COMMERCIAL GAME UTILIZATION ON SOUTH AFRICAN FARMS

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ABSTRACT

A mail survey was conducted to examine game utilization. Forty nine per cent of respondents derive income from game, but this income tends to be small relative to total farm income. Concerns involved with trophy hunting obtain more revenue than other categories, they keep more species and devote more time to game farming. Almost 50 per cent plan to expand game farm activities. Stock farming represents the main activity on farms of most respondents.

1. INTRODUCTION: A SURVEY OF GAME FARMING

Little is known regarding utilization of game on South African farms. In 1984 a mail questionnaire survey was conducted in order to gain insights. Mail surveys enable researchers to reach a large number of respondents at a relatively low cost (Oppenheim, 1966) but the possibility of a low or biased response is a distinct disadvantage. Bias results when sections of a population are over or under represented. In large surveys, responses of between 20 and 70 per cent (Goode & Hatt, 1952) and between 40 and 60 per cent (Oppenheim, 1966) have been mentioned as common, whereas Backeberg (1984) obtained a response of 84 per cent in a study on irrigation farming in the Great Fish River. A low response can seriously affect validity of results.

Various means of prior communication were used in an effort to promote response. This communication included radio talks, a television interview and press releases. Respondents could also win tickets for a rugby test match. The survey was conducted by the Directorate of Agricultural Production Economics and the Departments of Zoology and Agricultural Economics at the University of Pretoria.

Names and addresses of 2207 farmers who stock game were obtained, and a questionnaire was mailed to each. A total response of 1529 replies was obtained, representing 69 per cent. Of these 752 farmers indicated that they obtain a financial income from game. These 752 farmers' results were subsequently analyzed. Benson (1988) gives a more detailed breakdown of responses.

Frequency breakdowns of data of these 752 farmers were computed on the IBM Persetel PS 7/83 computer of the University of Pretoria. Of the 752 cases studied, 23 per cent were from Transvaal, 13 per cent from the Orange Free State, 7 per cent from Natal and 57 per cent from the Cape Province, Ciskei and Transkei.

Some questions in the questionnaire required respondents to indicate their preferences. Only the first choice was further analyzed.

2. FINDINGS OF THE STUDY

The findings of the study are represented in this section.

2.1 Importance of game as a source of revenue

The contribution of game to gross farm income is analysed in Table 1. In the great majority of cases, game farming makes a rather modest contribution, with 81 per cent of respondents deriving 10% or less of their gross income therefrom. Only 6,6% derive over half of their gross income from game, with very few specializing in game farming.

Seventy three per cent of respondents regard their farms mainly as beef or sheep farms; 90% of respondents obtain income from cattle. Few of the farms are predominantly used for crop production. Fifty two percent of respondents indicated a larger interest in the aesthetic value of wildlife than in its profit potentialities.

The following categories, based largely on Berry's classification (1986), were mentioned as the main sources of revenue from game:

Venison	: 36,0% of farmers
Biltong hunters	: 29,0%
Live game sales	: 13,2%
Trophy hunters	: 12,0%
Game viewing	: 8,8%
Camping	: 1,0%

Table 1: Contribution of game to gross farm income

Percentage contribution to gross farm income	Frequency	Percentage	Cumulative Percentage
1 - 5	512	68,1	68,1
6 - 10	97	12,9	81,0
11 - 15	30	4,0	85,0
16 - 20	21	2,8	87,8
21 - 30	15	1,9	89,7
31 - 40	19	2,6	92,3
41 - 50	8	1,1	93,4
51 - 90	26	3,4	96,8
100	24	3,2	100,0

Respondents were asked a question pertaining to future plans. Forty six per cent indicated a desire to expand game farming activities while 45% plan to persevere with the present level, 4% plan to reduce it and 5% were uncertain.

If it is borne in mind that 81% of respondents (all of them already in game farming) derived 10% or less of their gross income from game, then a desire of 46% to expand game farming (without the planned expansion being quantified), does not seem to indicate large expansions in the foreseeable future. It is unlikely that large numbers of farmers will in the foreseeable future become predominantly game farmers.

