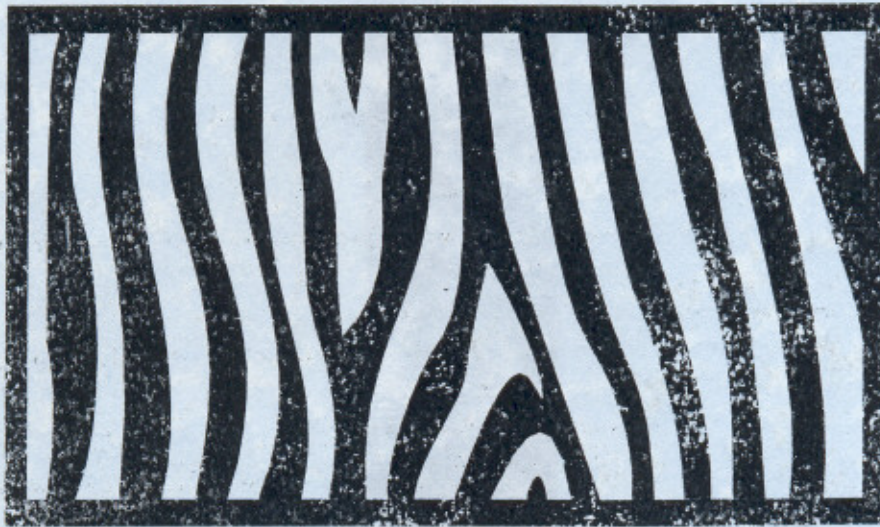


Laikipia Wildlife Economics Study  
Discussion Paper CEC-DP-2

*Increasing Landowner Earnings from Wildlife Cropping  
In Laikipia, Kenya*



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A F R I C A N  
W I L D L I F E  
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Conservation, Economics and Commerce Program

## ***Summary of Main Findings***

Despite its thirty-year history in Kenya, the commercial wildlife cropping industry is highly fragmented and experimental. Because of the effective ban on widespread utilization from 1977-1990 and the tight regulatory framework that is in place, the market is small, but growing rapidly. Since the KWS pilot utilization program began in 1990 the legal market for game meat for human consumption has grown at an estimated 35% p.a. to 250 tons p.a. in 1997, with a wholesale value of \$450,000. The legal market appears to be linked closely with the informal "bush meat" market in Kenya, which is believed to be hundreds of times larger than the legal market. The competition in supplying game meat has increased since 1990 and real prices have fallen significantly.

Landowner earnings from cropping have been low, estimated at \$0.20-0.40 per hectare p.a. in Laikipia in 1996. Landowners receive only 5% of the value added from the main cropping products – meat and skins. The quality of skins produced to date has typically been low, reflecting the fact that cropping, skinning, salting and storing expertise is still being developed. Laikipia appears to be at a disadvantage from other districts because of the higher transport costs to major markets and because of its single-species focus. Laikipia produces about 230 tons of game meat p.a. from its cropping program, but less than 25% of this is currently sold directly into the high value Nairobi and Mombasa markets. 84% of Laikipia's production is zebra meat, which finds a growing market as a substitute for beef in animal feed products. Zebra meat prices are lower than those for any other game species.

Abattoir-wholesalers on the other hand were making attractive rates of return until the collapse in the demand for high value meat in the second half of 1997. However there are real and significant barriers to entry for landowners to become abattoir-wholesalers, including significant investment costs, a minimum economic scale of 400 animals p.a. and the need for both an established distribution network and excellent buyer relationships.

Landowner earnings from wildlife cropping could be increased by deregulating the cropping industry to allow a greater range of value added activities in Kenya. Alternative strategies include vertical integration (e.g. joint abattoir ownership), re-negotiation of abattoir animal purchase prices, the payment of "grass rents" to landowners who protect wildlife but receive no economic benefit, or the development of an economic small-scale approach to processing value-added products.

## ***Acknowledgements***

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## ***1. Introduction***

From the Presidential Decree in 1977, that banned hunting and effectively stopped consumptive utilization of wildlife in Kenya, until 1990 only a handful of ranches were permitted to crop wildlife. In 1990 the Kenya Wildlife Service (KWS) introduced a limited pilot wildlife utilization program across Laikipia, Kajiado, Nakuru, Meru, Samburu and Machakos Districts. By 1996, 54 ranches in these districts had been authorized to crop wildlife within agreed quotas, and 66 game farms had been licensed to rear ostrich, guinea fowl, crocodiles, frogs, quails or butterflies (Game Ranching Ltd., 1995). In Laikipia wildlife cropping is now licensed on 30 individual ranches and 11 community landholdings (Wafula, 1997). This paper focuses on landowner earnings from wildlife cropping in Laikipia.

Landowners have welcomed cropping for three reasons. The transfer of property rights from KWS to the landowner, though as yet very limited, is seen as a step in the right direction in that it gives landowners some say in the use of wildlife on their land. It increases the opportunities for adjusting livestock and wildlife populations e.g. as a means of managing the demand for fodder and water. Finally, it was hoped that cropping would yield direct commercial returns from the sale of meat and skins.

