

THE PERCEIVED IMPACT OF HERD MANAGEMENT PRACTICES ON SUSTAINABLE SPRINGBUCK (*ANTIDORCAS MARSUPIALIS*) RANCHING IN THE EASTERN CAPE PROVINCE OF SOUTH AFRICA

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ABSTRACT

*Despite its relatively unregulated nature game ranching and utilisation is one of the more important agricultural economic activities and considered arguably the fastest growing enterprise in South Africa. Commercial springbuck (*Antidorcas marsupialis*) production systems are considered to be supreme examples of such commercial game ranching enterprises that have been established with varying degrees of efficiency and sustainability.*

Conversion to game ranching also seems to offer some answers to the increasing economic risks and decreasing sustainability associated with livestock farming in marginally profitable and low rainfall. The Eastern Cape Province is such an area.

Earlier studies and associated literature suggest that market demand is steadily becoming highly sophisticated with very clear defined demands and expectations. A thorough understanding of game ranch managers' views on sustainability is imperative in order to develop some understanding on decision making regarding sustainability.

The relative complexity of the decision making processes associated with commercial springbuck production (wildlife production) systems and the information needs of such decisions call for increased investigations into such processes. The development of instruments to assess the interrelationships of perceptions and decisions in these processes has therefore become of the utmost importance to ensure purposeful delivery of services and information to a highly competitive and diversified industry.

This study is a contribution in this process of developing an instrument with which the nature and impact of production decisions on the sustainability of the wildlife ranching enterprise could be anticipated or even predicted.

1. INTRODUCTION

Despite its relatively unregulated nature, game ranching in South Africa is generally recognised as one of the more important agricultural economic activities (Van Niekerk, 2003:1). Both as recreational activity and highly regarded tourist attraction for local and international tourists, game ranching and utilisation is considered arguably the fastest growing enterprise in South Africa (Falkena, 2003: 7; Van

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Niekerk, 2003: 1; Van Niekerk, 2006). In this growing environment, the Eastern Cape has established itself as one of the leaders in the development of the hunting market (Van Niekerk, 2003: 113).

Conversion to game ranching also offers some answers to the increasing economic risks and decreasing sustainability associated with livestock farming in marginally profitable and low rainfall areas where wildlife prospered in previous centuries (Falkena, 2003: 7). The superior adaptability of wildlife to the African climate, the increasing monetary values of wildlife and the potential for increased earnings of foreign exchange, have led to dramatically increased numbers of wildlife.

To optimise the economic gain locked up in the growing underlying demand for hunting and game viewing, large scale rehabilitation of previously cultivated lands to pastures and the increased establishment of conservancies to ensure game ranches of sufficient size have taken place (Falkena, 2003: 8).

Earlier studies and associated literature suggest that market demand is steadily becoming highly sophisticated with very clear defined demands and expectations that dictate the flow of value in the system and increase the influence of economy of scale (Falkena, 2003: 41 – 43).

This “economy of scale” refers to the dynamic feature where the relationship between the carrying capacity, the vegetation type of a region and ranch size determine the critical mass of a game ranch in order to maintain profitability and subsequently also sustainability (Falkena, 2003, p.15). Van Niekerk (2003: 2) defines a number of important risk areas posing specific challenges to game ranch decision making (and by implication to the sustainability of the enterprise), namely:-

1. The continuously changing operating environment.
2. Changing client needs, preferences and the associated need for product customization.
3. Positioning and competitive advantage in a changing market.
4. Product development and its associated continuous definition of new products.
5. The seasonal nature of hunting.
6. The limited number of trophy animals available to hunters.

Commercial springbuck (*Antidorcas marsupialis*) production systems are considered to be supreme examples of such commercial game ranching enterprises that have been established with varying degrees of efficiency and sustainability (Bothma, 2002; Falkena, 2003).

A thorough understanding of game ranch managers’ views on sustainability in guiding their production decision making behaviour is therefore imperative in order to develop some understanding on decision making regarding sustainability.

2. OBJECTIVES OF THE PAPER

It stands to reason that the ever changing and dwindling status of the natural resources of the world and the increasing demands on the competitiveness of commercial game utilization enterprises have a marked influence on the decision making environment of game ranch managers (Van Niekerk, 2003; Van Niekerk, 2006).

