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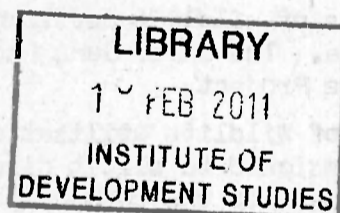
SOME ECONOMIC PROBLEMS OF
WILDLIFE UTILIZATION
IN KAJIADO DISTRICT

submitted by:

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Kenya

ABSTRACT

Wildlife, as a renewable natural resource, has considerable economic value in present-day Kenya. It is a key factor in the tourism industry (worth shs.520.5 million in 1972), of which the hunting industry may be viewed as an adjunct, but one which earns a lot for the country while making minimal demands on infrastructure. Cropping and live capture have considerable, largely untapped, potential. In 1972 Government set up the 17.2 million shilling UNDP/FAO Wildlife Management Project to explore economic, biological technical and land planning aspects of wildlife development. Kajiado District now selected as the test area. The Chief Game Warden is Chairman of the Co-ordinating Committee of the Project.

Problems of Wildlife utilisation are numerous and complex. This paper is designed to elicit discussion on one of the more challenging in each of the three major activities, tourism, hunting and cropping. The further problem of how these legitimate ranching activities might, at least theoretically, be integrated with livestock development is then discussed.

Basic areas which would repay the effort of intensive research are suggested in outline at the end of the paper.

Because the general subject is currently of immense, but frequently rather sketchy, interest, details on the set-up of the project and progress to date are given in Appendix II.

INTRODUCTION

Wildlife has considerable economic value in Kenya at present in that it provides one of the main foundations of tourism which is the leading growth industry and is also a major earner of foreign exchange - Sh. 520.5 million in 1972, of which at least 70% is net. The professional Hunting Industry brought in Sh. 40.1 million which was 9% of total revenues. It was earned from much less than 1% of total visitors with very little demand on infrastructure and capital investment. Examining past trends in the demand for tourism and safari hunting there appears to be great potential for the expansion of these industries in Kenya and government planners anticipate that the tourist industry will grow at 12-15% p.a. for the next 5-10 years. Also, cropping and live animal capture are believed to have considerable value yet to be fully developed.

THE WILDLIFE MANAGEMENT PROJECT

In order to realise the full value of both existing and potential forms of utilisation, most species of game must continue to use land outside National Parks. This is because, firstly, few parks are complete ecological units and most have problems similar to Nairobi National Park (118 km²) from where herds seasonally migrate over 2000 km². Secondly, such parks are utilised for tourist viewing only, so other forms of utilisation must be carried out in other areas. The introduction of livestock development schemes in marginal land areas means additional planning and development is necessary to maintain and properly utilise the wildlife resource. As a result the 1972-6 joint UNDP/FAO government financed (Shs. 17.2 million) Wildlife Management Project (KEN 71/526) has been set up. Basically, it is a wildlife utilisation project covering economic, biological, technical and land planning aspects of wildlife development. It deals with four forms of utilisation: tourist viewing, safari hunting, game cropping for livestock products and capture of live animals. Kajiado District (22135 km²) has been selected as the development area in which the Wildlife Management Project (WMP) operates because it is a major viewing and hunting area even though wildlife only comprises 10-15% of the total liveweight biomass. Subsequent results can be used as a basis for wildlife development in other areas of Kenya. The objectives of the Project set out in the project document are as follows:-

A. Long Range Objectives of the Project

1. Develop policies for improved management of wildlife populations.
2. Develop and demonstrate economic returns from wildlife.
3. Assist the Government to include wildlife in formulating plans and implementing programmes to improve the economic returns from range land.

B. Immediate Objectives of the Project

1. The immediate objectives of the Project are:-
 - (i) To determine biological factors influencing wildlife populations, including trend and condition studies of the vegetation.
 - (ii) To investigate, develop as appropriate and to assist in implementation of wildlife utilisation programmes.
 - (iii) To determine the degree of competition for food and water between the various species of wildlife, between wildlife and domestic livestock, and to establish their comparative efficiency of conversion of forage to meat, including if possible zebra and wildebeest meat.
 - (iv) To evaluate the economic potentials for wildlife utilisation.
 - (v) On the basis of information generated to develop and implement in Kajiado District an extension programme to advise ranchers on how best to make use of wildlife in managing their land.
2. It will be a purpose of the project to identify investible Projects.

The organisation, scope and progress to date of the project are set out in tabular form, for consideration, in Appendix II.

