

AN ANALYSIS OF PERCEIVED PROMINENT DECISION MAKING AREAS IN COMMERCIAL SPRINGBUCK (*ANTIDORCAS MARSUPIALIS*) PRODUCTION DECISION MAKING¹

F.S Lategan² and P. du P. van Niekerk³

Correspondence author: Dr F.S. Lategan, Agricultural Extension Specialist,
Dept. Agricultural Economics and Extension, University of Fort Hare, ALICE.

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ABSTRACT

*The development of the highly individualistic commercial springbuck (*Antidorcas marsupialis*) production systems and the resulting growth in the commercial value of the springbuck has opened a new realm of game management decision making. These relatively undomesticated production systems demand sophisticated technical and preference decisions in an effort to reconcile ecological, commercial and management principles and practices into efficient production units.*

This paper endeavours to identify and define the relative prominence of different decision making areas in commercial springbuck production decision making, using qualitative and quantitative techniques associated with phenomenological studies. Overall indications are that a clear understanding exists that different challenges (of achieving perceived optimum efficiency) attract different sets of decisions.

The array of decision making areas subjectively associated with the achievement of perceived optimum efficiency suggests the complexity of the decision making process in commercial springbuck production systems. A major need for research and information generation and distribution (extension) concerning the effects of herd structure and management on commercial springbuck production is identified.

¹ Extracted from a thesis submitted to the Nelson Mandela Metropolitan University in Port Elizabeth as complete fulfillment for the DTech: Agriculture degree.

² Agricultural Extension Specialist, Dept. Agricultural Economics and Extension, University of Fort Hare, ALICE.

³ Professor and Head of Department Agriculture and Game Management, Faculty of Science, Nelson Mandela Metropolitan University, Port Elizabeth.

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.

1. INTRODUCTION

The economic value of wildlife is reaching proportions beyond reasonable expectations. Worldwide the marketable values of many wildlife species have reached all time maximums – a phenomenon that is considered “encouraging and alarming from a historical perspective” (Czech, 2000: 3), thus creating the impression that *commercial markets and natural ecosystems are uneasy partners*.

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). Commercial springbuck (*A. marsupialis*) production systems have been established with varying degrees of efficiency, despite the springbuck essentially being a free roaming herbivore (Bothma, 2002 and Falkena, 2003).

Decision making associated with these dynamic commercial springbuck production systems demand a reliable flow of relevant and accurate information while the cost of non-performance associated with improper decision-making and/or less than adequate implementation poses a real risk to decision makers (Bothma, 2002:25–29. Falkena, 2003:1–10 and Furstenburg, unpublished: 1–3).

Research over many years suggests that the influence of perception on the production decision making process of the game rancher is very prominent (Tolman, 1967; Düvel, 1991: 77). A thorough understanding of risk perception in guiding the production decision making behaviour of the game rancher is therefore imperative.

2. OBJECTIVES OF THE PAPER

It clearly stands to reason that the ever changing and dwindling status of the natural resources of the world have a marked influence on the decision making environment of natural resource users and their associated information needs. This increases the need for studies into decision making concerning the economic use of natural resources.

Hunting is not dissimilar to such activities (Van Niekerk, 2003 and Van Niekerk, 2006).

This paper is subsequently set to achieve the following:-

- a) To identify and analyse the prominent perceived decision making areas associated with game management decision making relating to the achievement of optimal efficiency regarding product quality;
- b) To identify and analyse the prominent perceived decision making areas associated with game management decision making relating to the achievement of optimal efficiency regarding yield;
- c) To identify and analyse the prominent perceived decision making areas associated with game management decision making relating to the achievement of optimal efficiency regarding profitability;
- d) To identify and analyse the prominent perceived decision making areas associated with game management decision making relating to the achievement of optimal efficiency regarding sustainability.

It is envisaged that this investigation could 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.

3. RISK PERCEPTION – A CONCISE CONCEPTUALIZATION

Risk perception is the subjectively perceived probability of the non-achievement of the desired outcome defined in the decision making of the individual (Lategan, 2007:41). It can be described in terms of a social and cultural construct reflecting values, symbols, history and ideology and has as basis the variability of human social existence. It is not a quantifiable value but rather the cumulative result of a matrix of perceived factors, largely determined by contexts (Sjöberg, Moen & Rundmo, 2004:8).