Laikipia District in Kenya has a wealth of wildlife resources. Laikipia's wildlife is currently being protected by private landowners – both community and individual – for aesthetic and economic reasons. Despite the fact that the new policy has not allowed for hunting or trade in live animals, it has dramatically altered landowner perceptions of wildlife (Heath 1996a and 1996b). For example, West Laikipia Farmers, incorporating Ol Morani and Sipili, now employ their own game scouts and are in the process of buying out absentee landowners and creating a conservation area on sub-divided land that is unsuitable for agriculture (Heath 1996a).

Wildlife cropping in Laikipia is currently being pursued as an incremental livelihood strategy to livestock ranching. In the first Discussion Paper of this series, titled "Making Wildlife Pay in Laikipia, Kenya", we showed that wildlife cropping has to date generated very low returns to landowners, estimated at \$0.20-0.40/ha p.a. (Elliott and Mwangi, 1997). Furthermore Laikipia landowners currently retain less than 5% of the final value of wildlife products. We concluded that, without a significant change in the current framework of economic incentives, the trend will be for wildlife to be removed from all land in Laikipia except that supporting successful wildlife tourism ventures or where the landowner has non-economic reasons for conserving wildlife. In this second Discussion Paper we explore the reasons for the low returns to wildlife cropping and the scope for increasing these returns.

## ***2. Wildlife Cropping in Laikipia***

Wildlife cropping rates have been well below quota in Laikipia. In 1996 no species except giraffe was cropped to more than 50% of the quota agreed with KWS. Table 1 gives actual cropping rates for the eight species cropped in 1996.

**Table 1: 1996 Laikipia Wildlife Cropping Rates**

	Buffalo	Eland	Giraffe	Impala	Grant's	Thom- son's	Water Buck	Zebra
<i>September 1996 count</i>	1,915	3,393	1,647	6,590	4,055	4,471	571	33,378
<i>1996 cropping quota</i>	248	260	85	542	69	399	81	3,222
<i>(Quota as % of count)</i>	(13%)	(8%)	(5%)	(8%)	(2%)	(9%)	(14%)	(10%)
<i>1996 actual number cropped</i>	19	9	73	62	2	81	25	1,395
<i>(Cropped as % of quota)</i>	(8%)	(3%)	(86%)	(11%)	(3%)	(20%)	(31%)	(43%)

Source: Laikipia Wildlife Forum

*Cropping rates in Laikipia have been low for two main reasons:*

**A. Some landowners choose not to use their quotas**

One reason for the low cropping rates is that many landowners choose not to crop for their own reasons. As the quotas are fixed to land units and not tradable an unused quota is currently worthless.

**B. Where landowners are using their quotas, current rates of return from cropping are very low.**

Earnings from cropping in Laikipia have been low, and are considerably lower than those from livestock ranching or wildlife tourism, where these are feasible alternative land uses. The first paper in this series estimated wildlife cropping earnings in Laikipia to be in the region of \$0.20-0.40 per hectare p.a. for the period 1995-1996 (Elliott and Mwangi, 1997). Comparative figures from other studies show similar results. For example cropping earnings for one ranch in Machakos in 1995 were reported to be \$0.58 per hectare for wildlife cropped on the ranch and \$0.26/ha for wildlife cropped on other ranches (Bos et al, 1996). In Kajiado, Rainey reports current cropping earnings of \$0.68/ha (Rainey, at Machakos Wildlife Forum meeting, December 1997). Thus, commercial returns to landowners from wildlife cropping have been disappointing.

*These low returns are due to three main factors:*

1. **Restrictive regulatory environment - KWS tries to maintain effective control over the processing, marketing and sale of wildlife products** because of concerns about possible over-consumption and illegal harvesting. Kenya's highly restrictive regulatory environment constrains landowner ability to add value to wildlife products. For example, in addition to the ongoing ban on hunting, present KWS policy does not allow trade in skins with hair on within Kenya, sale of game meat to unlicensed butcheries, or advertising campaigns for game meat. Special licenses are required to export skins, meat and skulls/skeletons, and these can take considerable time to acquire.

2. ***Growing competition in a small but growing market.*** Since 1990 the legal market for game meat in Kenya has grown rapidly in volume, though average prices have fallen significantly in real terms (Sommerlatte & Hopcraft, 1993). Whereas one rancher/wholesaler dominated the market until 1993, a number of new competitors have come in as the market has grown and the number of landowners supplying wildlife has increased. We estimate that the wholesale game meat market is now worth about \$450,000 p.a., representing a volume of about 250 tons p.a. Apart from the regulatory environment, the key factors driving the market for game meat include consumer tastes (many Kenyans, for example, do not eat zebra meat) and proximity to final markets (transport, storage and refrigeration costs). Furthermore there are signs that game meat is increasingly able to compete with beef for human consumption in the bulk of the domestic meat market. To date Laikipia has harvested mainly zebra. Zebra meat is usually sold direct to wholesalers for human or animal consumption. Prices have generally been lower for zebra than for other species and lower in Laikipia than Machakos.
3. ***Less than 5% of value added from wildlife products currently accrues to landowners who face significant barriers to entry into value added activities.*** The barriers to entry include legislative, economic and skills barriers. Cropping is a highly skilled activity, particularly when high quality skins are required. An estimated 50% of Laikipia's zebra skins produced to date have been rejected by buyers because of poor quality skinning, salting and storage. The processing and value added activities that are allowed tend to be concentrated in the hands of wealthier landowners who are able to fund the capital investment required and access the skills and management expertise needed for success. For example, value added to game products during the abattoir process is significant, but it costs up to \$70,000 to build an abattoir from scratch. A landowner that sells his game direct to an abattoir is likely to receive less than \$70 per zebra, compared with the \$300 per head that he receives for his beef cattle. Yet the total value of the end products may be higher for game than cattle.