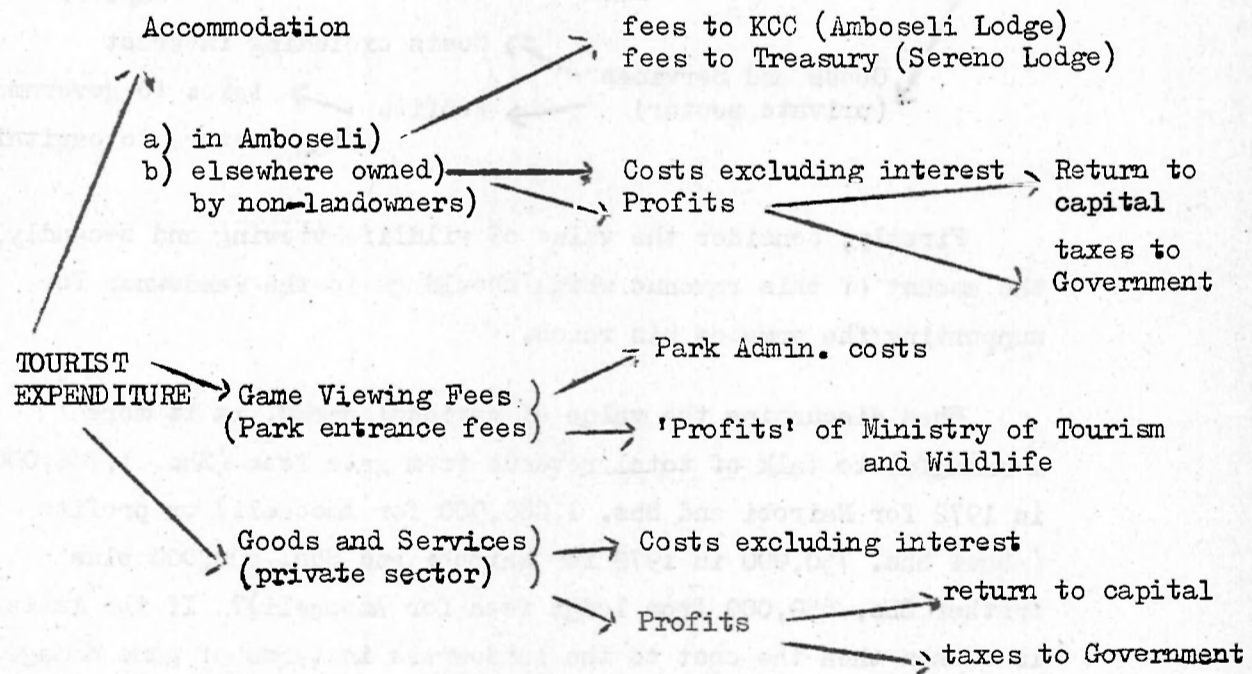
The problems of wildlife utilisation are so numerous and complex that this seminar can consider only a limited number of the economic problems involved. For this purpose the remainder of the paper is divided into five parts: in the first three, one of the more interesting economic problems for each of tourism, hunting and cropping will be discussed and in the fourth part income generating

combinations of wildlife and livestock enterprises are considered. Finally, research opportunities will be outlined.

