:15 (9:9) Codes:[L_Beauty]: I have never seen a land of such beauty.</p>
Agriculture	Attributes	A_Potential	Possibilities and prospects in terms of agriculture for the property	<p>P12: (Valuer).doc - 12:30 (53:53) Codes:[A_Potential]: typically if you look at a farm like this, it is largely veld grazing, which is normally not very valuable land, and it is only in recent years that we have seen that increase from as low as R700 per hectare or the midlands average sort of fifteen hundred it is now 3000 plus.</p> <p>P37: (Estate agent).doc - 37:14 (10:10) Codes: [A_Potential]: A lot of people want to escape to a mountain. That's not viable farmland anyway.</p>

Annexure 11: Example of Atlas.ti interface showing grounded and density results

Code Manager [HU: Analysis]

Codes Edit Miscellaneous Output View

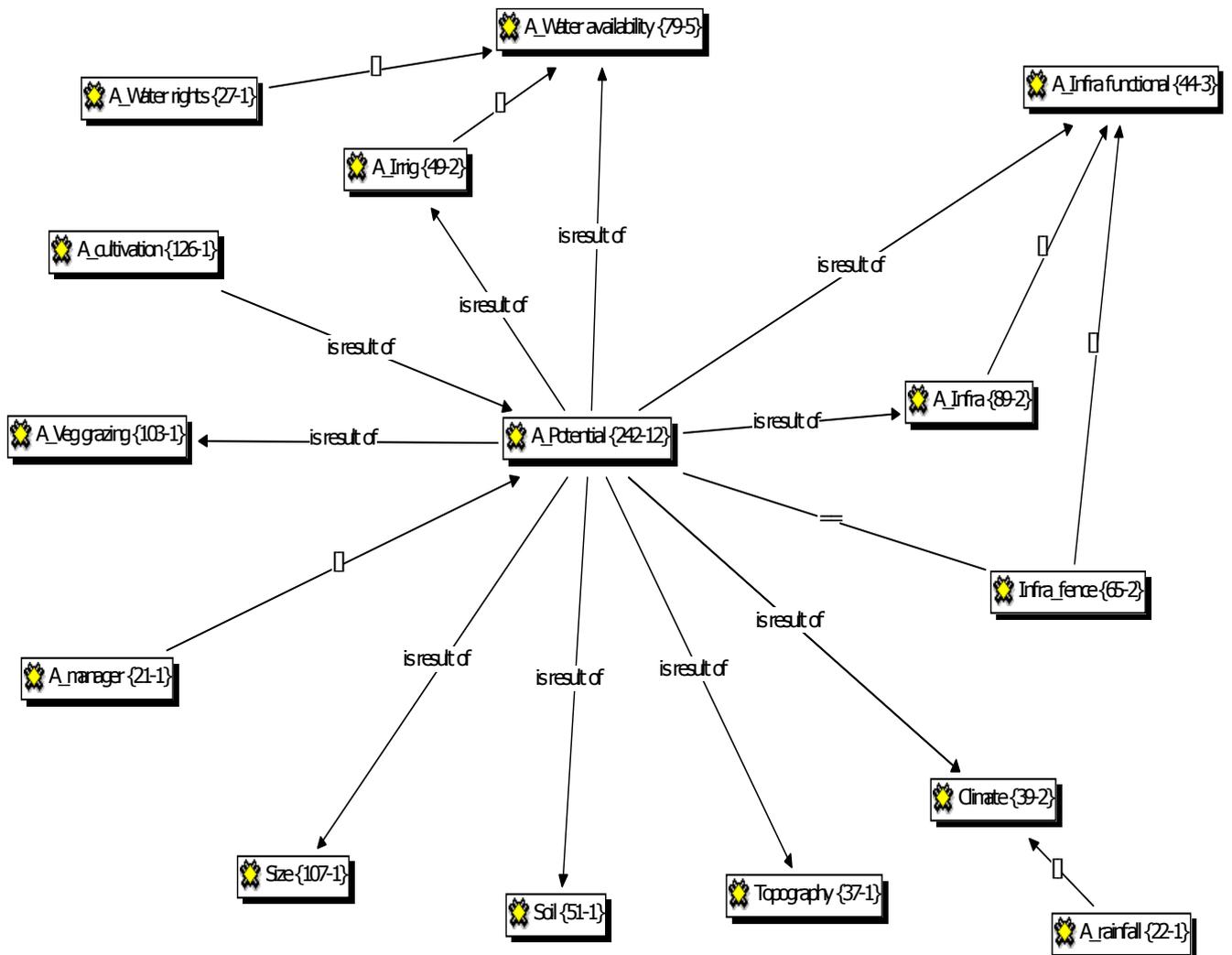
Name	G..	Density	Author	Created	Modified
A_Potential	213	16	Super	07/09/20...	07/10/25...
Position_distance town	181	10	Super	07/09/15...	07/10/31...
L_Water availability	166	13	Super	07/09/20...	07/10/25...
Position_Access	163	9	Super	07/09/15...	07/10/31...
L_Beauty	163	22	Super	07/09/15...	07/10/31...
L_Mountain	146	11	Super	07/09/22...	07/10/31...
L_Water river/ stream	134	14	Super	07/09/22...	07/10/31...