These factors can also reasonably be described as “forces or influences that exert extraordinary non-linear force on the decision making process in terms of their perceived contribution to “convince” the decision maker to follow or not follow a particular line of reasoning, decision making or even judgment – sometimes alienated from the accepted and established line of reasoning associated with that of accepted decision making areas” (Lategan, 2007:161–164).

These so-called “decision-weights exerting non-linear decision responses” (Kahneman & Tversky, 2000:xi) are realities that cannot be ignored. As a classic example earlier research suggests that raising the probability of a certain outcome from 0.39 to 0.40 has far less impact on preference decision making than raising the probability of the same outcome from 0 to 0.01 or from 0.99 to 1.00 (Kahneman & Tversky, 2000:45 and Kahneman & Tversky, 2000b:45).

Another important aspect is that non-linear weighting tends to discriminate between the desirability of the outcome, the base from where probabilities are projected and the perceived conclusiveness of outcomes in terms of the probability of occurrence (after Plous, 1993:69–70; Kahneman & Tversky, 2000a:xi and Tversky & Fox, 2000:93–94).

It can therefore reasonably be accepted that the prominence or probability of a particular outcome is not the only force that exerts a certain specific pressure on decision making.

4. THE FUNDAMENTAL VALUE OF DECISIONS

The comprehensive significance associated with decisions can reasonably be regarded to be a function of the fundamental value attached to it. Kahneman & Tversky (2000a:15), in a concluding remark, associates the value of decision outcomes 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.

Positive and negative outcomes are normally separated through forces or influences like the ability to adapt as well as the objective *status quo*, expectations and social comparisons (Kahneman & Tversky, 2000a:16). Under normal conditions these decision making areas are usually linked to some objective reality or interpretation with an external point of reference (like a scientific base, a group decision, a natural law, etc.) directly bearing on the efficiency of outcomes and making it difficult to predict or sometimes even anticipate the actual experience that outcomes will produce (Botterill & Mazur, 2004: 7 – 10; Lategan, 2007: 163).

Kahneman & Tversky (2000a:16) draws attention to the additional element of uncertainty or risk, this somewhat common disparity between experience value and decision value introduces in many decision making problems. The acceptability of a decision making option often depends on whether a negative outcome is evaluated as a cost or an uncompensated loss (Kahneman & Tversky, 2000a:1).

This paradigm framework is often found when evaluating farming practice or game ranching decision making where this framing of options (e.g. in terms of gains or losses) yield systematically different preferences resulting in decisions alien to those expected from a more “rational” decision making stance (Foster & Rausser, 1991:287, Kahneman & Tversky, 2000b:45, Botterill & Mazur, 2004:7–10 and Lategan, 2007:164).

The phenomenon of a seemingly constant underestimation of the probability of very likely events (sometimes associated with desired outcomes) occurring as opposed to, the seemingly constant overestimation of the probability of very unlikely events (sometimes associated with undesired outcomes) occurring, is also a distinctive feature of agricultural decision making (Gladwin & Murtaugh, 1984:120–121 and 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.

5. 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 maintaining enumerator neutrality (Babbie, 1990:188 and 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.