2.2 Physical farm organization

Respondents' properties are dispersed geographically and occur in a variety of farming regions. A wide diversity of farm sizes could thus be expected. The wide geographical dispersion precludes meaningful analysis of farm size. It may, however, be mentioned that 11,2% of the properties are smaller than 200ha while 4,1% exceed 9000ha. A division into quartiles yields the following:

First quartile : 447 hectares
Median : 1100 hectares
Third quartile : 2866 hectares

The arithmetic mean is 2545 hectares and farms of 74% of respondents are smaller than the mean.

Fifty per cent of respondents reported five or fewer species of game on their farms and approximately 45% reported between 6 and 20 species. Since respondents evidently interpreted the question regarding species in different ways with some including and others excluding predators and some bird species, no further analysis of speciel numbers was made.

Eighty one per cent of the properties were fully fenced; game entered and left farms freely in 6% of cases, and 13% had their farms partially fenced. Two thirds of respondents graze game and livestock together in the same camps. The farms of approximately half of the respondents have been exempted from nature conservation ordinance requirements, thus allowing them to hunt or crop game at any time of the year.

2.3 Hunting

Table 2 gives an analysis of numbers of hunters received by respondents.

Table 2: Numbers of hunters hosted per farm over three years

Number of hunters	1982		1983		1984	
	Freq	%	Freq	%	Freq	%
0	266	35,4	299	30,4	206	27,4
1- 5	155	20,6	174	23,2	169	22,5
6-10	144	19,1	140	18,6	159	21,1
11-15	67	8,9	66	8,8	58	7,7
16-20	41	5,5	50	6,7	52	6,9
> 20	79	10,5	93	12,3	108	14,4

In 1984, 27% of respondents did not receive any hunters, while 79% hosted 15 or fewer hunters. Half of the respondents hosted 5 or fewer hunters. The percentage farmers hosting 20 hunters or fewer declined between 1982 and 1984 and those receiving over 20 increased from 10,5 to 14,4% (Table 3). Over three years the arithmetic mean of hunters increased from 15,9 to 21,3 to 27,7. This amounts to an increase of 32% per annum respectively, indicating a considerable increase. The median for the three years (1982-1984) was respectively 3,6; 4,2 and 5,0. The distribution is rather skew, indicating that a minority tend to have the major share of the hunting business. Table 3 contains a frequency distribution of the number of hunters which can be accommodated at a time. The arithmetic mean is 4,5 and the median 3,0. Sixty nine per cent cannot host more that 5 hunters at a time, while close to one per cent can host over 20. Approximately 5% of respondents own 24% of the capacity, and approximately 31% own 71%. This concentration is in accordance with the phenomenon that a minority of farmers derive substantial revenues from game. Additions to facilities will in most cases require capital outlays, increased staff and more managerial attention.

Table 3. Number of hunters which can be hosted at a time

Number of hunters	Frequency	Percentage	Cumulative Percentage
0	161	21,4	21,4
1 - 5	356	47,4	68,8
6 - 10	196	26,1	94,9
11 - 20	32	4,3	99,2
21 - 56	7	0,8	100,0

Seventy six per cent of respondents accommodate hunters for three or fewer days at a time, and hunting trips of one week or longer is the exception rather than the rule (Table 4).

Table 4. Average number of days per hunting trip

Days	Frequency	Percentage	Cumulative percentage
1	190	37,9	37,9
2 - 3	192	38,3	76,2
4 - 5	67	13,4	89,6
6 - 7	24	4,8	94,4
8 - 30	28	5,6	100,0

Hosting hunters for sustained periods will probably require inputs in accommodation and entertainment which are beyond the reach or interest of most respondents. This is largely the domain of professionals who receive trophy hunters, mostly from the U.S.A. and Europe.

2.4 The farm operator

Twenty per cent of respondents have been farming game for fewer than 6 years and 15% for over 25 years. One third earn revenues in occupations other than agriculture. The average age of respondents is 48 years. An analysis was made of the percentage of respondents' working time devoted to game farming. Data appear in table 5.