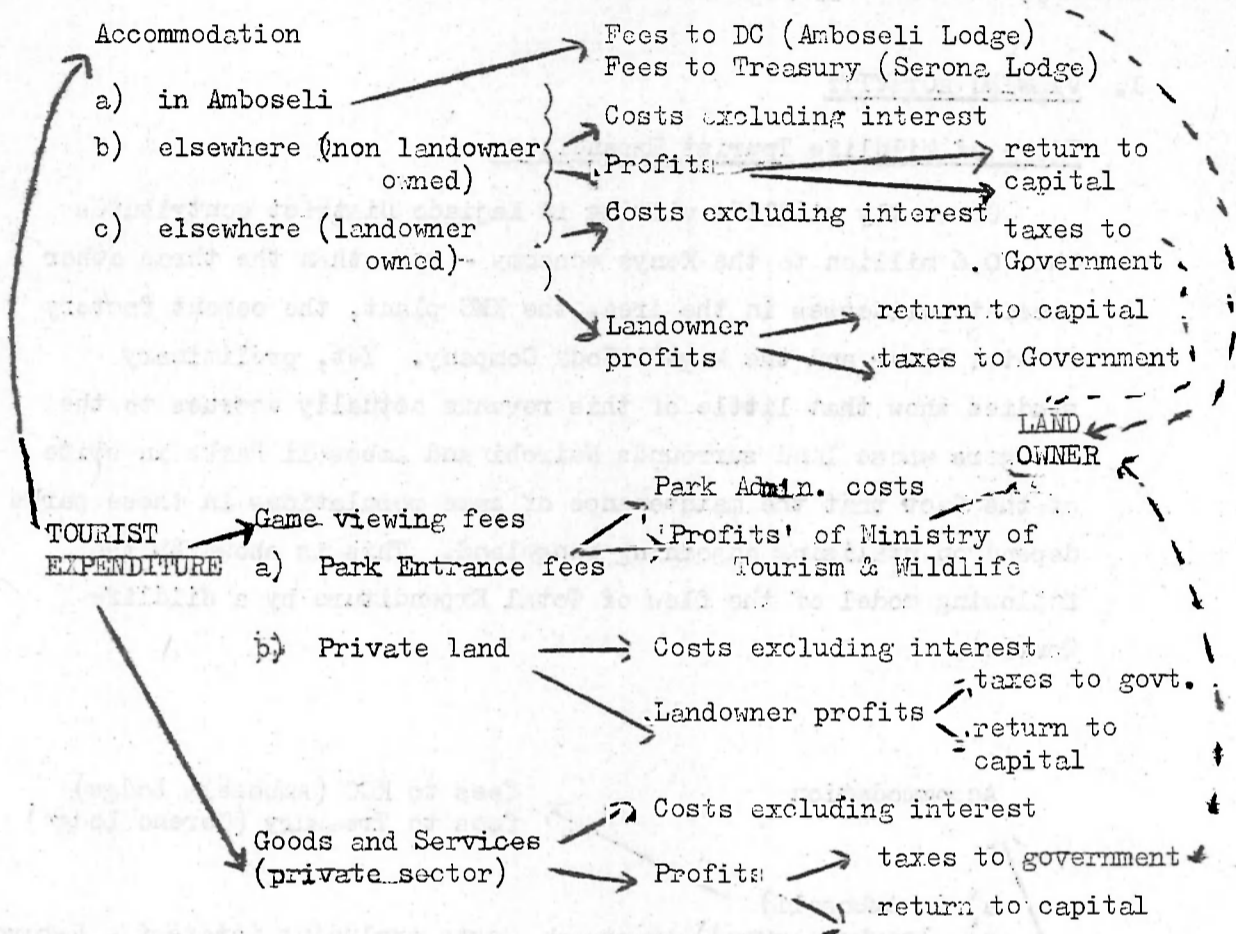
I. VIEWING ACTIVITY

Flows of Wildlife Tourist Expenditure

Currently wildlife viewing in Kajiado District contributes Shs.70,6 million to the Kenya economy - more than the three other present businesses in the area, the KMC plant, the cement factory of Athi River and the Magadi Soda Company. Yet, preliminary studies show that little of this revenue actually accrues to the ranchers whose land surrounds Nairobi and Amboseli Parks in spite of the fact that the maintenance of game populations in these parks depend on utilising adjoining rangeland. This is shown by the following model of the flow of Total Expenditure by a Wildlife Tourist.



A much more desirable situation would be:-



Firstly, consider the value of wildlife viewing and secondly, the amount of this revenue which should go to the landowner for supporting the game on his ranch.

When discussing the value of national parks, is it more meaningful to talk of total revenue from gate fees (Shs. 1,764,000 in 1972 for Nairobi and Shs. 1,080,000 for Amboseli) or profits (about Shs. 750,000 in 1972 for Nairobi and Shs. 600,000 plus a further Shs. 650,000 from lodge fees for Amboseli)? If the latter is chosen then the cost to the landowners in terms of game damage, disease transmission and so on should be included in the calculation of payments to landowners. Obviously the two approaches will give different answers but the latter seems preferable in theory (though it may be difficult to implement) because it takes account of the different costs of the parties involved.

Direct expenditures on hotels and transport by tourists viewing game amounted to almost Shs. 30,000,000 in 1972, - Shs. 15,552,000 for Amboseli and almost Shs. 14,000,000 for Nairobi.

In addition we must take account of supporting bednights elsewhere which are not directly associated with game viewing in these two parks. Both direct and indirect receipts arise because of the wildlife attraction, therefore some of this revenue should flow back to those landowners who support the wild animals.

A reflection of the value of tourism is that government receipts from a variety of taxes, levies and other imposts on this sector amounted to Shs. 120.9 million in 1972 of which 22% is due to Kajiado District, but how much of this revenue should be transferred either directly or via government to the landowners? It can be argued that it is fortuitous that some landowners occupy an area which has high returns from wildlife utilisation. If this revenue is only realised as a result of investment by other parties, then landowners are not entitled to any financial benefit. However, supporting game populations has an opportunity cost of cattle production foregone as well as game damage, possibly higher vet costs and so on. Also, if net returns to land supporting and utilising game are greater than land which is not then in a free market the prices of land in the former case will rise accordingly. One of the most consequential arguments in favour of payments to landowners is that wildlife utilisation in Kajiado District makes an important contribution to the national economy and therefore the government should ensure that private returns from wildlife are in line with public returns. While this is easily said, lack of data and methods of implementing such payments are serious barriers.

Summary:

- What are the most meaningful and practical criteria for determining the value of viewing?
- What 'routes' should wildlife tourist revenue take?
- How much revenue should go to landowners
 - a) in total?
 - a) to individual landowners?

II. HUNTING ACTIVITY

Professional safari hunting constitutes the second major form of wildlife utilisation in Kenya and 15% of this industry is

supported by Kajiado District. It is important, then, to determine ways in which returns from hunting in this area can be maximised for the landowner and the economy as a whole. This can be considered a marketing problem since for each management area, a quota of animals available for hunting is calculated on the basis of population estimates and refined using results from previous years. But what is the most effective method of maximising the revenue from the sale of these animals? There is considerable scope for independent work in this area even though the Project is currently introducing changes in the organisation of the hunting industry.

At this point the distinction must be made between landowners and government. For the government a licensing system can be a very powerful tool in maximising returns since it enables discrimination between various classes of hunter and of game species. Current licenses can be divided into two categories: general hunting licenses which discriminate between residents and non-residents and special licenses which apply to particular species and can be priced according to the demand for, and availability of, that species.

For the landowner, returns to both the individual landowner and the industry as a whole will be maximised if each landowner makes a separate contract with professional hunters on the basis of the quality of hunting available. In the case of government controlled land the existing system is to divide land into hunting blocks and charge standardised fees. This obviously results in loss of revenue since some blocks provide better hunting than others but the standardised fees will reflect the value of the poorest blocks. In Kajiado District an attempt is being made to rectify this by testing such methods as tendering and concessionaire hunting in which a contract is made with a safari hunter for a particular area of land.