These factors are explored in more detail in sections 3, 4 and 5 of this paper.

### ***3. The Regulatory Environment***

All of Kenya's wildlife is owned by the state. Current restrictions on wildlife utilization in Kenya include:

- No hunting.
- Wildlife cropping allowed only on approved ranches and within agreed quotas.
- No processing of skins with hair on within Kenya, though export of whole, unprocessed skins permitted.
- No marketing or advertising of wildlife cropping products.

Other constraints to the development of the wildlife cropping industry within the regulatory environment include the:

- ***Lengthy process of setting quotas annually.*** KWS is now considering changing process to one where quotas are agreed and set, changing only when monitoring program indicates that change is needed.
- ***Lengthy process for getting licenses*** for export of skins and bones compared with competing suppliers.

The time lag constraints should and can be tackled immediately with commitment from both landowners and KWS. In Laikipia LWF has proved to be an effective mechanism for coordinating the cropping program and for liaison with KWS. However, it appears that in some parts of Kenya it is not always clear who has and does not have licenses to crop, buy and sell game products.

There are signs that KWS is ready to begin the process of relaxing some of the regulatory constraints, recognizing the need to increase the economic opportunities offered to landowners from wildlife management. The new wildlife legislation proposed for enactment in the next session of Parliament will establish the basis for KWS to expand the utilization program. Alternatively, this could also be done before the enactment of new legislation by repealing specific amendments to existing legislation.

There is a vitally important role to be played in the process of regulatory reform by the local, district and national wildlife associations and landowner forums. It is estimated that over 150,000 landowners in Kenya are now members of a wildlife association or forum. The strengthening of these groups to enable them to monitor, manage and market wildlife products on behalf of their members and as part of a national KWS program is vital. As the industry is deregulated, industry members will be expected to take on some of the responsibilities that to date have been shouldered by KWS including monitoring, discipline and control. While some of the more experienced forums, such as the Laikipia and Machakos Wildlife Forums, are already able to do this for their members, they are the exceptions rather than the rule.

There is a clear need to learn from the experiences of the utilization program and its stakeholders to date, by assessing and disseminating what has and has not worked across the spectrum of landowners involved in the pilot utilization program.

#### ***4. The Demand for Wildlife Cropping Products***

##### ***Game meat market size and growth***

From Table 1 and the figures for average dressed weight per animal for each species in Bos et al, we estimate that Laikipia produced 230T of legally harvested game meat in 1996, of which 84% was from zebra. Of this we estimate that less than 25% was sold into Kenya's high value human consumption markets (see Table 2). The bulk of Laikipia's production was sold cheaply for local human consumption or for dog food, or was consumed on the producing ranches.

The legal, high-value (human consumption) market for game meat in Kenya is centered on Nairobi and Mombasa. Table 2 indicates the strong rate of growth of the national market in the 1990s, from an estimated 35T p.a. in 1990 (Sommerlatte and Hopcraft, 1993) to 230T p.a. in 1995 and 250 tons in 1997 (AWF estimate based on interviews with market players).

**Table 2: Estimated Size of Game Meat Market for Human Consumption in Kenya**

	Volume Game Meat Sold Legally in Nairobi & Mombasa		Annual Compound Growth Rate (in volume sold p.a.)	
	Leading Wholesaler	Total Market		
1990	29 tons	35 tons		
1995	110 tons	230 tons	1990-1995	30-45% p.a.
1997	119 tons	250 tons	1995-1997	5% p.a.

Source: Interviews, and Sommerlatte & Hopcraft, 1993

There has also been a rapid growth in the use of zebra as a beef substitute in animal feeds, particularly dog-food. This is a relatively low-value segment but appears to be growing fairly fast. Some of the key buyers in this segment are organizations that keep security dogs, e.g. the police and the commercial security companies. This market is thought to account for at least a further 100 tons of cropped game meat a year.

#### *Factors driving market growth*

The main factors driving the rapid growth in this market over the past seven years have been the:

- Rapid growth in the number of ranchers participating in cropping after 1990.
- Growing number and professionalism of game meat croppers, abattoirs and butchers.
- Growing number of wholesalers able to develop the retail markets in Nairobi and Mombasa.
- Growing acceptability of game meat and wider variety of game species to tourists, Kenyans and chefs.
- Growing tourism numbers (excluding the second half of 1997).

The high value market for game meat, like that for beef, has been badly affected by the major decline in the tourism industry in Kenya in the second half of 1997. Only those abattoirs and wholesalers with captive markets and/or excellent linkages with retailers have been able to maintain cash flow streams.