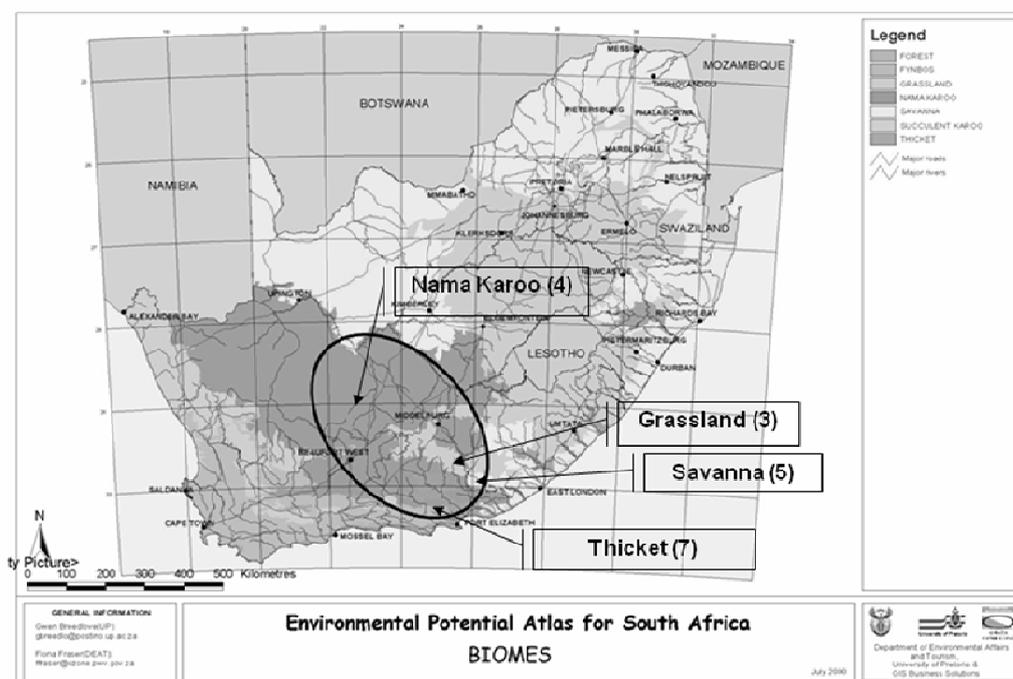
Being experienced in this type of interviewing and data collection, the researcher conducted and managed all group discussions personally.

6. THE RESEARCH AREA

Despite the numerous reports on the 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 the commercial production (ranching) with springbuck 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 the numbers of springbuck kept, the allocation of land use and the 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.



Map 1: An illustration of the location of the research area and the different biomes represented in the area

d) Historically the biomes are known to be very 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).

7. COMMERCIAL SPRINGBUCK PRODUCTION SYSTEMS AS AGRICULTURAL ENTERPRISES

Commercial springbuck production enterprises are commonly accepted as economically significant practices, worthy of and demanding the same, if not more, management, innovation and production decision making and skill associated with any “normal” purposeful commercial agricultural practice (Bothma, 2002:358 and Lategan, 2007:58).

The inherent production potential associated with a commercial springbuck production system is generally the result of a series of interactions between ecological factors and interactions as illustrated in Figure 1.