Table 5: Percentage of working time devoted to game farming activities

Percentage time	Frequency	Percentage	Cumulative percentage
0 - 1	278	36,9	36,9
2 - 5	238	31,6	68,5
6 - 10	21	13,4	81,9
12 - 20	33	5,7	87,6
11 - 30	38	5,1	92,7
33 -100	54	7,3	100,0

It appears that 37% devote one percent or less to game farming and another 32% between two and five percent. Two percent are full-time game farmers. Percentage of time has been shown to be the most important predictor of percentage of gross farm income derived from game. Automatic interaction detection analysis yielded a reasonably monotone increasing relationship between these two variables (Behr *et al*, 1989). This at least dispels an apparent popular public perception that game farming can yield revenues without sustained managerial attention.

2.5 Categories of game utilization

Respondents were classified according to the category of game utilization which in their opinion contributed most to profit. Information of 34 respondents is lacking. The format of data rendered it advisable to use a somewhat other classification than the classification used by Berry (1986), which was mentioned earlier. Respondents are indifferent to the question whether local hunters prefer biltong to venison. Averages presented in tables 6 and 7 include only those respondents responding to a particular question. In table 7, for example, 208 respondents are included in the category " hunting to obtain venison," but only 203 provided replies to questions pertaining to fencing.

The majority of respondents' (56%) farms are in the Cape Province, and those of another 24% in Transvaal. Natal and the O.F.S. yielded 20% of respondents. It is interesting to compare these percentages to provincial percentages of all farms in the Republic. By 1986 the Cape Province contained 39% of all farms compared to 34% in Transvaal while Natal and the O.F.S. contained 10% and 18% respectively (1989 Abstract of agricultural statistics). Although biased response is quite possible in this survey, it does give the impression that farms in the Cape Province are more likely to be used at least partially for game than in the other provinces.

Table 6: Numbers of respondents according to category of game utilization.

Category	Transvaal	Natal	Cape	OFS	Total
Hunt to obtain venison	56(27)* (33)	20(10) (39)	108(52) (27)	24(11) (25)	208 (29)
Trophy hunting	36(42) (21)	9(10) (17)	38(45) (9)	3 (3) (3)	86 (12)
Venison production	35(14) (21)	10 (4) (19)	162(62) (40)	52(20) (55)	259 (36)
Game viewing	11(17) (7)	7(11) (13)	39(62) (10)	6(10) (6)	63 (9)
Camping	2(29) (1)	4(57) (8)	1(14) (-)	0 (0) (0)	7 (1)
Live sales	28(29) (17)	2(2) (4)	55(58) (14)	10(11) (11)	95 (13)
Total	168(24)	52(7)	403(56)	95(13)	718

* Province as percentage of total in category
** Category as percentage of province

Venison production and hunting to obtain venison (including biltong) are the most important categories, constituting 65% of the total. Live sales and trophy hunting together constitute another 25%. Camping and game viewing which are in nature more reminiscent of tourism, play a relatively minor role.

Table 7: Details pertaining to different categories of game farm

Items	Hunting for venison	Trophy hunting	Venison production	Game viewing	Camping	Live sales
Numbers	208	86	259	63	7	95
Main form of land use	Stock farming	Stock farming	Stock farming	Stock farming	Wild life	Stock farming
Game fencing:						
Number	203	86	63	258	7	95
Fully fenced(%)	81	84	84	73	57	80
Not fenced (%)	6	6	6	10	14	2
Partially fenced(%)	13	10	10	17	29	18
Averages:						
Years farming	24	24	24	25	15	22
Years farming game	14	13	17	16	8	13
Income:						
Total farm(R'000)	151	205	146	12	243	258
% from game	13	27	7	14	2	1
From game (R'000)	11	43	7	0.4	35	14
% time devoted to game	11	25	5	13	30	13
Farm size (ha)	2360	3513	2585	1805	2826	2435
Number of Species	7	14	5	8	10	9
Future plans:						
Number	207	86	256	62	7	7
Expand (%)	45	67	32	52	86	51
Same (%)	48	28	55	45	14	42
Reduce (%)	3	3	7	-	-	-
Uncertain (%)	4	2	6	3	-	7
Average:						
Number of hunters:						
1982	18	23	11	9	21	11
1983	21	21	11	9	15	11
1984	22	23	13	10	13	11
Hunters at given time	6	5	6	4	6	5
Hunting days	2	5	3	3	3	3
Profession outside agriculture (%)	29	29	26	37	71	38

* This figure represents a direct summation and division of respondents percentages and will not tally with mean income from game expressed as a percentage of mean farm income.