A_cultivation	122	7	Super	07/09/18...	07/10/25...
Infra_buildings	122	13	Super	07/09/17...	07/10/31...
Infra_houses	117	11	Super	07/09/15...	07/10/31...
A_Potential V	108	1	Super	07/09/18...	07/10/23...
V_Price V	108	0	Super	07/09/20...	07/10/23...
L_game	105	12	Super	07/09/21...	07/10/31...
L_Water riverfront	103	10	Super	07/09/18...	07/10/25...
A_Veg grazing	100	9	Super	07/09/19...	07/10/31...
Size	94	8	Super	07/09/18...	07/10/31...
L_Income	92	11	Super	07/09/20...	07/10/31...
NB B	91	0	Super	07/09/20...	07/10/23...
L_Beauty nature	87	16	Super	07/09/15...	07/10/25...
L_Nat veg	86	10	Super	07/09/25...	07/10/25...
Infra_residential	81	7	Super	07/09/17...	07/10/31...
Position_distance town V	80	1	Super	07/09/25...	07/10/25...
Position_location V	79	1	Super	07/09/25...	07/10/31...
Infra functional	78	9	Super	07/09/20...	07/10/31...
Infra_condition -	76	1	Super	07/09/15...	07/10/31...
L_A	75	24	Super	07/09/20...	07/10/31...
L_security	74	6	Super	07/09/17...	07/10/31...
HBU V	74	0	Super	07/09/18...	07/10/23...
A_Water availability	73	7	Super	07/09/15...	07/10/25...
Position_Access V	72	1	Super	07/09/19...	07/10/25...
V_Price B	72	0	Super	07/09/18...	07/10/23...
L_Potential	71	8	Super	07/09/20...	07/10/25...
L_View	71	9	Super	07/09/18...	07/10/25...
I_Expenses Infra	69	8	Super	07/09/15...	07/10/31...