#### *The "bush meat" market in Kenya*

This paper is concerned specifically with the market for wildlife products arising from the wildlife cropping program in Laikipia. However, it is clear that the legal game product markets in Kenya are closely linked with the informal/illegal bush meat market and subsistence consumption. TRAFFIC East/Southern Africa is currently conducting a survey of bush meat consumption in Kenya, focusing on bush meat supply from Kitui & Meru and Samburu, the bush meat market in Nairobi (with a focus on Kibera) and Mombasa and along the Nairobi-Mombasa highway, and supply from Kajiado and Machakos. The TRAFFIC study is expected to be

completed in July 1998 and will provide important insights into the structure of both formal and informal/illegal game meat consumption in Kenya.

### *Prices and market value*

From interviews with wholesalers we estimate that the 1997 market of 250 tons is worth about \$450,000 in wholesale terms, or about \$1,800 per ton. Between 50-65% of the market is for tourists and the market therefore has a strongly seasonal pattern, peaking in March-April, July-August and November-December. Overall an estimated 70% of the market is in Nairobi and 20% in Mombasa. About 10% of game meat produced are consumed on the producing ranches.

Prices for game meat have fallen in real terms. The average price of venison fell from 245 Kshs/kg (\$4.08/kg) in 1987 to 82 Ksh/kg (\$1.37/kg) in 1994 (Bos et al, 1996). Machakos game meat has been wholesaling at an average 108 Ksh/kg (\$1.80/kg) in 1996-97. Zebra meat, however, is currently fetching only 35 Ksh/kg (\$0.58/kg) in Laikipia and 45 Ksh/kg (\$0.75/kg) in Machakos.

Price differentiation is increasing between market segments. The high value human consumption segments is very sensitive to quality and reliability of supply, and is still willing to pay a premium for venison over beef. The low value animal food segment is highly price sensitive. Zebra is taking an increasing share of this market away from beef because it is cheaper.

Prices vary considerably between species and geographically. Table 3 indicates the variation of wholesale prices and value added between game species and compares these with those for cattle in 1995. Figure 1 plots dressed weight per animal against wholesale price per kg for different game species and cattle in 1995. Larger animals tend to have a lower value per kg because their meat is less highly valued than the venison cuts from the small gazelles and antelopes. From interviews with wholesalers, the prices for eland, giraffe, oryx and ostrich seem set to maintain a premium, albeit a declining one, over beef, reflecting consumer perceptions of these meats and/or their availability. The prices for zebra, hartebeest and wildebeest now appear to move in line with beef prices.

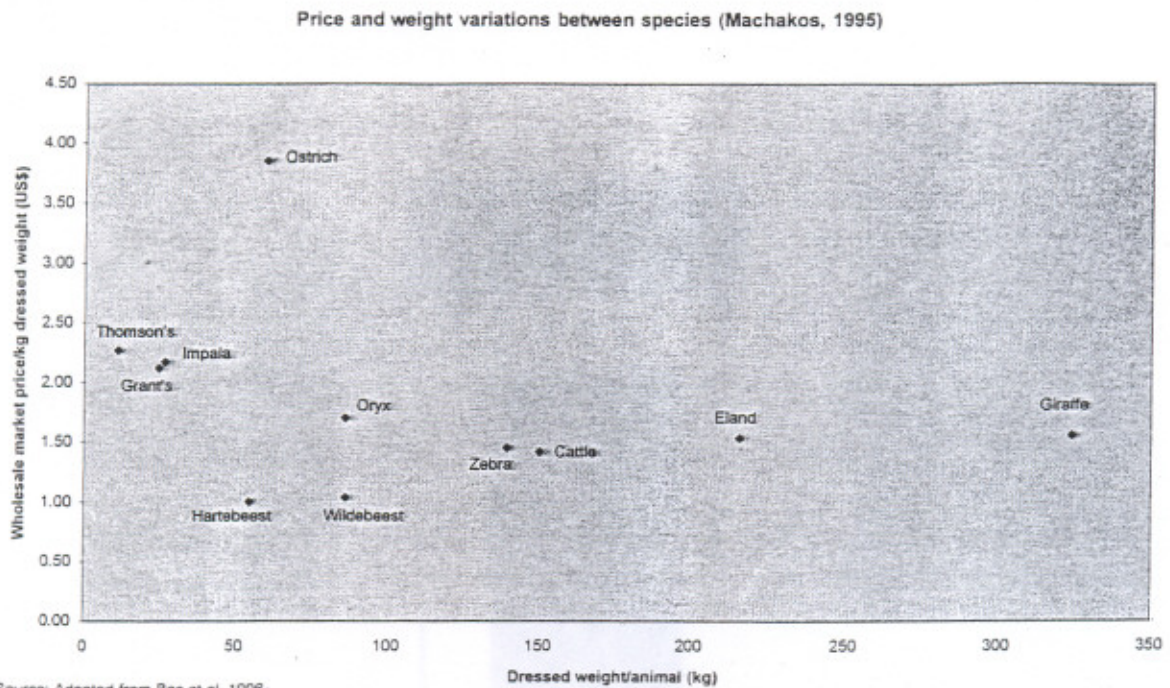
**Table 3: Game Meat Prices and Value Added Per Animal – Machakos, 1995**

	Cattle	Eland	Giraffe	Impala	Grants	Tommy	Zebra
<i>Average price/ kg</i>	\$1.42	\$1.53	\$1.55	\$2.17	\$2.12	\$2.27	\$1.45
<i>Value added/kg</i>	\$0.50	\$0.78	\$0.80	\$1.13	\$1.07	\$1.03	\$0.97
<i>Value added/animal</i>	\$112	\$169	\$257	\$30	\$26	\$12	\$133