Broader research into the agricultural and similar decision making frameworks over many years suggests that the role of perception in the production decision making process of the game rancher is very prominent (Tolman, 1967; Düvel, 1991: 77) and directly influences decision making regarding the potential sustainability of the undertaking.

This paper is subsequently set to achieve the following:-

- a. To identify and analyse the perceived prominent decision making areas associated with game management decision making relating to sustainability;
- b. To contribute purposefully to the development of a conceptual framework for the optimization of the efficiency of game ranching decision making in the hunting industry of the Eastern Cape specifically and South Africa in general.

Sustainability

In the context of this study sustainability (as a *measure of efficiency*), implies the ability of a commercial game production system (in this case commercial springbuck production) to sustain itself over a prolonged period of time (sometimes over generations) Sustainability measures should also consider commercial-, production- and ecological aspects in an interrelated production system (Lategan, 2007: 43).

The sustainability and, to large extent, profitability, of any agricultural or game ranching enterprise is greatly influenced, if not determined, by the physical or natural characteristics of the production environment. This also holds true for commercial springbuck production systems.

3. HOW IMPORTANT ARE DECISIONS REGARDING SUSTAINABILITY?

The comprehensive significance associated with decisions regarding sustainability can reasonably be regarded to be directly related to the fundamental value attached to them. Generally the value of decision outcomes are associated with:-

- a. an *experience value* (the degree of pleasure or pain, satisfaction or anguish in the actual experience of an outcome), and
- b. a *decision value* being the contribution of an anticipated outcome to the overall attractiveness or non-acceptability of an option in a choice, albeit not always an explicit distinction (Kahneman & Tversky (2000a: 15).

Under normal conditions decision making areas associated with sustainability decisions, as related to in this paper, are often linked to some objective reality or interpretation linked to an external point of reference (like a scientific basis, a group decision, a natural law, etc.). Botterill and Mazur (2004: 7–10) and Lategan (2007: 163) put forward that this linkage has a direct bearing on the efficiency of outcomes and makes it difficult to predict or sometimes even anticipate the actual experience that outcomes will produce.

This somewhat common disparity between experience value and decision value very often introduces an additional element of uncertainty or risk in many decisions relating to sustainability (Kahneman & Tversky, 2000a: 16). The acceptability of a

decision making option therefore largely depends on whether a negative outcome is evaluated or “framed” as a cost or an uncompensated loss (Kahneman & Tversky, 2000a: 1).

This is particularly significant in the case of sustainability decision making where “non-sustainability” is often framed as an uncompensated loss, creating some element of justification for unrealistic expectations.

To illustrate the complexity of this paradigm framework and the resulting differential preferences, the frequency of decision making alien to those expected from a more “rational” decision making stance, particularly regarding sustainability, will be considered (Foster & Rausser, 1991: 287; Kahneman & Tversky, 2000b: 45; Botterill & Mazur, 2004: 7 – 10; Lategan, 2007: 164).

Another often considered distinctive feature of agricultural decision making is the seemingly constant underestimation of the probability of very likely events (often associated with desired outcomes) occurring as opposed to the seemingly constant overestimation of the probability of very unlikely events (often associated with undesired outcomes) occurring (Gladwin & Murtaugh, 1984: 120 – 121; Lategan, 2007: 164).

In an attempt to delineate the influence of risk perception in this decision making, this paper endeavours to identify and define the relative prominence of different decision making areas in commercial springbuck production decision making.

4. THE RESEARCH PROCESS

Being a predominantly phenomenological study, this type of research uses a stimulus – response approach of observation and behaviour, assuming that a specific item has a common meaning for every respondent and that every response has a common meaning when given by different respondents. The quest is to maintain enumerator neutrality (Babbie, 1990: 188; Lategan, 1994).

As part of a larger investigation into the role of risk perception in commercial springbuck (*A. marsupialis*) production decision making, open ended question and response data collection techniques were used. To purposefully include such responses later in the analyses calls for special measures aimed at unifying responses into more manageable units of meaning for comparison.

The continuous predominantly retrospective and prospective nature of interviewing makes it possible for respondents and enumerators to interpret questions and responses differently. To overcome this potential source of confusion, both quantitative and qualitative responses are recorded with the purpose to maintain a system of continuous cross referencing and analysis to ascertain intensity, discrepancy or magnitude in certain phenomenological concepts like perceptions and perspectives.