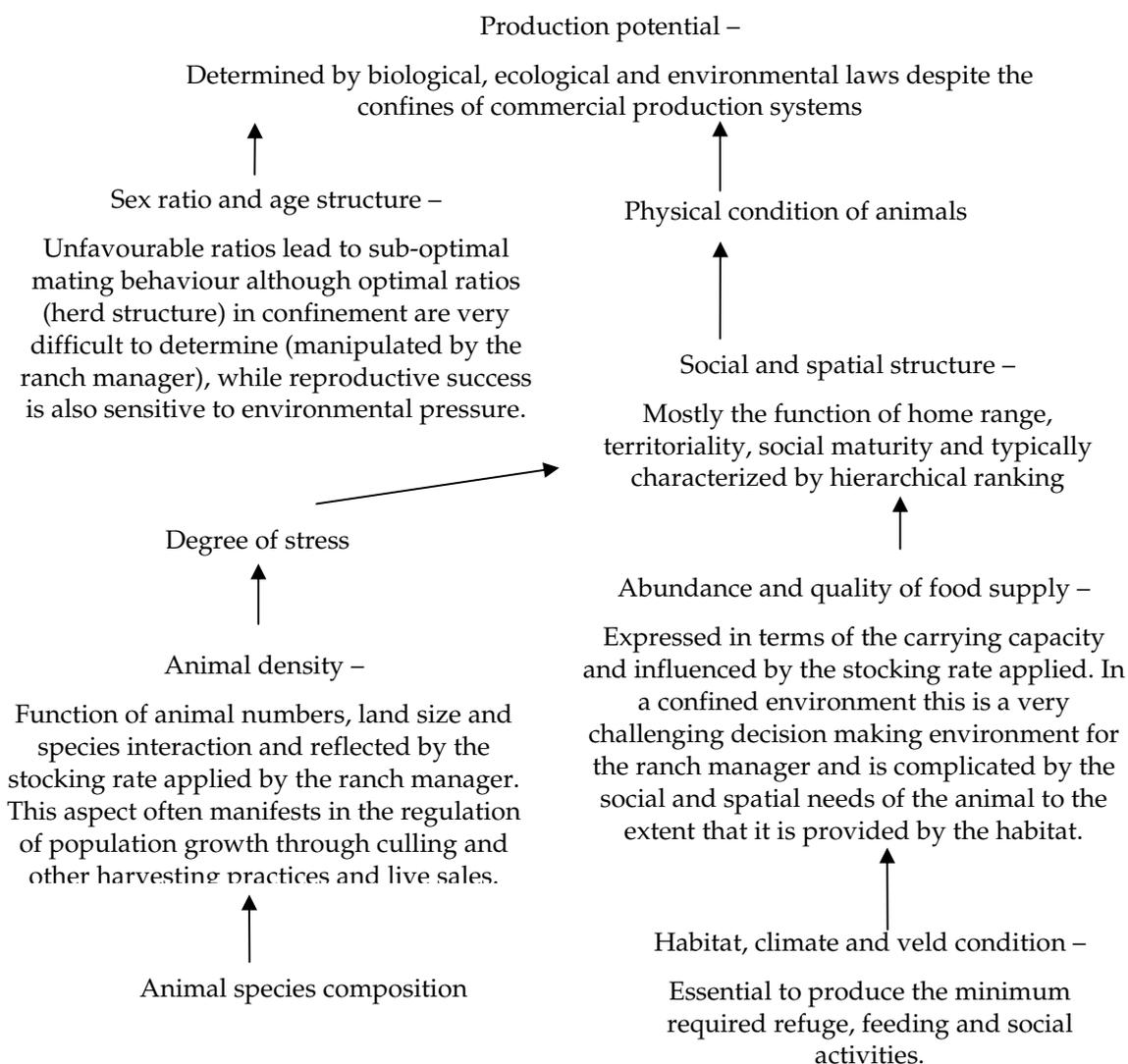


Figure 1: Illustration of the most important interactions influencing production in springbuck production systems (after Furstenburg, unpublished; Furstenburg, 2006 and Lategan, 2007:111)

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 production (Furstenburg, unpublished and Bothma, 2002:171) and the importance of efficiency of production on the eventual profitability of commercial springbuck production systems (Eloff, 1999, Falkena, 2002:67-72 and Briel, 2006) it can rightfully be argued that:

- a) Springbuck production 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 non-seasonal nature of reproduction by springbuck, irrespective whether in the natural environment or within the confines of a commercial production system, has a marked influence on game ranching efficiency and profitability (Lategan, 2007:112).

The achievement of maximum economic efficiency and optimum production efficiency is essential for sustainability in terms of production, commercial development and social acceptance of this relatively new agricultural enterprise in South Africa (Hoffman, Muller, Schutte & Crafford, 2004:123).

Variability in the efficiency of decision making concerning the very important production criteria illustrated in Figure 1 (after Bothma, 2002:204–205, Furstenburg, unpublished: 3–8 and Furstenburg, 2006:7–11) is more often than not the result of variability in production efficiency (Lategan, 2007:106).

It can therefore be argued that the challenge within the confines of commercial springbuck production systems is more often than not the establishment of a *status quo* of production efficiency demanding accurate management decision making (Furstenburg, unpublished: 3–8).

8. FINDINGS

Respondents were requested to indicate the various decision making areas perceived to impact on the achievement of perceived optimum efficiency in a commercial springbuck production system. Decision making areas are considered to be groupings of perceived related decisions incorporating associated facts, influences, knowledge, activities (practices) or events perceived to mutually contribute to a

common outcome, in this case efficiency (Lategan, 2007:172). These groupings are reflected in Table 1 and will serve as key to Figures 3 through 6.

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

Decision making areas	Numerical Code	Pattern coding
Prominent macro group		
Production environment	1	
Herd management	2	
Marketing and client satisfaction	3	
Product offering and harvesting	4	
Economic and financial	5	

The prominent macro group is identified as per pattern coding for each separate figure only without any numerical code. The decision making area number as indicated on the X – axis (as per key in Table 1) serves as identification of prominent decision making area.

8.1 Herd structure as most representative and implicit reference to herd management

From open ended responses it became clear that herd management, as macro grouping, consists of a variety of responses and perceptions all related to the context of herd management (Lategan, 2007:181).

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 2, 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.

Table 2: Frequency distribution of data confirming perceived decision making areas related to herd structure as being the 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

8.2 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 all the different facets and measures of perceived efficiency in commercial springbuck production systems.