Source: Adapted from Bos et al, 1996 (using \$1=60Ksh)



Figure 1



### *Price differences between Machakos and Laikipia*

The lowest game meat price for a leading Machakos based wholesaler in the period 1996-1997 was 55 Ksh/kg (\$0.92/kg). Whereas the maximum price realized by Laikipia wholesalers for zebra meat over the same period was 45 Ksh/kg (\$0.75/kg) and the average more like 35 Ksh/kg (\$0.58/kg). This difference in realized prices between these key cropping districts is explained by a number of factors:

- **transport costs** for bringing Laikipia game meat to Nairobi are significant, even without the use of refrigerated vehicles.
- Machakos game meat suppliers have *well-established linkages* with the game meat distribution and retailing network in Nairobi and Mombasa.
- **zebra** is one of the lowest value game species within the current utilization program and accounted for 84% of Laikipia production in 1996. While there are opportunities for increasing value added from zebra (e.g. by advertising and marketing products, by tanning and processing skin products, and/or encouraging local people to eat zebra), the bulk of the zebra meat market is likely to continue to trade at or below beef prices.

**Table 4: Estimated value of Laikipia's wildlife cropping industry**

Species	Total value of cropped animals (zebra = beef + skins)	Total value of cropped animals (zebra = dog food)
Buffalo	n.a.	n.a.
Eland	\$2,980	\$2,980
Giraffe	\$36,650	\$36,650
Impala	\$3,600	\$3,600
Grant's	\$100	\$100
Thompson's	\$2,030	\$2,030
Waterbuck	\$2,250	\$2,250
Zebra	\$351,540	\$112,995
<b>Total</b>	<b>\$399,150</b>	<b>\$160,605</b>

Source: adapted from LWF data, Bos et al, 1996

Using the cropping rates from Table 1, and average prices from Table 2, we estimate that Laikipia's cropping industry is currently worth between \$160,000-\$400,000. The higher figure assumes that wholesale zebra meat can fetch approximately the same price as wholesale beef and that zebra skins can be sold for an average \$50 each. The lower prices assumes that zebra meat is sold primarily as dog food (for about \$0.60/kg) and that zebra skins have no market value.

### **Processed Meat Products**

Within the pilot utilization program there has been little processing of game meat products. Box 1 illustrates some of the processing and marketing options being explored for cropping products in Kenya in the early 1970s.

#### **Box 1: Options for Increasing Wildlife Cropping Value Added in the 1970s**

**Size of Nairobi market:** for game hindquarters estimated at 4.5 tons per week, compared with a beef market of 800 tons per week, but very sensitive to failure to deliver and lack of chilling capacity for rent

**Export to Europe and US:** demand never tested by Kenyan producers, but thought to be significant

**Export to other African countries:** including a contract to supply 20-40 tons of fresh meat per month at a net premium to the Nairobi market, including chilling costs

**Canning:** as in Kruger where canned game meat is sold at park entrances, but only made sense in Kenya when at significant distance from higher value fresh meat market

**Meat and bone meal:** not economic given price control of meal

**Air-dried pet food meat:** as salvage use of meat not fit for human consumption, with extensive market for dog food at competitive prices

Source: Swank, Casebeer, Thresher & Woodford, 1974

Currently game meat wholesalers sell directly to hotels and restaurants, as well as to a few KWS-licensed butcheries. The only value added processing done by wholesalers is meat drying to produce biltong, some of which is then sold to retail outlets. Some ranches produce their own game sausages, but these are generally consumed on the ranches. One abattoir in Laikipia is experimenting with mincing and sausage making equipment, but to date has used it only for camel meat.

The processing of game meat products is still fairly experimental in Kenya. One important barrier facing a landowner or wholesaler thinking of entering this segment is the lack of information about market size and pricing opportunities. Another critical barrier to producing value-added products is the restriction on marketing and advertising. Farmers Choice, for example (the leading Kenyan pork meat processing, packaging and distribution company), with its own Laikipia game meat source, is well placed to develop and market value added products for game meat, such as sausages.

### **Skins**

In Laikipia zebra skins are a major potential income source in addition to game meat products. The Laikipia abattoirs have invested much time and energy in developing their skinning and salting skills. As tanning is not yet permitted for skins with hair on them, and no domestic sales are allowed, the only selling channel open to the abattoirs is export of whole, untanned zebra skins. A grade 1 skin can fetch up to \$100-200 depending on the wholesaler, whereas grade 2 skins fetch as little as \$50. Grade 3 skins are sometimes exported at very low value, or are sold locally, e.g. for shoe leather.

At present less than 20% of skins being produced in Laikipia are reaching grade 1 standards. Their shelf life is less than 5 years without tanning. With improved cropping, skinning and salting techniques this percentage could probably be increased to 30% or higher. The Laikipia Wildlife Forum is trying to help ranchers and abattoirs to increase the quality of zebra skins produced, thereby increasing earnings from wildlife cropping. Once the skins are tanned the risks of hair "slippage" are greatly reduced, so tanning would help increase the percentage of grade 1 skins as well as increasing the value added available locally.