Following the recommendations of Malhotra & Burks (1999: 180 – 182), as cited by Van Niekerk (2003: 30) and integrating them with the techniques evaluated by Lategan & Düvel (1992), the following actions were implemented to create an environment conducive to purposeful response:

- a. For the purpose of this study small interview groups of between 5 and 8 respondents were used while upholding the following measures to ensure a neutral environment;
- b. Limiting interactions to questions and clarifying remarks;
- c. Explaining the importance of personal and unbiased responses;
- d. Disallowing alterations to questions already dealt with (“first response is lasting response”);
- e. Ask probing questions to enhance understanding of the different types of questions capturing quantitative and qualitative responses.

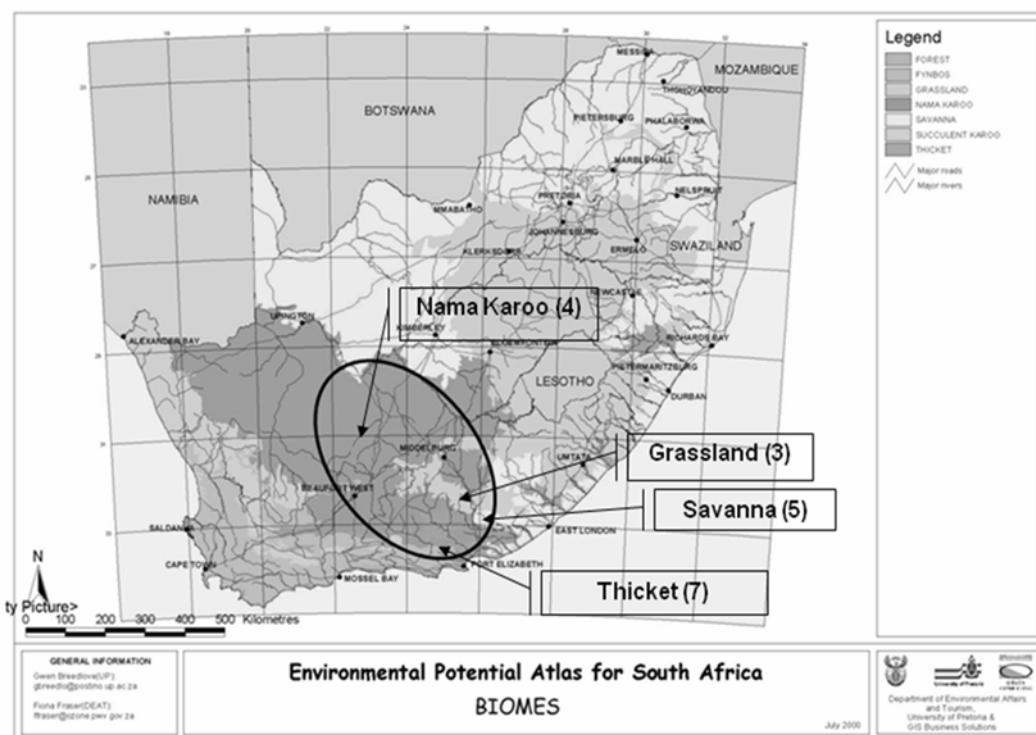
Being experienced in this type of interviewing and data collection, the researcher conducted and managed all group discussions personally.

5. THE RESEARCH AREA

Despite numerous reports on financial aspects concerning the game ranching industry in different areas of South Africa by Eloff (1999), Falkena (2003) and Van Niekerk (2006), the decision was made to limit the study to commercial springbuck production (ranching) in four major production areas (biomes) occurring in the Eastern Cape, Northern Cape and Western Cape.

The study was conducted in the mentioned regions for the following reasons:

- a. Reports of Van Niekerk (2002) and Falkena (2003), emphasised the commercial value and importance of ranching with springbuck in these regions, based on the importance of the industry in terms of numbers of springbuck kept, allocation of land use and contribution to the local economy (Lategan, 2007: 90).
- b. Van Rooyen (2002: 37) describes the area as particularly well suited for the habitat requirements of springbuck. Map 1 illustrates the location of the research area and the different biomes represented in the area.



- c. By distinguishing different biomes the potential complexities in the purposeful gathering of relevant and tested information on the production environment and related risk perceptions and factors caused by marginal environmental production factors could be purposefully validated.
- d. Historically the biomes are known to be highly productive and lucrative springbuck ranching areas (Roche, 2005). This created a reasonable expectation of suitable respondents offering credible, accurate and purposeful responses to a very comprehensive interview questionnaire (Lategan, 2007: 90).