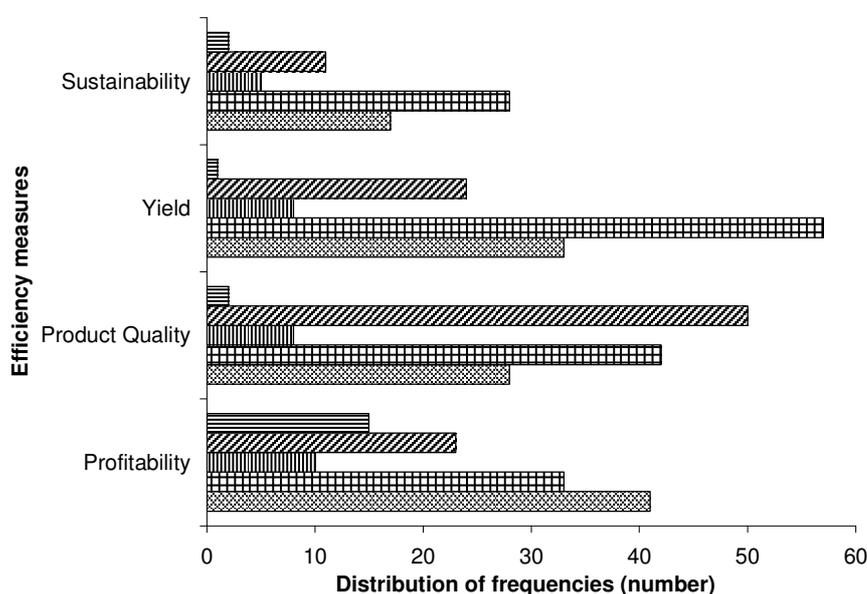


Figure 2: A graphic illustration of the matrix of decision making areas perceived to most prominently influence the optimum achievement of the different measures of perceived efficiency (see Table 1 for key to pattern coding)

Overall indications are that the different decision making areas vary with regard to their relative importance and perceived influence on the optimum achievement of the different measures of efficiency. 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 herd age structure management, breeding programmes and improved reproduction rate (Lategan, 2007:173–174).

Closely following are decisions concerning factors influencing the production environment with particular reference to decisions concerning infrastructure, handling facilities and grazing conditions.

Decisions regarding products and harvesting were also considered to be important (as reflected by the distributions of frequencies), specifically with regard to issues pertaining to the efficiency of the organizing and practical implementation of the harvesting method (reflecting in the open ended responses of respondents).

Respondents were subsequently requested to indicate the relative importance of the three most important decision making areas perceived to impact on the achievement of perceived optimum efficiency in a commercial springbuck production system. These responses with regard to the different facets and measures of efficiency are indicated in Figures 3–6 (refer to pattern coding key indicated in Table 1).

8.3 Perceived importance of different decision making areas in achieving perceived optimum yields

Of particular interest are the various associations with regard to the relative importance of different decision making areas in the achievement of perceived optimum *yields* (as illustrated in Figure 3).