556 Codes No item selected All Grounded - Number of reference

start EN 02:03 PM Wednesday 2008/07/30

PHD - road... Document... Document... Microsoft E... AZEF Analysis - ... Inbox - Mic...

Annexure 12: Example of Atlas.ti interface showing the network created for agricultural potential



Annexure 13: Example of matrix constructed using grounded and density results from Atlas.ti during qualitative analysis

Codes: Grounded	Codes: Density
V_Price opinion	Attributes lifestyle
A_Potential	Attributes Agric
NB	L_Potential
Position_distance town	L_Beauty
Infra_houses	A_Potential
L_Water availability	L_nature
L_Beauty	L_Mountain
Position_Access	Infra_buildings
HBU	L_Water river/ stream
Position_location	A_Water availability
L_Mountain	L_Nat veg
Infra_condition	Activities
L_Water river/ stream	L_Water availability
Infra_buildings	L_private
L A_activity	L_Income
A_cultivation	Water availability
L_Income	L_game
L_game	L_Water riverfront
L_Water riverfront	Disadvantage
Size	L A_activity
L_Expenses	L_Priceless replace
A_Veg grazing	L_Water borehole
L_Beauty nature	Climate
A_Infra	Topography
L_Nat veg	L_Beauty historic house
L_Family/ friends	Infra_historic buildings
L_View	Infra_fence
L_Potential	L_Beauty forest/trees
A_Water availability	A_Infra
AltHBU_develop	L_Water dam
Infra functional	L_water use
L_security	L_Beauty nature
L_A	L_P&Q
Disadvantage	A_Infra functional
L_Water dam	L_relax
Infra_fence	L_Expenses
L_status	AltHBU_develop
L_Beauty forest/trees	L_getaway
L_P&Q	Size
Soil	Position_distance town

Note: Codes are colour-coded, therefore a code appearing under both columns bears the same colour. This enabled the researcher to determine if the grounded codes (indicate of the number of times the phrase (code) appeared within interviews) were related to the densities (networks, relationships between codes). Overall this gives an indication of the importance of specific characteristics for different types of respondents (e.g. valuer and buyer).

Annexure 14: Questionnaire used in quantitative survey within the intensive and extensive areas



UNIVERSITEIT-STELLENBOSCH-UNIVERSITY
jou kennisvenoot • your knowledge partner



January 2008

Dear Landowner

SURVEY REGARDING CHARACTERISTICS OF AGRICULTURAL LAND THAT WERE IMPORTANT IN YOUR DECISION TO BUY A FARM

You are requested to participate in this survey to landowners of agricultural land in order to determine which characteristics of farms are important to the buyers thereof. This survey is part of a joint research initiative funded by the Western Cape Department of Agriculture and the University of Stellenbosch.

You are part of a small, selected group of buyers included in this survey. For this reason your participation is important! **It should not take more than twenty minutes of your time.**

The purpose of the questionnaire is to identify the diverse considerations of buyers when they purchase agricultural land, in order to better understand which characteristics of agricultural land bear value to these buyers.

The questionnaire consists of two sections. In the first section you are asked which characteristics of agricultural land appeals to you in general, and then to what extent you obtained what you wanted when you bought this farm in particular. Most questions are presented on a ten-point scale. The second section contains general and demographic questions.

Your participation is important and highly valued, but you are under no obligation to complete the questionnaire. The information will be treated confidentially and will not be made available on an individual basis. Summarised results would be presented to the Department and valuers of agricultural land, as well as published in research journals. Feel free to contact me for a copy of the results, should you be interested!

Please contact me in case you have any queries at (021) 808 5317, or lozelledp@elsenburg.com. You can send the completed questionnaire to the e-mail address provided above, or fax it through to 0866 502 032. Alternatively you can mail the completed questionnaire in the addressed envelope provided (postage paid) to: L Reed, P.O. Box 147, Elsenburg, 7607.

Thank you very much for your time and willingness to participate.

Regards

Lozelle Reed

Tel: 021 808 5317

Cell: 082 801 4029

Fax: 0866 502 032

e-mail: lozelledp@elsenburg.com

**SURVEY REGARDING CHARACTERISTICS OF AGRICULTURAL LAND THAT
WERE IMPORTANT IN YOUR DECISION TO BUY A FARM**

RESPONDENT AND FARM INFORMATION

Farm and division number	
Farm name	
Registration Division	
District	
Municipality	
Name of buyer	
Name of representative (in case of Trust, company)	
Preferred means of contact:	

You form part of a small group of buyers that are included in this survey. Therefore your participation is important!

SECTION A

This section consists of subsections, divided by headings. All questions relate to the characteristics of agricultural land that appealed to you in your search for a suitable farm. The questions are made up of an (a) and (b) part:

- (a) requires you to provide a score on a scale of 1 to 10, where 1 represents “Not important at all” and 10 represents “Very important” in order to indicate how important the given characteristic was in your choice of an agricultural property *in general* (**i.e. what were you wanting while you were looking at farms?**).
- (b) requires you to provide a score on a scale of 1 to 10, where 1 represents “Not at all” and 10 represents “Completely”, in order to indicate to what extent the *particular* farm that you bought satisfied your need for that specific characteristic (**i.e. what did you get when you bought this farm?**).