6. COMMERCIAL SPRINGBUCK PRODUCTION SYSTEMS AS AGRICULTURAL ENTERPRISES

This paper specifically involves an investigation of the role of sustainability issues in production decision making in commercial springbuck production enterprises. This is done as an effort to probe into the role of such decision making in the broader game ranch management decision making environment.

Commercial springbuck production is commonly accepted as an economically significant enterprise having to deal with similar management, innovation and production decision making challenges and skill associated with “normal” commercial agricultural practice (Bothma, 2002: 358; Lategan, 2007: 58).

Not dissimilar to the broader game ranch management scenario, a series of interactions between ecological factors and interactions generally determines the inherent production potential associated with a commercial springbuck production system (as illustrated in Figure 1).

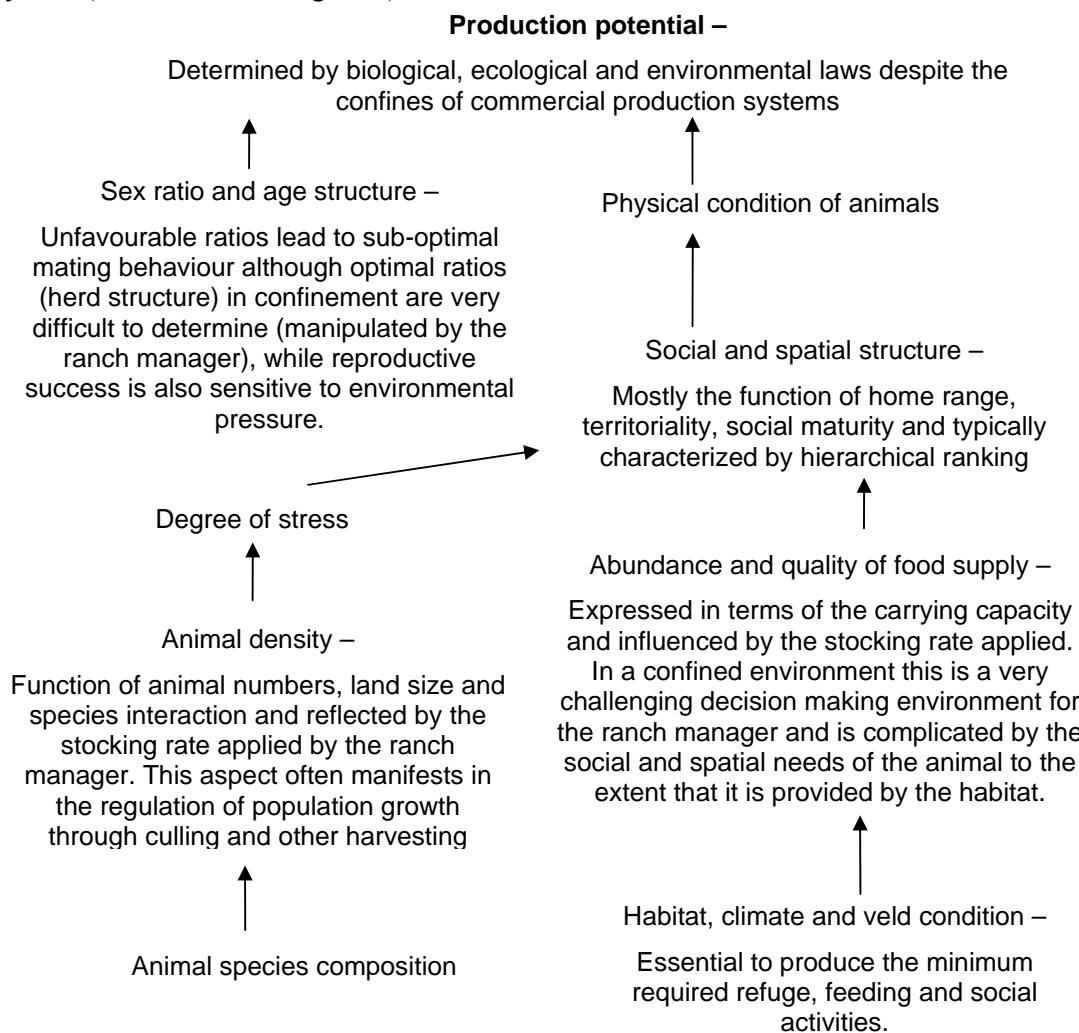


Figure 1: Illustration of the most important interactions influencing production in Springbuck production systems (after Furstenburg, unpublished; Furstenburg, 2006; Lategan, 2007: 111).