**Table 5: Zebra skins exported from Kenya**

<b>Source of Exported Skins</b>	<b>1996</b>	<b>1997</b>
Laikipia (3 exporters)	1,834 (97%)	1,722 (95%)
Machakos (1 exporter)	0	54
Nakuru (2 exporters)	48	32
Personal	1	0
<i>Total</i>	<i>1,883</i>	<i>1,808</i>

Source: Compiled from KWS statistics

Tables 5 and 6 are compiled from KWS export license data and show the market share of exporters and importers of Kenyan zebra skins in 1996 and 1997. Laikipia is the main source of zebra skins for export from Kenya (Table 5). 80-90% of these skins are sold to South Africa and Zimbabwe (Table 6).

**Table 6: Countries importing zebra skins from Kenya**

Importing Country	1996	1997
Zimbabwe	1,190 (63%)	972 (54%)
South Africa	234 (16%)	667 (37%)
Namibia	150 (8%)	150 (8%)
Botswana	300 (16%)	0
USA	5	18 (1%)
France	3	0
England	1	0
Italy	0	1
<i>Total</i>	<i>1,883</i>	<i>1,808</i>

Source: Compiled from KWS statistics

The main buyers of Kenyan zebra skins are wholesalers from South Africa, Zimbabwe, Botswana and Namibia who go on to sell the skins for up to \$1,000 each (see Section 5 for an analysis of value added). Little information is publicly available as to the size and trend in demand for game skins and game skin products. Some traders indicate a decline in demand for zebra skins in some overseas markets e.g. Archer (1996) cites a "collapse in the use of zebra skins in the interior decorating sector in the United States". Yet South Africa and Zimbabwe based traders report buoyant demand for processed game skin products (with and without hair), including bags, shoes, wallets and chairs (pers.com.).

### **Skulls and bones**

The Kenyan market for other cropping products is very limited. Some bones, particularly skulls, are exported, usually with educational permits.

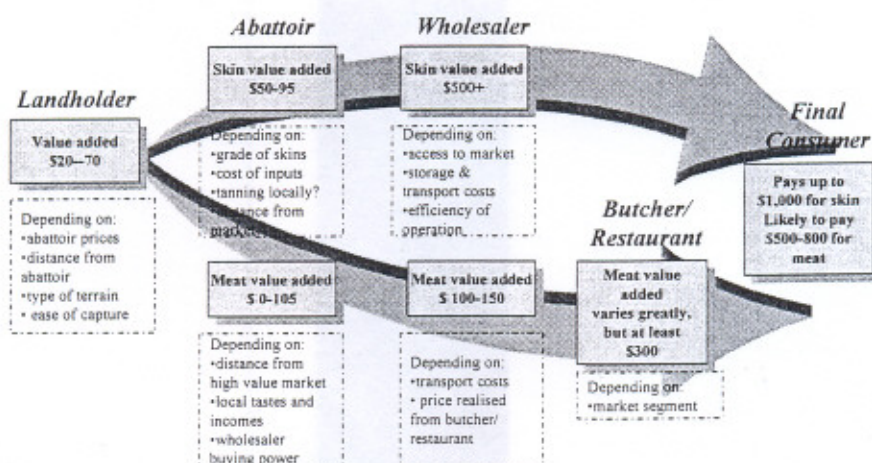
*We conclude that the market for game meat in Kenya is still small but has been growing rapidly. The market is an attractive one, as evidenced by the number of new entrants. The critical success factors for abattoir-wholesalers appear to be skilled labor (cropping, skinning, butchery), low transport costs (proximity to final markets), an established distribution network and good relationships with buyers (reliable volumes demanded, low risk of non-payment). The market for game meat, skins and other wildlife cropping products is heavily constrained by the restrictive regulatory environment that forces products into low value export channels. Lifting of these restrictions would lead to rapid market growth and product diversification (e.g. into processed meat and skin products).*

*The challenge to Laikipia landowners within the current regulatory framework is to build the local market for zebra meat, build zebra's share of the animal food market, establish a zebra-meat distribution network and to diversify into other species for which a high value market already exists. An additional challenge is to prepare for the likely deregulation of the market by*

developing the capacity and expertise for processing skin and meat products for local sale and export.

## 5. Supply side barriers

Figure 2: Currently most zebra value accrues to wholesalers and retailers



The supply side of Kenya's wildlife cropping industry remains fragmented and experimental. The key Kenya players along the value chain are the landowners, the professional croppers (of which there is only 1 operating in Laikipia who is not also an abattoir operator), the abattoir-wholesalers (of which there are three in Laikipia) and the retailers. In general little information is available about the recent commercial performance of existing and new players. Costs of production appear to differ significantly between areas and between units within areas. The regulatory constraints and unpredictable demand make this a fairly high-risk business. However, returns to early entrants into the abattoir-wholesale segment have been very attractive until this year.

Landowner earnings from wildlife cropping in Laikipia are very low. The value chain for zebra in Figure 2 shows that the typical Laikipia landowner captures less than 5% of each zebra's total market value. Most of the value accrues to wholesalers and retailers of the meat and skin products. There are several reasons why more landowners are not vertically integrated into cropping and processing of wildlife:

- **Cropping and processing is a skilled and specialized activity.** For example, the quality of a skin is very dependent on the selection and shooting skills of the cropper and the terrain in which the carcass falls. Once the carcass arrives at the abattoir it must be skinned and salted carefully.