Please select the most appropriate number by drawing a cross over the score of your choice.

IMPORTANCE OF POSITION AND ACCESSIBILITY

- 1(a) Importance of distance from the property to the **nearest big city** to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

- 1(b) To what extent did this *particular* property that you bought satisfy the possible need for proximity to the **nearest big city**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

- 2(a) Importance of distance from the property to the **nearest town** to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

- 2(b) To what extent did this *particular* property that you bought satisfy the possible need for proximity to the **nearest town**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

- 3(a) Importance of distance from the property to the **nearest airport** to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

- 3(b) To what extent did this *particular* property that you bought satisfy the possible need for proximity to the **nearest airport**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

8(b) To what extent did this *particular* property that you bought satisfy the possible need for a **private and secluded** location, with little or no thoroughfare?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

IMPORTANCE OF AGRICULTURAL PRODUCTION POTENTIAL

9(a) Importance of the **agricultural potential** of the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

9(b) To what extent did this *particular* property that you bought satisfy the possible need for **agricultural potential**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

10(a) Importance of the **soil quality** of the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

10(b) To what extent did this *particular* property that you bought satisfy the possible need for good **soil quality**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

11(a) Importance of the **meso climate*** of the property to you *in general*.

* Meso climate refers to the climate on the property itself, which is a narrower description than the climate of the area. It includes variables such as temperature, rainfall and wind.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

11(b) To what extent did this *particular* property that you bought satisfy the possible need for a **suitable meso climate**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

12(a) Importance of an **appropriate size** of the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

12(b) To what extent did the **size** of this particular property that you bought satisfy your needs?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

25(b) To what extent did the *particular* property that you bought satisfy the possible need for **other residential units** in a **suitable condition**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

26(a) Importance of the **accommodation capacity** of **other residential units** on the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

26(b) To what extent did the **other residential units** on the *particular* property that you bought satisfy the possible need for **accommodation capacity**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

27(a) Importance of the **general condition** of **labour housing** on the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

27(b) To what extent did the *particular* property that you bought satisfy the possible need for **labour housing** in a **suitable condition**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

28(a) Importance of **accommodation capacity** of **labour housing** to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

28(b) To what extent did the **labour housing** of the *particular* property that you bought satisfy the possible need for **accommodation capacity**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

29(a) Importance of the **income generation capacity** of **other residential units** on the property to you in general (e.g. for tourists).

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

29(b) To what extent did the **other residential units** of the *particular* property that you bought satisfy the possible need for **income generation capacity**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

30(a) Importance of **legal permanent living rights** for farm labourers on the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

30(b) To what extent did the *particular* property that you bought satisfy the need for **legal permanent living rights** for farm labourers?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

IMPORTANCE OF NON-RESIDENTIAL INFRASTRUCTURE

31. The table below contains a list of non-residential infrastructure. Please tick which infrastructure was important to you in your decision to buy an agricultural property.

Wine cellar	
Shed	
Milking parlour	
Horse stables	
Packing shed	
Cold store	
Fenced camps	
Other infrastructure (specify)	

32(a) Importance of the **general condition** of the non-residential infrastructure on the property (as indicated in Question 31) to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

32(b) To what extent did the *particular* property that you bought satisfy the possible need for non-residential infrastructure (as indicated in Question 31) in a **suitable condition**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

33(a) Importance of the **capacity** of the non-residential infrastructure (as indicated in Question 31) on the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

33(b) To what extent did the non-residential infrastructure (as indicated in Question 31) of the *particular* property that you bought satisfy the possible need for **sufficient capacity**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

38(b) To what extent did this *particular* property that you bought satisfy the possible need for **game proof fencing** in a suitable condition?