Whilst taking cognizance of the important interactions and ratios in natural springbuck production systems (Furstenburg, 2006: 9), the eventual influence of these interactions on commercial wildlife production (Furstenburg, unpublished; Bothma, 2002: 171) and the importance of sustainability of production on the eventual profitability of commercial wildlife (springbuck) production systems (Eloff, 1999; Falkena, 2002: 67 – 72; Briel, 2006) it can rightfully be argued that:

- a. Springbuck production (and general game production systems) is largely still undomesticated, albeit natural or commercial;
- b. Any form of reasonable production is only possible when ecological principles and ratios, as the basic drivers of production potential, are adhered to either

through conservation mechanisms or commercial ranching decision making; and that

c. Variation in production due to the variability and often non-seasonal nature of reproduction by many game species (springbuck in this case), irrespective whether in the natural environment or within the confines of a commercial production system, has a marked influence on game ranching sustainability (Lategan, 2007: 112).

It is essential to achieve optimum economic and production efficiency to ensure sustainability in terms of production, commercial development and social acceptance (Hoffman, Muller, Schutte & Crafford, 2004: 123).

Variability in the efficiency of decision making concerning the very important production criteria illustrated in Figure 1 is more often than not the result of variability in sustainable production (Lategan, 2007: 106).

It can therefore be argued that the challenge within the confines of commercial springbuck (or any other game) production systems are more often than just the establishment of a *status quo* of sustainable production systems demanding accurate management decision making (Furstenburg, unpublished: 3 – 8).

7. FINDINGS

In this exploratory study respondents were requested to indicate the various decision making areas they perceived to impact most on the achievement of perceived optimum sustainability in a commercial springbuck production system.

Decision making areas are groupings of perceived related decisions consisting of associated facts, influences, knowledge, activities (practices) or events perceived to mutually contribute to a common outcome, in this case efficiency (Lategan, 2007: 172).

Table 1: The major perceived decision making groups and their associated numerical coding

Decision making areas	Numerical code
Production environment	1
Herd management	2
Marketing and client satisfaction	3
Product offering and harvesting	4
Economic and financial	5

7.1 Herd structure as most representative and implicit reference to herd management.

Responses by participating farmers indicate herd management as macro grouping and include a variety of responses and perceptions (Lategan, 2007: 181).

Table 2: Frequency distribution of data confirming perceived decision making areas associated with herd structure as most prevalent aspect of herd management.

Herd management aspects perceived to be influential	No.	%
Aspects and components relating to Herd Structure		
Buying of new breeding animals	1	
Efficient management of ewes	2	
Efficient management of older rams	3	
Efficient management of young rams	1	
Following special breeding programmes	4	
Manage sex ratio composition of harvest	2	
Management aimed at improving reproduction	2	
Management of herd age structure	2	
Management of herd sex ratio composition	4	
Management of herd size	4	
Management of herd structure	1	
Managing for improved reproduction rate	2	
Selection of rams for breeding	4	
TOTAL	32	74.4
Aspects and components relating to herd management		
Feed and health management of herd	2	
Feed and health status of animals	2	
General herd management practices	1	
Implementation of new technology	1	
Management of trophy animals	4	
Selection for greater carcass size animals	1	
TOTAL	11	25.6

Table 2 reflects these perceived interactions and identifies the commonly most important perceived components of herd structure and herd management as indicated by respondents. It is imperative to remember that management decision making contains components of both technical and preference decisions (Bothma, 2002: 37) as reflected in the analysis shown in Table 5.1, although they cannot always readily be isolated.

It is therefore considered justified to use herd structure as the most representative and therefore implicit reference when herd management is mentioned or discussed in analyses.

7.2 Perceived importance of different decision making areas in achieving perceived optimum efficiency

Figure 2 reflects the different frequencies of responses concerning the decision making areas consistently perceived to be the most significant with regard to their direct influence on the sustainability in commercial springbuck production systems.