Transvaal and Natal game farmers seem to be more interested in hunting ventures than those in the Cape Province and O.F.S. More than 50% of respondents in the former two provinces participate in these categories (venison and trophy), compared to 36% in the Cape Province and 28% in the O.F.S. This is probably related both to climate, vegetation and dominant game species in the various provinces. Live sales appear to be less important in Natal than the other provinces. Venison production appears to be more popular in the Cape Province and O.F.S. This may possibly be ascribed both to terrain and vegetation, which probably render game cropping to be physically more feasible on large parts of these two provinces than in Transvaal and Natal.

In Table 7, data on certain organizational aspects are shown. Although a division has been made according to province (Behr, 1988) only country-wide data are presented in this article, since provincial comparisons did not yield large difference within this framework.

Stock farming which has previously been mentioned as the main activity of the sample in total, appears to maintain this position in all categories with the exception of camping, which mainly presents wildlife orientated concerns. Game farming contributes on the average more (27%) to farm income in the case of trophy hunting enterprises, possibly indicating a larger degree of specialization in game. Its contribution is more modest in the other groups ranging from 1% (live sales) to 14% (viewing). Those involved in camping have on the average been in the business for shorter time, than the other groups, whose averages exceed 20 years.

Enterprises catering for trophy hunters have also earned the highest average income from game (R43 000) with camping (R34 850) the second highest. This relatively high average (R34 850) cannot, however, be regarded as representative. One respondent earned R177 600, while the average of the remaining six amounted to R16 588. Average revenue contribution in the other categories ranged between R4 222 and R14 300.

Respondents involved with trophy hunting and camping also devoted higher percentages of their working time to the game enterprises. This is in accordance with the observation that more managerial time inputs are associated with higher income contributions. On average they kept more game species than encountered on farms in other categories. The average size of farms involved with trophy hunting was also larger (3 513 ha) than those in other categories. The averages in other categories varied between 2 360 and 2 826 hectares.

Six of the seven respondents involved with camping planned to expand their game activities with the remaining one satisfied with the *status quo*. Two thirds of the trophy hunting operators planned to expand game activities. A much more modest percentage (32%) of those involved in venison production were planning to expand game farming activities. This may possibly be ascribed to problems in the marketing of venison and also to technical problems involved with game cropping (Behr, 1988). In the other categories the percentages planning expansion varied between 45 and 52.

The respondents involved with hunting to obtain venison and trophy hunting have hosted approximately 20 hunters per respondent per year, compared to approximately 11 per respondent per year for those whose game farming is largely concerned with venison production, game viewing and live sales.

Five of the seven involved with camping were involved with professions outside agriculture. The corresponding percentages in other categories varied between 26 and 38.

3. CONCLUSION

Results of this survey indicate that South African game farming has not and is unlikely to develop into a major agricultural concern. Very few farmers have indeed specialized in this venture. This does not automatically indicate indifference regarding

wildlife. Of 1 529 farmers who indicated that they did have game on their farms, a relatively small portion (752 = 49,2%) derived income therefrom. Most landowners who keep game regard their properties first and foremost as stock farms. It is noteworthy that among those deriving some income from game, almost half planned to expand their game farming activities.

There are, however, considerable marketing problems. Retail marketing of venison is badly organized (Behr en Groenewald, 1989). Exports seem at this stage to be handled by only two firms. Between 1984 and 1986, an average of 851 tons was certified by the Directorate of Veterinary services for export. Actual quantities exported are however unknown (Behr, 1988). The existence of a duopsonistic structure can hardly be expected to add to marketing incentives.

Game farming can develop into a major concern only if it becomes financially attractive to a large number of farmers. In order to achieve this, more attention will have to be given to market development of its products, such as meat, hides, etc., and associated services such as tourism and recreation.

4. NOTES

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