1	2	3	4	5	6	7	8	9	10
← Not at all					Completely →				

IMPORTANCE OF OTHER CHARACTERISTICS

39(a) The table below contains descriptions associated with natural scenery. What do you associate with natural scenery? Please tick your answer(s) in the space(s) below. **You may tick more than one description.** If a particular description does not appear on the list, please specify it in the open space.

Pristine environment with vegetation typical of the area	
Big trees, forests and bush	
Valleys, gorges and ravines	
Mountains	
Rock formations and rock faces	
Streams and waterfalls	
Rivers, river frontage and riparian areas	
Wildlife	
Birdlife	
No sign of civilisation (such as roads and buildings)	
Openness and space	
Clean fresh air	
Peace and quiet (tranquility)	
Other (specify)	

39(b) Importance of the presence of **natural scenery** on the property from an **aesthetic** point of view *in general*. In other words, when you are outside the property looking onto it, how important is the natural scenery?

1	2	3	4	5	6	7	8	9	10
← Not important at all					Very important →				

39(c) To what extent did the particular property that you bought satisfy the possible need for the presence of **natural scenery** from an **aesthetic** point of view?

1	2	3	4	5	6	7	8	9	10
← Not at all					Completely →				

40(a) Importance of the presence of a **river or stream** that flows through the property, with **river frontage**, from an aesthetic point of view to you *in general*.

1	2	3	4	5	6	7	8	9	10
← Not important at all					Very important →				

40(b) To what extent did the *particular* property that you bought satisfy the possible need for the presence of a **river or stream** with **river frontage**, from an **aesthetic point** of view.

1	2	3	4	5	6	7	8	9	10
← Not at all					Completely →				

41(a) Importance of the presence of a **mountain** or mountainous area on the property, from an **aesthetic** point of view to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

41(b) To what extent did this *particular* property satisfy the possible need for the presence of a **mountain** from an **aesthetic** point of view?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

42(a) The table below provides descriptions associated with “beautiful” views. What do you associate with a “beautiful” view? Please tick your answer(s) in the space(s) below. **You may tick more than one description.** If there is a description that you associate with a “beautiful” view that is not on the list, please specify it in the open space.

View of vineyards	
View of orchards	
View of cultivated lands	
View of natural veld	
View of indigenous vegetation (such as fynbos, karoo bush)	
View of trees	
View of mountains and mountain ranges	
View of valleys, gorges and ravines	
View of water such as a river, stream or dam	
View of river frontage	
View of rural surroundings and farms scenery (e.g. horses grazing)	
360 degrees uninterrupted views	
View of the sea	
View of natural scenery	
No ESKOM power lines in sight	
No sign of civilisation (e.g. roads, buildings)	
View that stretches to the horizon, such as never-ending karoo plains	
View of historical buildings	
View of a well-kept garden	
Other (specify)	

42(b) Importance of a **view** from the property from an **aesthetic** point to you *in general*. In other words, when you look from within the property to the outside.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

42(c) To what extent did this *particular* property that you bought satisfy the possible need for a **view** from an **aesthetic** point?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

47(b) To what extent did the *particular* property that you bought satisfy the possible need for suitability for **outdoor recreation activities**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

48(a) Importance of the **availability of water** for **recreation activities** (e.g. canoeing) on the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

48(b) To what extent did the *particular* property that you bought satisfy the possible need for **availability of water** for **recreation activities**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

49(a) Importance of the availability of **water** for the generation of income from **activities other** than irrigation agriculture (e.g. tourism, fishing) on the property to you *in general*.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

49(b) To what extent did the *particular* property that you bought satisfy the possible need for **water** for the generation of income from **activities other** than irrigation agriculture?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

50(a) Importance of the **status of the address** of the property to you *in general* (in terms of the property being situated in a socially desirable area that is well-established, with good neighbours).

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not important at all Very important →

50(b) To what extent did the *particular* property that you bought satisfy the possible need for a **status of the address**?

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

← Not at all Completely →

51. What was the most important characteristic of the property that convinced you to purchase it?
.....
.....
.....
.....