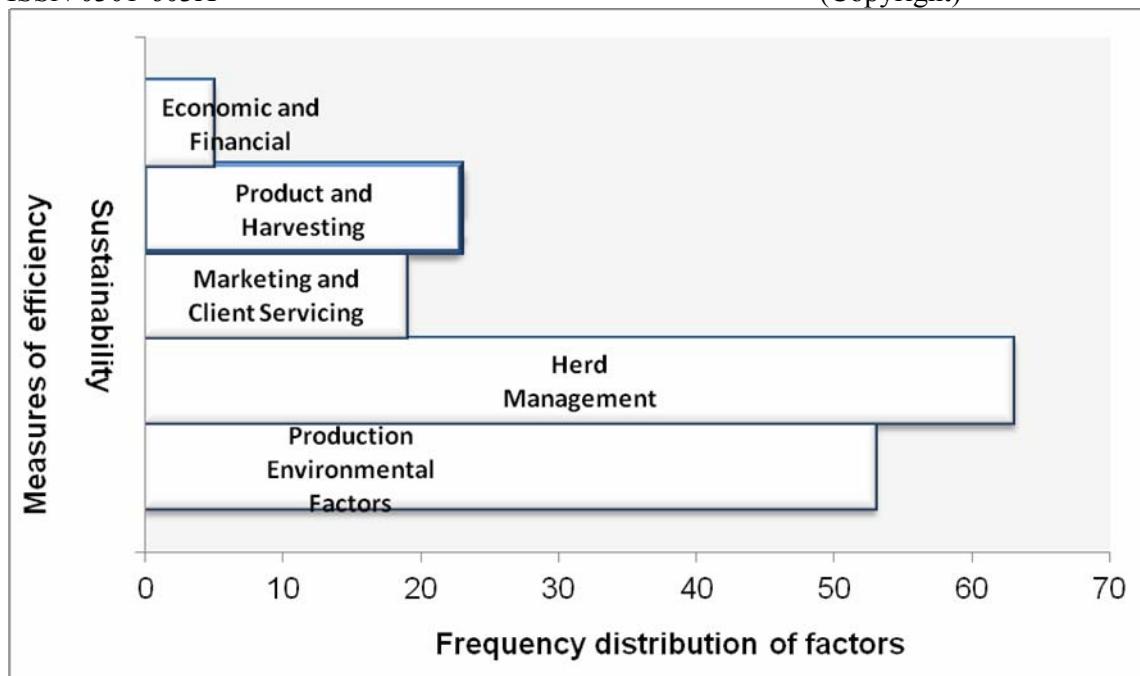


Figure 2. A graphic illustration of the matrix of decision making areas perceived to most prominently influence the optimum achievement of the different measures of perceived efficiency.

Overall indications are that the different decision making areas associated with the achievement of sustainability vary with regard to their relative importance and perceived influence on the optimum achievement of sustainability. Decisions regarding herd management are consistently perceived to be the most important decisions. These decisions particularly centred on issues pertaining to herd sex ratio and age structure management, breeding programmes and improved reproduction rate (Lategan, 2007: 173 – 174).

7.3 Perceived importance of different decision making areas in achieving perceived optimum sustainability

Respondents were subsequently requested to rank the three most important decision making areas they perceived to impact the most on the achievement of perceived optimum efficiency (sustainability in particular) in a commercial springbuck production system.

With regard to *sustainability* herd management factors (read: herd structure) and production environmental decision making areas seem most prominent in achieving perceived optimum yield, while it's noticeable how the relative importance of the different macro groupings tend to increase to form a matrix of rather similar influences and factors.

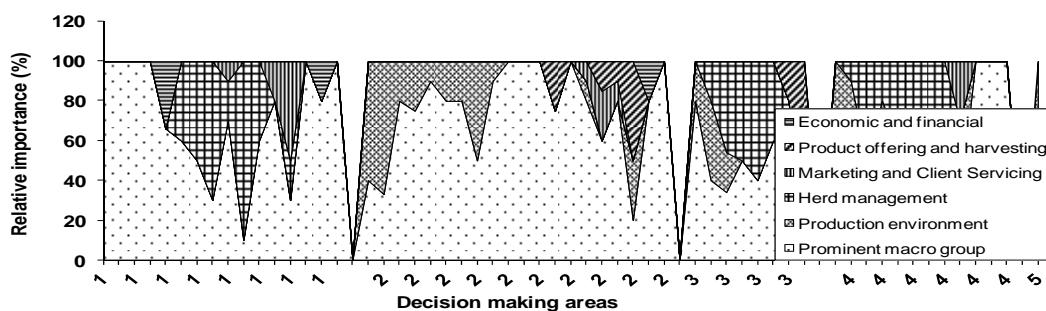


Figure 3: The perceived relative importance of a complex of decision making areas associated with the achievement of optimum **sustainability**

Although herd management factors (read herd structure) still seems to be the most important decision making area influencing optimum **sustainability**, production, environmental and product offering and harvesting decisions contribute significantly, thus creating a rather complex matrix of influencing decision making areas.