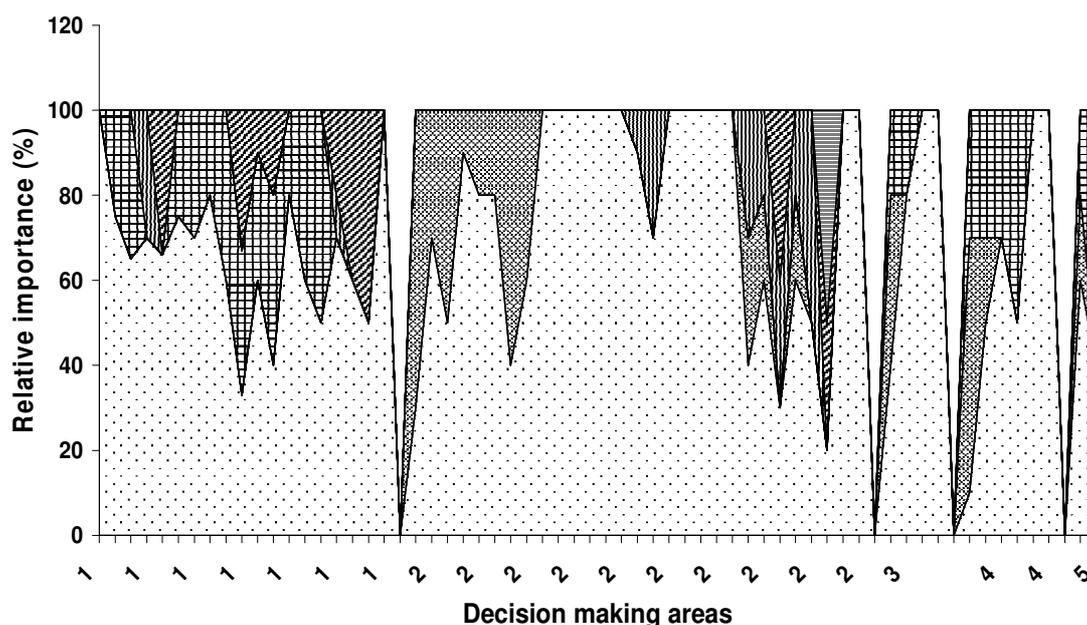


Figure 3: The perceived relative importance of a complex of decision making areas associated with the achievement of optimum yields

The achievement of perceived optimum *yields* illustrates the important perceived interactive grouping association between production environment and herd management factors (deemed the most prominent), product offering and marketing factors.

8.4 Perceived importance of different decision making areas in achieving perceived optimum product quality

With regard to *product quality* (Figure 4) decision making areas evolving mostly around herd management factors (read: herd structure) and production environmental decision making areas are considered the most prominent in achieving optimum product quality.

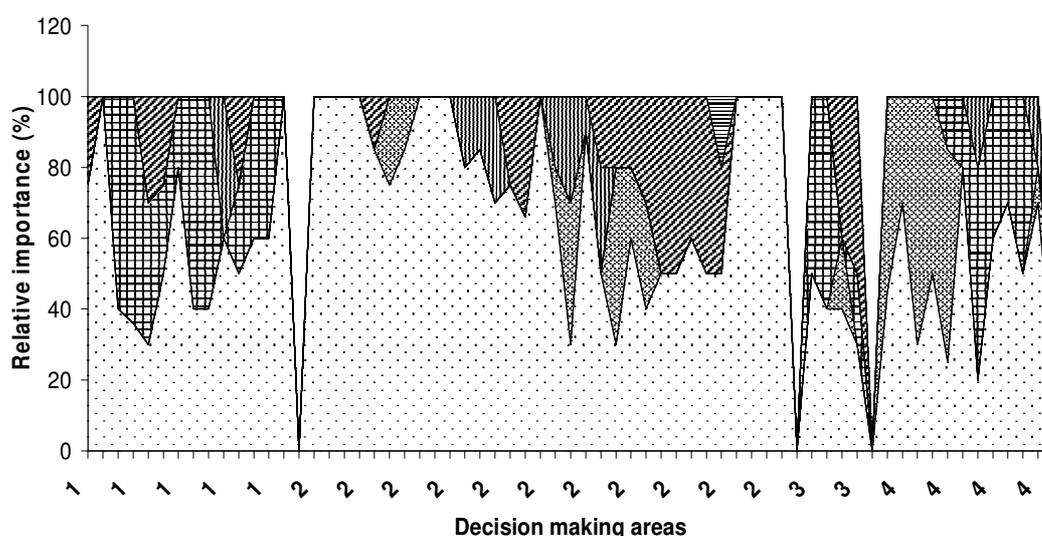


Figure 4: The perceived relative importance of a complex of decision making areas associated with the achievement of optimum product quality

The relative importance of the associated decision making areas is, however, not so prominent, thus creating the impression that herd structure is a very important decision making area *per se* with regard to the achievement of optimum product quality.

8.5 Perceived importance of different decision making areas in achieving perceived optimum profitability

With regard to *profitability* (Figure 5) decision regarding production environment, herd management (herd structure) and marketing and client satisfaction were considered very prominent decision making areas.