- *The capital investment required is significant.* (see Table 7).
- *The fixed costs of abattoir operation* (salaries, some fuel, depreciation) mean that the *minimum economic scale* for a cropping and processing operation is larger than an average ranch, hence why most abattoirs service a number of ranches.
- *Running a successful wholesaling operation is a different type of business to running a ranch.* Successful wholesalers have established networks of buyers, strict payment arrangements and a sufficient scale of operation to cover fixed costs, including transport costs. These take time and expertise to build up. Experience wholesalers have therefore established significant barriers to entry for newcomers, unless the newcomers, like Farmers Choice, have their own distribution networks already established.

To date three wildlife abattoir-wholesale operations have been developed in Laikipia. Laikipia landowners make money out of cropping by selling live or dead animals to local abattoirs for cropping and/or processing and for this they receive a negotiated fee per animal – currently \$25-65 for a zebra in Laikipia. Typically an abattoir-wholesaler will make profits of \$50-100 per animal processed (see Table 8).

#### ***Capital Costs of an Abattoir***

In the emerging wildlife cropping industry in Kenya in the 1970s, various experiments were made with mobile cropping-abattoir units. One 1974 experiment proved to be economic within a 200km radius of Nairobi and a minimum throughput of 3 tons per week (Swank, Casebeer, Thresher & Woodford, 1974). It appears that some large scale ranches outside Laikipia still crop and process their wildlife using small-scale mobile units. However, the structure of the game meat market rewards wholesalers with reliable large volumes of fresh carcasses across a number of species, and observation of current abattoir sizes suggests that there is a minimum economic scale of production of about 400 carcasses a year.

One of the most significant barriers to entry to entry into the wholesale market is the capital cost and economies of scale associated with managing a cropping and processing operation. Table 7 is based on actual investment in an abattoir operation in Laikipia and indicates that capital of up to \$70,000 is required for a full cropping, skinning, meat processing and refrigerated storage operation. Some current operations in Kenya appear to cost significantly less than this, and actual capital required will vary considerably with location, scale of facility and standards for the facility.

#### ***Abattoir Operating Performance***

Table 8 analyses the actual operating performance of two wildlife abattoirs of similar size in 1996. The figures show that, coincidentally, the abattoirs both made an operating profit before tax of \$54 per animal in 1996. Operating margins (operating profit/gross revenue) were 47% and 31% respectively, and the rates of return on capital employed are estimated at 38%p.a. and 41%p.a. These figures suggest that one options for landowners to increase their earnings from cropping is to access some of the value added earned by wholesalers, either by entering directly into the wholesale market by vertical integration, or by renegotiating transfer prices between the ranch and the abattoir.

**Table 7: Indicative Capital Costs of a Wildlife Abattoir** (capacity - 40 carcasses per week)

	Capital Cost Ksh	Approx. Capital Cost US\$
Mitsubishi Canter	1,200,000	20,000
Tractor	560,000	9,333
Generator (cold room)	250,000	4,167
Equipment (basic)	65,000	1,083
Building	2,100,000	35,000
<b>TOTAL</b>	<b>Ksh 4,175,000</b>	<b>\$69,583</b>

Source: Interviews

**Table 8: Breakdown of operating costs for two wildlife abattoirs**

Abattoir Operating Performance	Abattoir A	Abattoir B
Number animals processed p.a.	540	488
Gross revenues	\$62,390	\$84,330
Operating profit	\$29,020	\$26,340
<b>Operating profit per animal</b>	<b>\$54</b>	<b>\$54</b>
<b>Operating profit as % revenues</b>	<b>47%</b>	<b>31%</b>
<b>Rate of return on capital employed of \$70,000</b>	<b>41% p.a.</b>	<b>38% p.a.</b>
<i>Breakdown of Operating Costs:</i>		
Cropping and purchasing costs	81%	50%
Salaries and wages	4%	17%
Vehicle operations and maintenance	6%	18%
Consumables and inspection	9%	15%
<b>TOTAL</b>	<b>100% of operating costs</b>	<b>100% of operating costs</b>

Source: interviews (note: no depreciation, financing costs included)

*We conclude that a successful abattoir/wholesaling operation can potentially increase wildlife cropping earnings for a ranch by an estimated \$30,000 p.a. Cropping over an economic area (about 80,000 hectares) would increase wildlife cropping earnings by about \$0.40/ha p.a. However the barriers to successful entry are high. A successful abattoir will have access to at least 400 cropped animals p.a. (equivalent to 25% of all animals cropped in Laikipia in 1996), as well as an established buyer network. Alternative strategies to increase value added would include joint abattoir ownership, re-negotiation of abattoir animal purchase prices, or the development of an economic small-scale approach to processing.*

*As an incremental livelihood strategy for landowners, wildlife-cropping returns are currently very low. There is scope for increasing landowner returns by encouraging landowners to share in some of the value added activities, particularly if some of the regulatory constraints are lifted. The experience of countries which currently practice hunting, and the experience of Kenya pre-1977, suggest that the returns to landowners from hunting are far higher than those from cropping. If the hunting ban were to be lifted it is likely that cropping will become a secondary wildlife activity for most landowners after wildlife tourism and/or hunting, or that the cropping industry would shrink significantly depending on the number of animals available for cropping.*

## **6. Conclusions - Scope for Increasing Cropping Earnings**

One of the most important conclusions from this study is the need for more systematic collection, analysis and dissemination of information about the economic and commercial performance of the Kenyan wildlife cropping industry. With the exception of the LWF cropping figures and some of the Machakos market information, the data in this paper has had to be compiled from scratch. Given the concerns about the conservation impacts of this industry, it is important that market players, regulating bodies and independent observers compile and disseminate the necessary information.