Looking at the above array of decision making areas subjectively perceived to be associated with the achievement of optimum efficiency, the complexity of the decision making process comes to the fore, evoking the following comments and questions:

1. Herd management (herd structure) plays a very significant and important perceived role in achieving optimum efficiency in all the different facets and measures of efficiency.
2. When looking at the overall composition of the perceived array of factors influencing the achievement of optimum efficiency, the sheer complexity of the situation tends to create the impression that achieving optimum efficiency in all the different facets and measures will be a near impossible task.
3. *How can the different interactions influencing the achievement of optimum efficiency be managed purposefully and the underlying interactions and their secondary influences anticipated sufficiently in order to manage the achievement of optimum efficiency?*

7.4 Management decision making accuracy

In the context of this investigation, management decision making accuracy refers to the subjective assessment of the degree of accuracy of management practice decision making (technical and preference decision making) associated with the successful achievement of the intended objectives (usually expressed in terms of the facets or measures of efficiency) (Lategan, 2007: 39).

This equates to the *perceived maximum potential impact from judgmental errors or incorrect decisions that could be absorbed by the production system before a significant movement away from the achievement of the intended objectives would occur*.

An important observation in this regard is the extent and magnitude of the seemingly comprehensive and integrated perceived influence or relationship that herd management (herd structure by implication) has with different decision making areas in different scenarios. The nature and extent of this relationship is still something to be investigated.

This finding is supported by an overwhelming number of indications suggesting a great deal of optimism with regard to the leniency associated with the degree of management decision making accuracy perceived essential to achieve optimum levels of efficiency for the different facets and measures of efficiency.

Figure 4 reflects a summarized illustration of these conceptualized interactions and their impact on the sustainability of the enterprise.

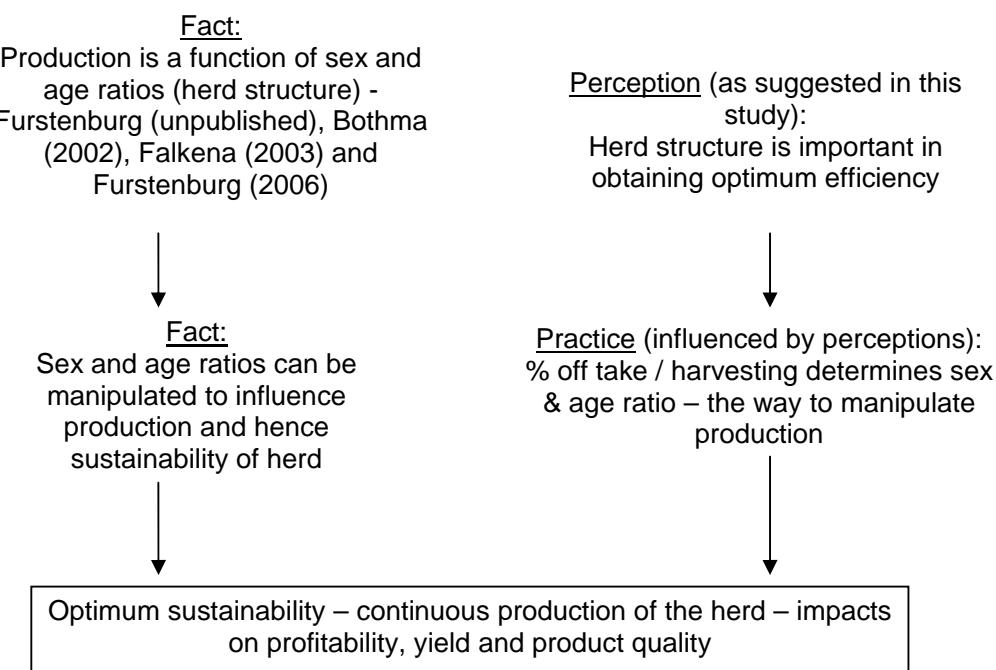


Figure 4: A summary illustration of the comparative roles of fact and perception in the achievement of sustainable optimum efficient herd production.