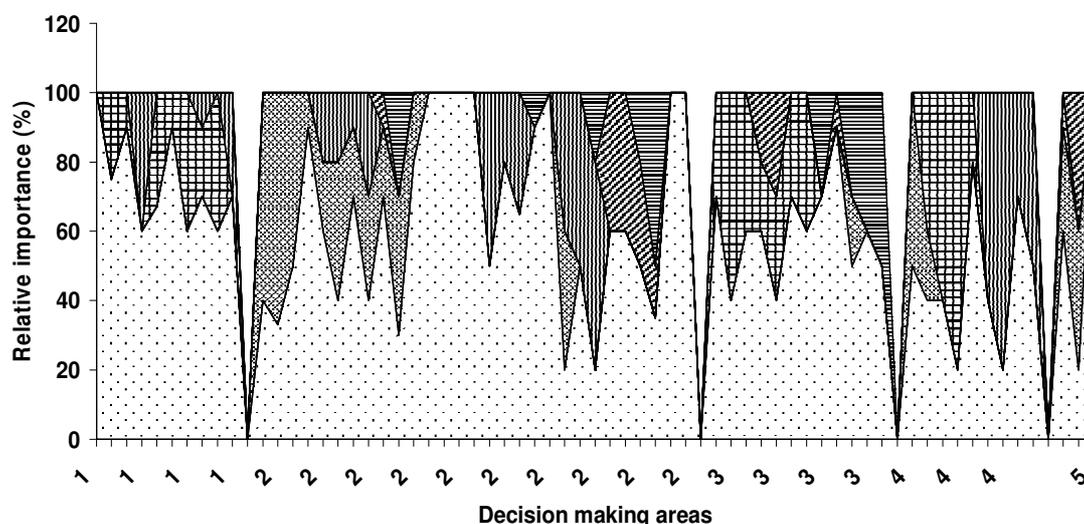


Figure 5: The perceived relative importance of a complex of decision making areas associated with the achievement of optimum profitability

Especially the perceived interaction between herd structure, financial aspects and marketing and client satisfaction is a clear indication of the awareness amongst commercial springbuck ranchers of the importance of a clearly defined market (client) orientated production plan.

These perceived interactions, when evaluated across the research population, suggest a matrix of influences covering all the different macro groupings, making this the perceived most complex set of decision making areas influencing the optimum achievement of profitability.

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

With regard to *sustainability* (Figure 6) herd management factors (read: herd structure) and production environmental decision making areas are deemed 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 equivalent influences and factors.

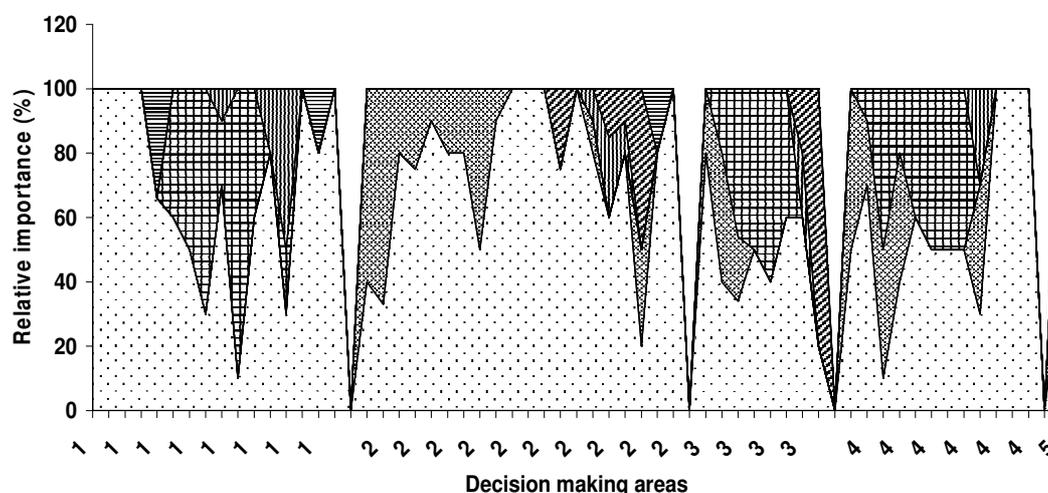


Figure 6: The perceived relative importance of a complex of decision making areas associated with the achievement of optimum sustainability

Herd management is consistently perceived to be a very prominent decision making area with regard to the achievement of perceived optimum *sustainability*.

9. CONCLUSIONS

The changes in the matrices of perceived associated decision making areas relating to the different measures and facets of efficiency are quite notable. 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 the 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.

By the same token it can be argued that a major need for research and information generation and distribution (extension) concerning the effects of herd structure and management on commercial springbuck production exists. The relative complexity of the decision making processes associated with commercial springbuck production systems and the information needs of such decisions call for the definite 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.

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