SECTION B

The questions below contain demographic and general information, in order to contextualise your answers. **Please tick the most appropriate answer.**

52. What was the predominant reason for buying this agricultural property?

Farming reasons	
Lifestyle reasons	

53. You might have found the previous question difficult to answer. On the scale below 1 depicts “exclusively for farming purposes” and 10 depicts “exclusively for lifestyle purposes”. What was your purpose for buying this farm?

1	2	3	4	5	6	7	8	9	10
← Farming purposes					Lifestyle purposes →				

54. In the case of there being **other reasons** for buying this property different to those mentioned above, please tick it in the space left below.

Speculation purposes	
Expansion of existing farming unit by buying this as neighbouring property	
Other (specify)	

55. Do you live permanently on this particular farm that you purchased?

Yes	
No	

56. Is your primary source of income (choose **one** option):

The farm concerned that you purchased	
Another farm(s)	
Non-farming income	

57. Gender?

Male	
Female	

58. What is your language of preference?

Afrikaans	
English	
Other (specify)	

59. What is your marital status?

Married	
Single	

60. What is your highest qualification?

Matric	
Diploma	
B-degree	
Post graduate degree	

61. What is your work situation?

Work full-time	
Retired	
Work part-time	

62. What is your gross income per annum?

Under R200 000	
R200 001 – R400 000	
R400 001 – R 600 000	
More than R600 000	

63. Did you grow up on a farm?

Yes	
No	

64. What is your nationality? If you are a non-RSA citizen, please specify from which country you hold citizenship.

RSA citizen	
Non-RSA citizen (specify)	

65. What is your occupation?

.....

66. What was your age on 1 January 2008?

.....

Annexure 15: Mean and median scores indicating importance of variables according to lifestyle and production oriented buyers in intensive and extensive area

Variable	Statistic	INTENSIVE AREA			EXTENSIVE AREA		
		Lifestyle buyers	Production-motivated buyers	All groups	Lifestyle buyers	Production-motivated buyers	All groups
Location: proximity to nearest city	Means	7.36	6.67	7.12	6.43	4.82	5.66
	Median	8.00	8.00	8.00	7.50	4.50	5.00
Location: proximity to nearest town	Means	8.59	7.14	8.08	5.67	6.04	5.84
	Median	9.00	7.00	8.50	6.00	6.00	6.00
Location: proximity to nearest airport	Means	6.28	3.95	5.49	2.33	1.89	2.12
	Median	7.00	3.00	7.00	1.00	1.00	1.00
Location: proximity to nearest major road/ freeway	Means	7.23	6.67	7.03	4.87	5.21	5.03
	Median	8.00	6.00	8.00	5.00	5.00	5.00
Location: travelling time	Means	7.79	7.24	7.60	7.47	7.25	7.36
	Median	8.00	8.00	8.00	8.00	8.00	8.00
Access: for tourists	Means	5.68	4.52	5.27	4.53	4.41	4.47
	Median	7.00	3.00	6.00	5.00	3.00	4.00
Position: setting (in valley, against mountain)	Means	7.85	5.38	6.98	6.83	5.64	6.26
	Median	8.00	6.00	8.00	7.00	6.50	7.00
Position: private	Means	7.82	7.57	7.73	8.97	8.18	8.59
	Median	8.00	8.00	8.00	10.00	9.00	9.00
Production potential: general	Means	5.87	7.95	6.60	5.73	9.04	7.33
	Median	6.00	9.00	7.00	6.00	10.00	8.00
Production potential: soil quality	Means	6.38	8.24	7.03	6.13	8.14	7.10
	Median	7.00	9.00	8.00	7.00	9.00	8.00
Production potential: meso climate	Means	6.82	7.38	7.02	7.47	7.04	7.26
	Median	8.00	8.00	8.00	7.50	8.00	8.00
Production potential: size of property	Means	7.36	7.43	7.38	8.23	8.29	8.26
	Median	8.00	8.00	8.00	8.00	9.00	8.50
Production potential: condition of existing cultivated areas	Means	5.21	5.71	5.38	3.80	6.11	4.91
	Median	5.00	5.00	5.00	3.00	6.50	5.00
Production potential: expansion possibilities of existing cultivated areas	Means	5.56	6.24	5.80	4.73	6.14	5.41
	Median	6.00	8.00	6.00	5.50	7.00	6.00
Production potential: grazing capacity	Means	3.26	3.00	3.17	6.93	7.68	7.29
	Median	2.00	1.00	1.50	8.00	9.00	8.00
Production potential: game production	Means	1.87	1.57	1.77	7.50	5.04	6.31
	Median	1.00	1.00	1.00	8.50	5.00	7.00
Topography: varied	Means	4.82	3.90	4.50	8.17	6.68	7.45
	Median	5.00	2.00	4.00	9.00	7.50	8.00
Topography: aspect	Means	5.79	4.86	5.47	4.50	6.21	5.33
	Median	6.00	5.00	6.00	4.50	7.00	6.00
Water availability: human and animal consumption	Means	9.33	8.38	9.00	9.33	9.57	9.45
	Median	10.00	10.00	10.00	10.00	10.00	10.00
Water availability: irrigation	Means	9.08	8.90	9.02	5.27	7.46	6.33
	Median	10.00	10.00	10.00	5.00	9.50	7.00
Residential infrastructure: style of main residence	Means	6.13	5.43	5.88	6.07	5.14	5.62
	Median	8.00	5.00	7.00	6.00	5.50	6.00
Residential infrastructure: size of main residence	Means	6.26	5.24	5.90	5.60	3.71	4.69
	Median	7.00	6.00	7.00	6.00	3.50	5.00
Residential infrastructure: condition of main residence	Means	5.51	5.14	5.38	6.10	5.14	5.64
	Median	5.00	5.00	5.00	7.50	6.00	7.00
Residential infrastructure: historic character of main residence	Means	4.85	4.48	4.72	4.50	3.74	4.14
	Median	4.00	5.00	4.50	5.50	2.00	3.00