Appendix I sets out feasible costs for proposed mini-safaris. This type of safari is dependant on shooting the more common species and taps two new sources of revenue: The short-stay businessman attracted because he only has a brief time available and the middle-income group tourist who can only afford an inexpensive safari. It is anticipated that such a system will have a minimal effect on revenue from traditional

^s
safari/since they usually concentrate on the Big 5 and/or some of the rarer species. A more significant factor in limiting returns from mini-hunting is congestion since financial success is likely to depend on it being a high density activity.

Summary:

- Is the hunting industry maximising its return? if not, what reorganisation is necessary?
- What criteria should be used to divide this revenue between landowner, professional hunter and government?

III CROPPING ACTIVITY

Evaluation of Returns from Cropping

The Project has selected medium-sized herbivores such as zebra, kongoni and wildebeest for cropping because of their ease of capture, handling, and slaughter to produce meat for human consumption. This is the first attempt at large-scale sustained cropping in Kenya. Due to geographic and economic differences, experiences elsewhere shed little light on the economics of such an operation. Yet, the extent of its development will depend on its economic value.

Theoretical approach

Conceptually we can express returns from cropping

$$R = P_{m1} q_1 + \dots + P_{mn} q_n + P_{B1} q_n - FC - V_1 q_1 \dots V_1 q_n$$

- Where
- P_{m1} is the price of meat from species 1
 - P_{B1} is the price of by-products of species 1
 - q_1 is the number of species 1 cropped
 - FC is the fixed costs of cropping
 - V_1 is the variable costs of cropping species 1

A truly theoretical approach would treat q as a controlable¹ variable but it will need such more experience and considerable development of wildlife management techniques to be able to control the numbers of each species in relation to the total population. The calculation of sustainable offtake rates

are dependant on biological and ecological factors but this seminar is concerned with economic aspects, therefore, let us take this information as given. Hence q is externally determined since as long as the marginal variable costs of cropping are less than the marginal revenue it is economically worth while to take the maximum biological crop. The Wildlife Management Project is taking a close look at the skin and hide industry which is well developed in Kenya so the value of byproducts (P_B) can be estimated fairly accurately. On pricing meat (P_m) the question is somewhat more complex as the game meat market in Kenya is very underdeveloped. To put a low value on game meat implies that it is an inferior substitute for domestic meat but on the other hand how much can be absorbed into the tourist market and at what price? Cropping costs (FC and V) are currently the result of much guesswork but further work could produce accurate estimates.

Estimate of Returns

The following estimate of returns is a feasible one given present unsubstantiated data.

Total number of animals croppable p.a.:-

Eland	-	800
Grants Gazelle	-	1600
Thompsons "	-	300
Impala	-	600
Kongoni	-	700
Wildebeest	-	4000
Zebra	-	3400

Total meat production passed fit for human consumption

	900,000 kg at 2/85	-	2565000
Skins: Zebra at 300/= each		-	1020000
Others at 30/=		-	<u>240000</u>
	Total revenue		3825000
	(including 20% profit) Cropping costs ..		1350000
	Available for distribution to ranchers..		2475000

There is the problem of dividing revenue from cropping between the individual landowners since it is expected that eventually cropping will be carried out by large scale private

enterprise ~~working in~~ the whole of Kajiado District. One suggestion is to let the landowners distribute the revenue between themselves on the basis of their local knowledge of game numbers and movements with the amount received by each landowner varying directly with the extent to which he encourages game.

Summary:

- How sensitive is the optimum offtake rate (i.e. where profit is maximised) to inaccuracies in the value of the variables used in its calculations?
- How should returns from cropping be divided between the cropper and the landowner?

IV INCOME GENERATING COMBINATIONS OF WILDLIFE AND LIVESTOCK ENTERPRISES

Optimising Landuse Patterns

This is one of the most interesting areas for discussion since what we are really concerned with is optimising landuse. However, to analyse this problem it is necessary to understand not only the wildlife utilisation activities but also the livestock sector. Currently, with aid from the World Bank amounting to over Shs. 400 million, there are ambitious plans to develop Kenya's livestock industry and Kajiado District will be one of the main recipients of this aid. This will have far reaching effects on the wildlife in that area hence livestock development plans must be adequately taken into account when planning wildlife utilisation. For example, the initial step of land adjudication will, in practice, give the Maasai much greater control over wildlife.

Financial analysis of each particular enterprise should result in a method for determining the optimal level of each activity. But it is necessary to go further since ultimately we are concerned with maximising total returns to the landowner (and of course the Kenyan economy).

Hence the development of a standardised method of determining the optimum combination and level of intensity of wildlife and livestock enterprises for a given situation is necessary.

~~One approach would be to develop existing methods of farm~~ analysis but there are significant problems due to the inherent characteristics of wildlife.

For example,

- The landowner is unlikely to have any sort of estimate of the numbers of game on his land over any given time period.
- He has little control over game movements, reducing any possibility of marginally adjusting their numbers or implementing a controlled grazing system.
- A knowledge of current stocking rates, carrying capacity, and so on, is assumed but this data is available ^{for} only small parts of Kajiado District.
- The nature of wildlife utilisation activities is such that many more exogenous factors occur than in a typical farm analysis. For example, organisation of cropping is unlikely to be at ranch level.