The average perceived harvest (utilization) associated with optimum efficiency (sustainability) at different levels of management decision making accuracy is indicated in Figure 5.

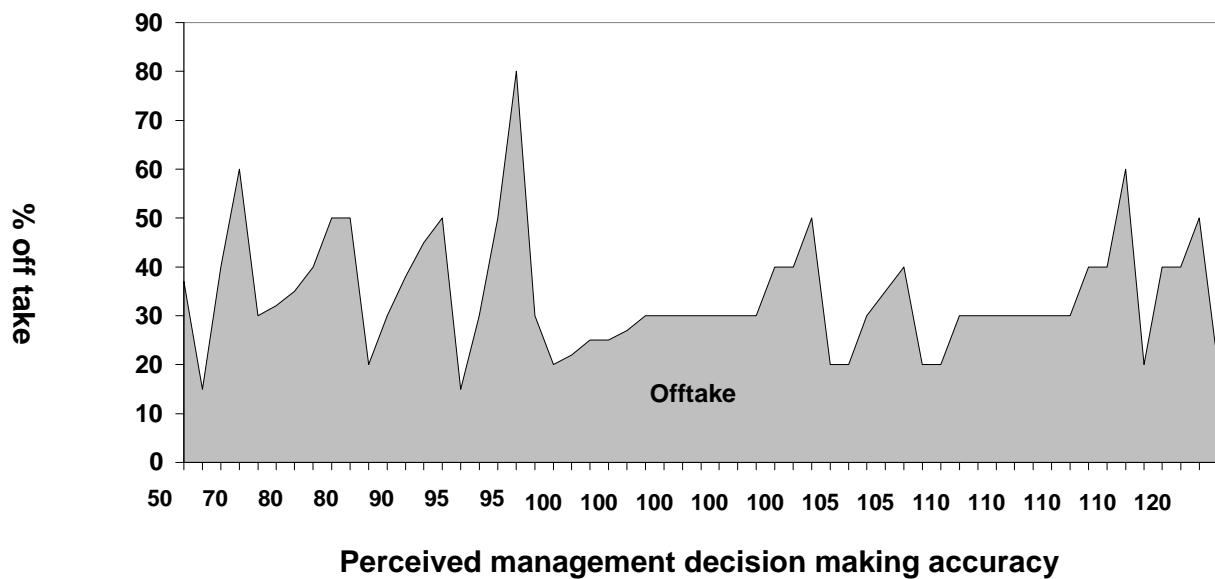


Figure 5: The perceived levels of management decision making accuracy associated with harvest for optimum sustainability.

The illustration in Figure 5 suggests that perceived management decision making accuracy does not significantly influence the percentage harvest perceived to be associated with the achievement of optimum sustainability.

The absence of a significant Spearman Rank Correlation Coefficient association confirms this suggestion. Indications from Figure 5 are that the intensity of utilization is marginally higher where the need for management decision making is perceived to be more accurate (higher perceived risk) to achieve optimal sustainability, although not significantly so.

Indications are therefore that decision making concerning the percentage harvest is not strongly considered part of the perceived management decision making accuracy associated with the achievement of optimum sustainability.

8. CONCLUSIONS

It is quite clear that different challenges (in this case the challenges posed by the measures and facets of efficiency) are perceived to attract different sets of decisions.

The array of decision making areas subjectively associated with the achievement of perceived optimum efficiency clearly gives an indication of the complexity of the decision making process in commercial springbuck production systems. Herd management (by implication herd structure) is consistently perceived to play a very important role in achieving perceived optimum.

Indications are that, to various degrees, all decision making areas are perceived to interact with all other aspects all the time in terms of the influence on efficiency. This

seems to highlight the complexity of decision making processes, immediately emphasising the crucial role of the comprehensive flow of knowledge and information to support and improve management decision making accuracy associated with optimum efficient production.

The relative complexity of the decision making processes associated with commercial springbuck production (wildlife production) systems and the information needs of such decisions call for the definite increased need establishment of extension and research structures to serve the commercial needs of springbuck ranchers.

The development of instruments to assess the interrelationships of perceptions and decisions has therefore become of the utmost importance to ensure purposeful delivery of services and information to a highly competitive and diversified industry. In this sense perceived management decision making accuracy could offer a very powerful instrument against which the impact of production decisions on the sustainability of the wildlife ranching enterprise could be anticipated or even predicted.

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