Annexure 15: (continued)

Variable	Statistic	INTENSIVE AREA			EXTENSIVE AREA		
		Lifestyle	Production	All groups	Lifestyle	Production	All groups
Residential infrastructure: condition of other residential units	Means	5.62	4.38	5.18	5.31	5.25	5.28
	Median	6.00	5.00	5.50	7.00	5.50	6.00
Residential infra: accommodation capacity of other residential units	Means	6.03	4.25	5.42	4.59	4.25	4.42
	Median	7.00	4.50	5.00	5.00	5.00	5.00
Residential infrastructure: condition of labour housing	Means	5.03	5.48	5.18	5.43	6.82	6.10
	Median	5.00	6.00	5.50	6.50	7.50	7.00
Residential infra: accommodation capacity of labour housing	Means	4.44	4.76	4.55	5.23	6.71	5.95
	Median	4.00	5.00	4.50	6.00	7.00	6.00
Residential infrastructure: income potential from other residential units	Means	4.92	4.62	4.82	3.43	2.54	3.00
	Median	5.00	4.00	4.50	1.50	1.00	1.00
Permanent living rights for labourers	Means	6.26	6.35	6.29	5.27	6.50	5.86
	Median	7.00	8.00	7.50	5.00	8.50	5.00
Non-residential infrastructure: condition	Means	5.82	5.75	5.80	5.69	7.11	6.39
	Median	7.00	7.00	7.00	7.00	7.50	7.00
Non-residential infrastructure: capacity	Means	6.13	5.80	6.02	5.46	6.68	6.07
	Median	7.00	7.00	7.00	6.00	7.00	6.50
Non-residential infrastructure: historical character	Means	4.00	3.50	3.83	3.50	3.29	3.39
	Median	4.00	2.00	3.00	3.00	1.00	1.50
Non-residential infrastructure: power supply	Means	9.05	8.50	8.86	4.83	7.11	5.93
	Median	10.00	9.50	10.00	4.50	9.00	6.00
Non-residential infrastructure: condition of irrigation infrastructure	Means	8.03	8.57	8.22	4.62	8.21	6.39
	Median	9.00	9.00	9.00	5.00	9.00	8.00
Non-residential infrastructure: capacity of irrigation infrastructure	Means	7.97	8.19	8.05	4.32	7.75	6.04
	Median	9.00	9.00	9.00	4.50	9.00	6.50
Non-residential infrastructure: game fencing	Means	2.46	1.90	2.27	6.53	4.15	5.40
	Median	1.00	1.00	1.00	7.50	3.00	5.00
Aesthetics: presence of natural scenery	Means	8.51	7.14	8.03	9.03	6.57	7.84
	Median	9.00	8.00	9.00	9.00	7.00	9.00
Aesthetics: presence of river, stream, river frontage	Means	6.23	5.19	5.87	7.80	6.14	7.00
	Median	7.00	6.00	7.00	9.00	6.50	7.00
Aesthetics: presence of mountain	Means	7.23	6.38	6.93	7.77	5.82	6.83
	Median	8.00	8.00	8.00	9.00	6.00	8.00
Aesthetics: presence of beautiful view	Means	9.13	6.89	8.40	8.63	6.18	7.45