The type of analysis which is applicable will change over time. Firstly, methods of herd management will change as the Maasai move from a subsistence economy based on milk production to a cash-orientated economy. Secondly, rainfall currently has an effect on cattle available for marketing but water development will reduce such fluctuations. However, rainfall will continue to have a significant effect on wildlife populations. Therefore, it is necessary to consider not a single year period but a 10, 15 or even 20 year period. However, to understand the dynamic situation it should at least help to have a clear idea of the static situation.

Summary:

- How can we develop a sufficiently flexible method of determining the optimum combination and distribution of cattle and game
 - a) at ranch level
 - b) nationally?

V RESEARCH OPPORTUNITIES

Many of the economic problems of wildlife utilisation which need to be solved are within the scope of independent researchers.

The Project document provides for post graduates to be associated with the Project. On the economic side, Graduate student A starting in 1974 could evaluate the benefits of alternative hunting and cropping systems as developed by the Project. After gaining a preliminary knowledge of other forms of wildlife use he might identify and develop in depth the economic rationale for combinations of wildlife activities. He could complete his work with an economic and social cost/benefit study. Graduate Student B starting in 1975 could work on wildlife/livestock enterprise combinations and developing an input-output analysis and research the joint production relations. In addition, the Project would welcome assistance from anyone else wishing to work on economic aspects of wildlife utilisation and will be pleased to provide them with any help they may need.

Mini Safari Cost (one day, 1972)

(a) <u>Annual Costs of the Operator Running Mini-Safaris into the Athi-Kapiti (600 clients p.a.)</u>		
i	One hunter per client at £5	£3,000
ii	2 full-time trackers and skinners at Sh.10 per day (note that more would be hired at busy periods, fewer at less busy periods)	£ 365
iii	<u>Transport</u>	
	(a) one round trip Nairobi-hunting areas 250 days per year, 100 km at Sh.2	£2,500
	(b) Travel in hunting area, 50 km/hunter	£3,000
iv	Ammunition, Shs.1/animal	£ 60
v	Gun-rental, say £5 per hunter	£ 300
vi	Assistant's permit	£ 100
vii Sub-total, specified costs		£9,325
viii Contingencies and Profit, 15%		<u>£1,399</u>
ix Total, before commissions		£10,724
x Commissions, 10% of full price		£ 1,192
xi Total basic price, before licences		£11,916
xii Price per hunter, xi)		£19.86 ^{a)}
		(US \$55.61)
(b) <u>Licences and Fees Before Leaving Nairobi</u>		
i	Hunting Licence (assumed)	5.00 ^{b)}
ii	Special Licence (avg. per hunter)	4.18 ^{c)}
iii Sub-total, basic licences and fees (1+11)		9.68
		(US \$ 27.13)
(c) <u>Controlled Area Fee (for animals shot)</u>		
i	Existing fees	£8.71
ii TOTAL SAFARI PRICE (US \$107.10)		£38.25
iii Higher "possible" fees (profit)		£29.04 ^{d)}
iv TOTAL SAFARI CHARGE (US \$164.02)		£58.56

- a) Compares with £80 per day charged by outfitters for "maxi-safaris" in 1972
- b) Much lower than existing rates
- c) It would probably be desirable also to reduce the special licence fees for animals shot on ranches.
- d) Based on actual charges already obtained by some private landowners. (Assistance of Dr. F. Mitchell with this Table gratefully acknowledged).

APPENDIX II: STATEMENT ON PROGRESS OF PROJECT ACTIVITIES

Work or Job Plan Number	Title	Designation of Assignment
Preparatory Activities by U.N.D.P./ F.A.O. and Kenya Government	<u>Recruitment of FAO Personnel</u>	Manager, Dr. W. Swank Wildlife Biologist Resource Economist Wildlife Veterinarian Habitat Ecologist Pilot Biologist Administrative Off.
	<u>Government Personnel</u>	Project Co-Manager M. Macharia D. Sindiyo Veterinarian (Ombokel) Veterinarian (Chana) Wildlife Biologist (Andere) Wildlife Biologist (Mbai) Wildlife Biologist (Mumiukha) Habitat Ecologist (Lusigi) Extension Officer Resource Economist (Njoroge) Resource Economist (Apoli) Administrative Off. (Munge) Pilot Biologist

Scheduled Starting Date	Scheduled Finishing Date	E.O.D. Date/ Status	Assessment of Future Progress
1.4.1971		On Station	Assignment under PPA
1.4.1971		1.4.1971	Assignment under PPA
1.6.1972		OS 13.7.72	
1.6.1971		OS 5.11.71	
1.7.1972		OS 21.8.72	
1.9.1972		OS 3.1.73	
1.7.1972		OS 1.7.72	
1.3.1972		OS 1.7.1972	
		OS 15.11.72	
March 1972		OS 16.5.72	
March 1972		OS 16.5.72	
March 1972		OS 1.7.72	
March 1972		OS 10.7.72	
March 1972		OS 14.8.72	
March 1972		OS 9.10.72	
March 1972		OS 29.11.72	
March 1972		OS 10.5.72	
March 1972		OS 9.11.72	
March 1972		OS 20.7.72	
March 1972		OS 10.8.72	

Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date
3a	Population Levels	Pilot Biologist (Wildlife Biologist & Counterparts (2))	Jan/Feb 1972