We suggest that now would be a good point at which to undertake an evaluation of the KWS pilot wildlife utilization program. This would help establish the programs successes, failures and lesson learned in order to shape the framework for development of the industry over the next five to ten years.

It is clear that current returns to landowners from wildlife cropping in Laikipia are too low to justify wildlife management as a sole land use. For most landowners, and particularly for community ranches, cropping will remain a marginal livelihood strategy to be combined with other land uses. The structure of the industry at present yields the bulk of the value added from wildlife products to wholesalers and retailers. While vertical integration may not make sense for most landowners, there may be opportunities for shared ownership of abattoir-wholesaling operations, particularly for community and group-owned ranches. Furthermore, there may be opportunities for smaller scale processing of some species at ranch level.

In preparing this paper we often heard the argument that a reintroduction of sports hunting in Kenya would yield potential returns far higher than any imaginable from cropping. Sometimes this argument was made in reference to the case of southern Africa, where there is only a limited cropping industry and limited consumption of game meat off ranch. Discussion Paper No.4 in this series will address the issue of the opportunity cost of the hunting ban in Laikipia.

We conclude that the game cropping industry in Kenya is growing and that it represents a valid and potentially attractive land use opportunity for Laikipia landowners. Deregulation of the industry as a whole would lead to rapid market growth and an opportunity for landowners to negotiate higher gate prices for their wildlife from wholesalers.



### *So how can earnings for Laikipia landowners from wildlife cropping be increased?*

- 1) A critical opportunity for the whole Kenyan cropping industry will come if KWS *removes the current regulatory barriers, particularly the ban on domestic tanning and sale of wildlife skins with hair on, and the ban on advertising and marketing of game meat products.* The potential market within Kenya for processed game products is thought to be large. The challenge for the various wildlife forums and associations, and now for the newly formed National Landowners Wildlife Forum, will be to ensure that liberalization of the industry is associated with good discipline and minimal abuses of the system.
- 2) *Improve product quality and product marketing.* The Laikipia Wildlife Forum should continue to support ranchers and abattoirs in increasing the quality of the skins produced and in accessing more buyers.
- 3) *Work with KWS to improve the processes and turnaround times for approving cropping quotas and for issuing wildlife cropping related licenses e.g. export permits.* Joint preparation by the wildlife forums and associations and KWS of a “Kenya Wildlife Cropping Report” each year with clear statistics and other information would help bring transparency to the cropping industry.
- 4) *Re-examine the structure and pricing of the abattoir-wholesale business in Laikipia,* looking at opportunities for increasing prices paid to landowners for wildlife and at opportunities for landowners, particularly community and group ranches and smaller individual ranchers, to have part ownership of abattoir and small-scale processing operations.
- 5) *Build the competitive advantage of Laikipia as a source district for game meat products for both human and animal consumption.* Laikipia has higher transport costs to the main game meat market, Nairobi, than do Machakos and Kajiado for example. However, Laikipia has a much higher quota for zebra than other districts, and can lead in the supply of zebra meat and skins, as well as diversifying into other species in line with current quotas. Greater co-operation within LWF on establishing transport and distribution networks for wildlife products will allow all landowners to benefit from the anticipated liberalization of the cropping industry. LWF could also facilitate more research into the production and marketing of processed game meat products, perhaps in co-operation with a leading chilled products distributor such as Farmers Choice .
- 6) *Improve opportunities for all Laikipia landowners, large and small, individual and communal, to benefit from wildlife cropping* either directly or through the payment of “grass rents” for their protection of wildlife resources. A form of “revenue-sharing” mechanism, the concept is that landowners who manage wildlife resources for the benefit of their neighbors’ businesses should receive a fee, probably based on weight of wildlife managed, for safeguarding the wildlife resource. This would help to maintain healthy wildlife populations for tourism, cropping and perhaps hunting uses.
- 7) *Encourage the development of more wildlife enterprise opportunities in Laikipia and help access the support needed to make these enterprises successful.* If liberalization happens there will be opportunities for small businesses in tanning, leather-working, meat processing and so on. Support for these enterprises can be accessed through government sources (e.g.

the KWS partnership program), the private sector (e.g. various donor-funded micro-enterprise schemes) and/or NGOs (e.g. the African Wildlife Foundation's Wildlife Enterprise Business Services (WEBS) center, and the African Conservation Center).

- 8) *Analyze the successes, failures and lessons learned from the pilot utilization program to date. Disseminate this information and use it to shape an industry framework for monitoring, managing and marketing wildlife cropping for the next decade. There is a clear role for LWF and MWF to lead this process as the forums with the most diverse and numerous members and the most experience of wildlife cropping to date.*

The third Discussion Paper in this series will look at the opportunities for increasing landowner earnings from wildlife tourism in Laikipia.