	Median	10.00	8.00	9.00	9.00	7.50	8.00
Aesthetics: presence of indigenous vegetation	Means	6.08	4.85	5.66	8.83	7.64	8.26
	Median	7.00	4.50	6.00	9.00	9.00	9.00
Aesthetics: presence of trees	Means	8.13	6.35	7.53	8.07	7.54	7.81
	Median	9.00	8.00	8.00	8.00	8.00	8.00
Aesthetics: presence of dam or dams	Means	6.79	6.20	6.59	7.30	6.32	6.83
	Median	7.00	7.00	7.00	8.00	7.00	7.50
Aesthetics: presence of rural surroundings	Means	7.46	6.50	7.14	7.70	6.71	7.22
	Median	8.00	7.00	8.00	8.00	7.00	8.00
Possibility for outdoor recreation activities	Means	6.36	4.40	5.69	8.70	5.64	7.22
	Median	7.00	4.00	6.00	9.00	6.00	8.50
Possibility of water recreation activities	Means	4.87	2.80	4.17	4.60	3.29	3.97
	Median	5.00	2.00	4.00	5.00	2.00	3.00
Possibility of water: income generation from activities other than irrigation	Means	4.18	2.95	3.75	3.93	3.61	3.78
	Median	3.00	2.00	2.50	3.50	2.00	3.00
Status	Means	7.42	6.43	7.07	5.97	4.64	5.33
	Median	8.00	7.00	8.00	6.50	5.00	5.00

Note: Median scores of 7 and above are indicated in bold.

Annexure 16: Results of forward stepwise and Mallow's Cp regressions: intensive and extensive areas

Independent variable	Parameter	p-level
INTENSIVE AREA		
Stepwise regression		
Intercept	5.48	0.00
Position: setting	0.45	0.00
Productive potential: soil quality	-0.46	0.00
Availability of water for recreation activities	0.22	0.05
Multiple R ² = 0.52 Adjusted R ² = 0.49		
n = 52		
Mallow's Cp		
Intercept	7.18	0.00
Position: setting	0.52	0.00
Position: private and secluded	-0.28	0.05
Productive potential: soil quality	-0.48	0.00
Availability of water for recreation activities	0.24	0.03
Multiple R ² = 0.55 Adjusted R ² = 0.51		
n = 51		
EXTENSIVE AREA		
Stepwise regression		
Intercept	5.76	0.00
General agricultural potential	-0.6	0.00
Suitability of the property for outdoor recreation activities	0.48	0.00
Multiple R ² = 0.62 Adjusted R ² = 0.61		
n = 53		
Mallow's Cp		
Intercept	5.11	0.00
General agricultural potential	-0.42	0.00
Size of the main residence	0.32	0.00
General condition of the non-residential infrastructure	-0.26	0.02
Presence of a dam or dams for aesthetic purposes	-0.25	0.03
Suitability of the property for outdoor recreation activities	0.42	0.00
Multiple R ² = 0.70 Adjusted R ² = 0.66		
n = 49		