Scheduled Finishing Date	E.O.D. Date/ Status	Assessment of Future Progress
Continuing twice a year (census) and twice a year (reconnaissance surveys)	Census completed Feb 73, results published April. Reconnaissance to follow on completion of evaluation of tested strip widths (3) and height (2) made in June, following recommendation by Technical Committee. One recce, survey therefore delayed by 4-6 weeks. Counterpart W/L Biologist removed for flying training, March-June.	Next census August/September. Remainder of 1973, recce survey flights (or low intensity censuses) will be made c. four in all, to collect as much data on population distributions and boundaries as possible, in order to define populations for future census. After the end of 1973, less frequent (i.e. twice a year, as originally planned, should suffice), recce flights will be made. These flights will also provide data for hunting block quotas, as well as movements & general distribution data.

Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date
1b	Sex and age Structure	Wildlife Biologist (Pilot Biologist)	Feb 72
1b(1)	Population Dynamics (Field)	Wildlife Biologist	Sept 72
1b(2)	Population Dynamics (Harvested animals)	Wildlife Biologist	Sept 72
1c	Movements	Wildlife Biologist (Pilot Biologist)	Feb 72

Scheduled Finishing Date	E.O.D. Date/ Status	Assessment of Future Progress
Continuously	Started on schedule. Proceeding, but not in all portions of District.	Expand to other portions of Kajiado by end of 1973.
Periodically	On schedule for parts of Kajiado. Not done in all areas.	Will be expanded to all areas by end 1973
Continuously	Not started. Successful cropping not accomplished.	Plan to be in operation by end of 1973.
Periodically Life of Project	<u>Aerial detection</u> started on schedule but not kept on schedule. <u>Pilot Biologist & plane</u> not on Project until early 1973. Also, some changes being developed in technique. <u>Neckbanding:</u> Behind schedule - trapping not yet successful.	<u>Aerial:</u> Will intensify by end of 1973 and be on schedule <u>Neckbanding:</u> Will proceed as trapping becomes successful

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Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date
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1d(1)	Extension Range Survey of Kajiado District	Habitat Ecologist and Counterpart Habitat Ecologist	Sept 72
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1d(2)	Range Condition & Trend on Selected Key Wildlife Areas	Habitat Ecologist and Counterpart Habitat Ecologist	Jan 73
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Scheduled Finishing Date	E.O.D. Date/ Status	Assessment of Future Progress
Complete map 6-73 Complete Job Plan & report 12-73	Most basic work on aerial photos is complete for vegetation typing, plus some mapping of water availability.	Expect to complete aerial photo work by July 6. Type lines will be transferred to base maps by Aug. 31 after completing all field checks. Overlay map with water availability data will be completed by 12-73 as scheduled.
12-76	Preliminary checks using Skovlin's tentative range-condition and trend analysis procedures indicate it can be adapted to wildlife range evaluations. We are compiling a list of range vegetation by desirability classes to help in this. A permanent 0.7 hectare wildlife enclosure has been constructed on the Isinya Masai Training Centre near Kajiado and utilisation cages located on adjacent open range. This is the only one in the District.	Additional utilisation cages will be established at 3 or 4 other locations as needed to evaluate production and use by wildlife/ domestic stock. Condition-and-trend measurements will be made as soon as the mapping job for 1d(1) is complete.

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Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date
1(3)	Correlation of Habitat with Movement, Productivity & General Body Condition	Habitat Ecologist and Counterparts Pilot Biologist Wildlife Veterinarian Wildlife Biologist	1973
1e	Influence of Diseases, Parasites & Nutrition on Wildlife Populations	Wildlife Veterinarian	1.2.72
1e(1)	Haematology	"	1.2.72
1e(2)	Serology	"	1.9.72
1e(3)	Bacteriology Protozoology Virology	"	"
1e(4)	Nutrition	"	"
1e(5)	Parasitology	"	"
1e(6)	Correlate Metabolic Profiles	"	1.2.72

Scheduled Finishing Date	E.O.D. Date/ Status	Assessment of Future Progress
12-1976	Nothing done yet, as activation of this phase must await (1) collection of basic data from Job Plans 1d(1) and 1d(2) herd productivity and animal condition data collected in census work and as a result of cropping.	As animal concentration areas are detected by aerial census, growth stage and green vegetation and/or water availability will be monitored in the concentration area vs. unoccupied area to provide correlation with animal movements.
Continuous	All these activities are conditioned upon a supply of material from the trapping operation and upon the provision of a laboratory. The first few animals became available in January 1973, but the time of the veterinary staff was fully occupied in training the abattoir crew and in evaluating and modifying the field equipment. Few specimens have so far been collected but the laboratory staff has now been recruited and is ready to start. The cooperation of the District Veterinary Officer, Kajiado, & of the Veterinarian on the F.A.O. Sheep & Goats Project has been assured.	Future progress will be rapid once the establishment of a market allows the slaughter of large numbers of animals. A field laboratory has been set up and we now await the provision of a base laboratory at the new Project headquarters. The interval before the establishment of a market for the meat will be used to further train the abattoir staff and to set up field laboratory routines.

Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date
1f	Role of Predators	Wildlife Biologist (Veterinarian & Economist)	Through life of Project
2a	Wildlife Viewing	In Parks & Reserves adjacent to Project area, viewing is exclusive activity. Management of adjacent areas must be coordinated with objectives of dedicated areas. When ranching enterprises are developed, there may be opportunities for viewing activity. Biological opportunities will be identified, and if land-owner interest is evident, guidance and advice on development.	Job Plan allows 20 days a year for Economist and Wildlife Biologist

Scheduled Finishing Date	E.O.D. Date/Status	Assessment of Future Progress
	<p>Records of predators taken by hunting and of predation on humans.</p> <p>Areas with viewing potential have been assessed and listed. Limited immediate potential except Kitengela. One area (only) has been adjudicated, Kimana. Understand private owner has vague plans.</p>	<p>Continue on low key for 1973.</p> <p>Little chance of developing cash returns to ranchers by end Project. Project will stay alert to opportunities.</p>

Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date
2a(1)	Pre-Feasibility Reports on Investible Viewing Projects	Wildlife Biologist/ Economist	1.11.72
2a(2)	Identify economic implications and criteria for deciding whether grazing rights should be given to such herds; if so formulate criteria.	Economist	1.11.72
2a(3)	Implementation of the Above	Extension Specialist	1.11.74
2b	Sport Hunting	Wildlife Biologist/ Economist	Jan 72

Scheduled Finishing Date	E.O.D. Date/ Status	Assessment of Future Progress
1.5.73	A report identifying areas in preparation	Completed shortly
1.11.73	Proposals have been made for Kitengela as a pilot project	Depending on results of the Kitengela proposal, recommendations will be made for additional areas.
to end	-	-
July 72	New hunting programme developed but not implemented	Will be implemented before end of 1973.

Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date	Scheduled Finishing Date
2a(1)	Hunting Regulations Reviewed	Economist	Jan 72	March 72
2a(2)	Designation of Hunting Areas	Wildlife Biologist Economist	1.3.72	July 72
2b(3)	Design Regulation and Fee Systems to Permit Flexibility	Wildlife Biologist Economist	1.6.72	1.7.73
2b(4)	Potential Returns of Hunting Concessions and Implementation	Economist	1.6.72	1.6.73
2b(5)	Feedback to Monitor Hunting Data	Economist	1.6.72	Continuous

E.O.D. Date/Status	Assessment of Future Progress
<p>Completed</p> <p>Kajiado District has been divided into management and hunting units.</p> <p>System has been proposed to Project Committee and modification instituted. Hunting concessions lease proposal now reviewed by Attorney General's Office and ready for implementation.</p>	<p>Certain modifications recommended for Kajiado District. Those proved to be successful will be recommended for country-wide adoption.</p> <p>Hunting programme now about to be implemented. Feasibility of revisions of hunting areas will be periodically assessed.</p> <p>Awaiting gazetting of Special Chief Game Warden's Permit before possible to implement the proposed regulations.</p>
<p>Internal work completed</p>	<p>Dependent on implementation</p>
<p>Design completed</p>	<p>Awaits implementation</p>

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Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date	Scheduled Finishing Date
2c	Cropping and Marketing			
2c(1)	Catching Animals for Cropping	Wildlife Biologist (Pilot Biologist & Veterinarian)	Jan 72	Continuous
2c(2)	Slaughter of Wild Herbivores, Processing of Carcasses and Development of Inspection Procedures	Wildlife Veterinarian	Jan 72	Continuous
2c(3)	Processing Wild Animal Meat and By-products	Wildlife Veterinarian	Dec 72	"

E.O.D. Date/Status	Assessment of Future Progress
<p>First trapping October 1972. Six trials since then - non operationally successful. Revising techniques. Started small scale shooting.</p>	<p>Continue revising techniques and hope for one operation per month if found feasible. Expand shooting as technique.</p>
<p>In the absence of a market for large quantities of wildlife meat, tentative slaughtering started in Jan 73 and has been carried on at roughly monthly intervals since then in order to train abattoir staff and to provide meat for test purposes.</p>	<p>Future progress will be rapid once a market for the meat is found; however the lack of cold store space in Nairobi is a serious limiting factor since it appears that to attract a quality market game meat should be hung for at least 14 days before sale.</p>
<p>See above. The services of a meat technologist & a hides and skins expert have been sought and approved.</p>	<p>After consultations with the meat technologist and hides and skins expert and once cropping has started on a large scale, progress will accelerate.</p>

Work and Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date
2c(4)	Marketing Products of Cropping	Economist	1.3.72
This is actually 2(c)(vi) + (vii) of P.D.	Make Market Contacts	Project Manager	1.3.72
2d	Ranching	Wildlife Biologist (Economist & Veterinarian)	Jan 72
2e	Capture Live Animals	Wildlife Biologist (Veterinarian & Economist)	Jan 72

Scheduled Finishing Date	E.O.D. Date/Status	Assessment of Future Progress
End Project	Intensive work on local marketing potentials. Building up but slowly. Potential export markets identified.	Local market limited by price. Will give attention to export possibilities. Need and have requested meat specialist and skins specialist.
Will handed over	Domestic sales on track. Export contacts being made.	Not very profitable, but will pay commercially. Need an order. Buyers (domestic/export) need lots of attention. Have received numerous enquiries which are being followed up. This phase needs considerable additional effort.
Continuous	Developing government policy for game farming. No evaluations of other operations. Not much potential now in Kajiado.	Assemble available information on going operations.
Continuous	Some monitoring of what has taken place in Kenya and Kajiado. Contacts made with professional trappers.	Offerings of live animals will be made when trapping successful.

Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date	Scheduled Finishing Date
3a(1)	Determining Degree of Competition between Wildlife Species for Food	Food Habits Analyst	Jan 72	Continuous
3a(2)	Correlate food species and parts from wild animals with availability	"	"	"
3b(1)	Determine frequency of watering & quantity of water used by wildlife	Kiboko Research Station & Galana Ranch	Jan 72	"
3b(2)	Summarise data in literature on wildlife water requirements	Wildlife Biologist	1 June	"

E.O.D. Date/Status	Assessment of Future Progress
Work completed for Rift Valley Study.	Work for Kajiado District to begin August 1973, upon arrival of Food Habits Analyst.
"	"
Data being collected.	
Work underway.	

Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date	Scheduled Finishing Date
3c(1)	Analyse foods of cattle and cropped animals	Food Habits Analyst	1.1.72	Continuous
3c(2)	Compare foods taken by wildlife, cattle with availability	Wildlife Biologist Assoc. Expert	1.1.72	"
3c(3)	Analyse data from paddocked animals to determine food and water trade-off		1.3.72	"
3d	Energy Conversion Efficiencies	Habitat Ecologist Wildlife Veterinarian Wildlife Biologist	1973	12-76

E.O.D. Date/Status	Assessment of Future Progress
<p>Work completed on analysis of cattle, Thomson's gazelle and impala in Rift Valley. Work has value but not directly applicable to Kajiado District.</p> <p>Awaiting arrival of Food Habits Analyst. However vegetative type map in preparation.</p>	<p>Food Habits Analyst to report to Project on 1st Aug. 1973. Work will continue on Kajiado District.</p>
<p>Animals trapped and provided to KEN 11.</p>	<p>Data will become available to project from Kiboko. Experimental trials and trade-offs determined.</p>
<p>Zebra have been captured and added to the Kiboko paddocks which now include eland, Grant's gazelle, kongoni and zebra. No data are yet available on food consumption etc.</p>	<p>Negotiations have not been completed outlining Project responsibility in the Kiboko paddocking study.</p>

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Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date	Scheduled Finishing Date
4	Using information on biological trade-offs, identify income-raising combinations	Economist	1.3.72	Continuous
4(1)	Economics of Viewing Opportunities Outside Dedicated Areas	Economist	"	"
4a(2)	Potential of Hunting	"	"	"
4a(3)	Potential of Cropping	"	"	"
4a(4)	Potential of Ranching	"	"	"

E.O.D. Date/Status	Assessment of Future Progress
Sufficient information on biological trade-offs not yet available to begin analysis.	Methods of analysis under consideration and investigation. Use of computer calculator being analysed.
Release of economic potential for benefit of ranchers appears distant. Inputs provided for Ministry on Kitengela development proposals to World Bank will provide test case and be used as pilot project. Amboseli ecosystem proposals completed.	Site visits with consultants provided by Ministry to be made. 1st general report due Feb 74. Denoting major emphasis on additional areas for wildlife viewing will depend upon success of Kitengela pilot project.
Have analysed previous system. New system not yet going.	Develop systems for assessing new systems.
Following job plan. Costing system developed. Forms for information analysis.	Depends on success of trapping techniques and marketing.
No activity for analysis so far.	An unlikely activity in project area.

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Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date	Scheduled Finishing Date
4a(5)	Potential of Capture	Economist	1.3.72	Continuous
4a(6)	Income Generating Combinations	"	"	"
4b	Feasibility Studies as Necessary	"	"	"
4c	Enterprise Combinations of National Interest	"	"	"

E.O.D. Date/Status	Assessment of Future Progress
Accumulated past information. Analysis incomplete.	Depends Project's ability to deliver.
Various discussions, etc. with Ministry, World Bank officials, Agriculture, A.F.C. Preliminary model begun.	Preliminary work. Constant attention though Job Plan Starts in 1974.
Concentrated on cold storage - (completed). Provided also M.T.W. for inclusion World Bank loan. Work on canning and meat meal in progress.	On track.
Insights provided to World Bank re. 2nd Livestock loan - see also 4a(6).	Graduate students.

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Work or Job Plan Number	Title	Designation of Assignment	Scheduled Starting Date	Scheduled Finishing Date
5a	Contact landowners to explain project objective	Government Extension Officers	1.3.72	Continuous
5b	Establish information and demonstrate programme	"	1.7.72	"
5c	Establish feed back programme	"	"	"
6a & b	Wildlife Management Programme	Wildlife Biologist (All pro- ject staff)	March 72	Dec 1974
7	Identify further research & manage- ment needs	All Project Staff		Continuously

E.O.D. Date/Status	Assessment of Future Progress
Constant contact being maintained.	Progressing satisfactorily.
Landowners involved in Project activities whenever and wherever possible.	"
Constant contact maintained between landowners, extension officers and project personnel.	"
New management approach developed and implemented for all but hunting.	Apply hunt management to new programme. Develop feedback system for biological, sociological and economic information into the management system.
In progress.	Too early for formulation of recommendations.

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