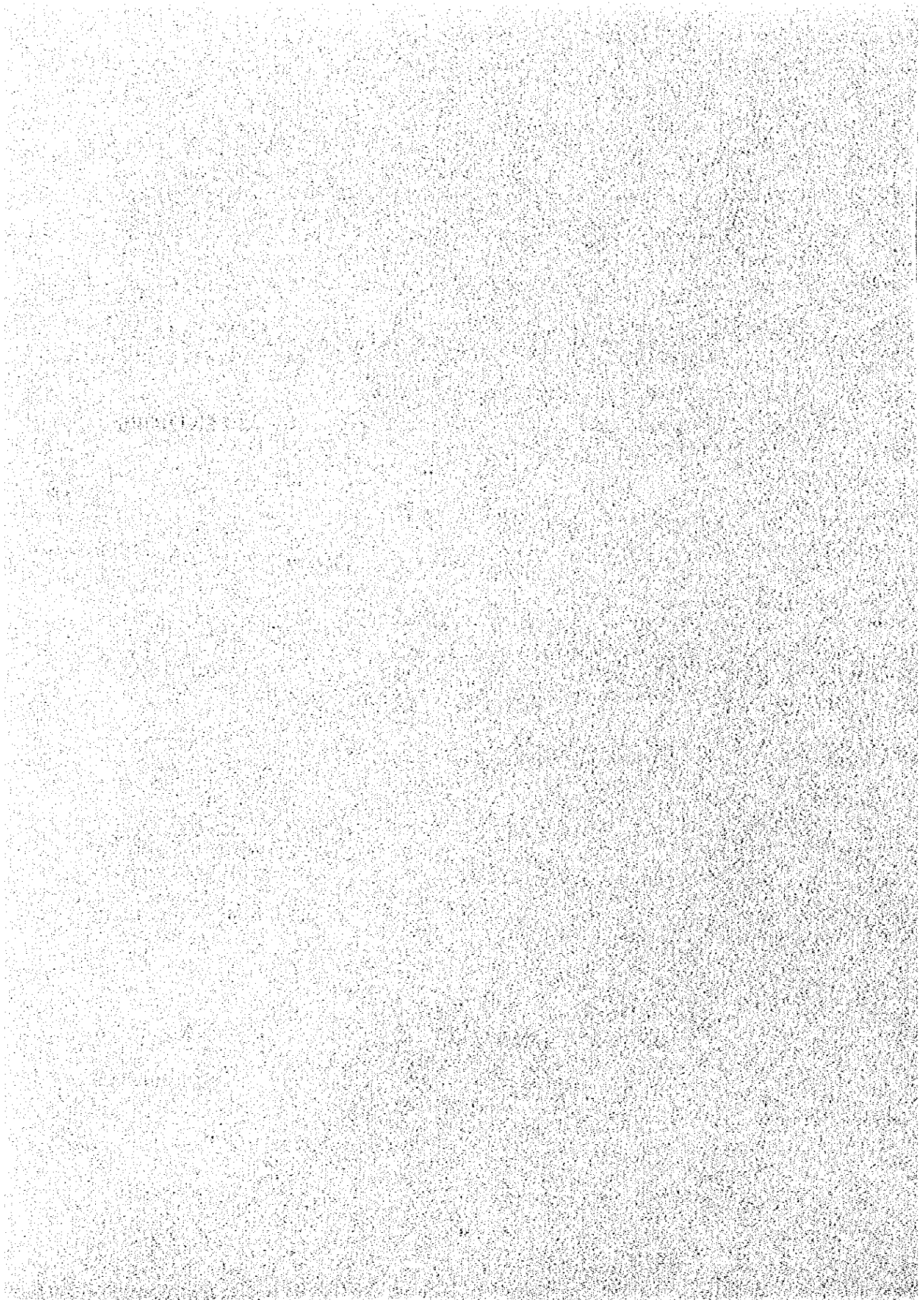
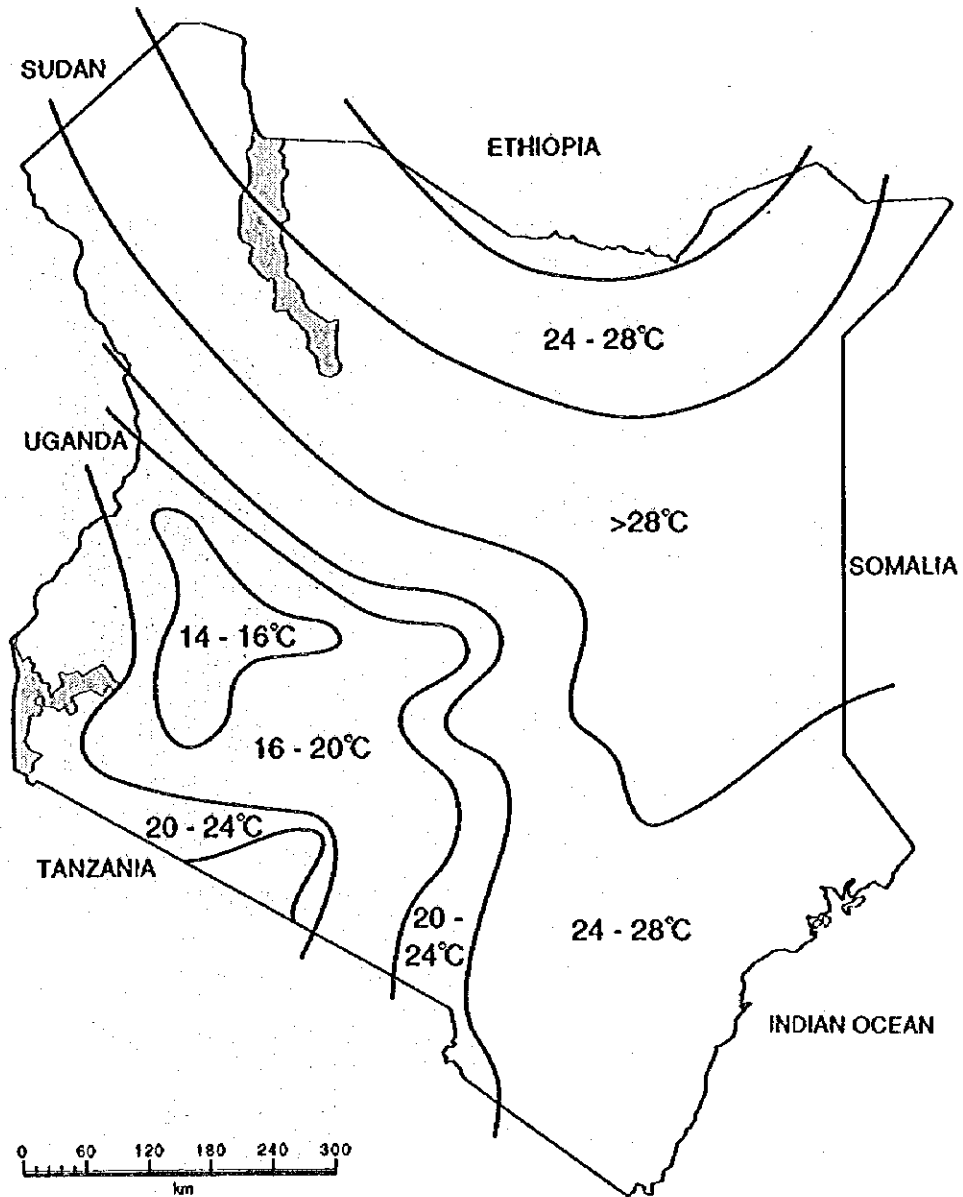


APPENDICES

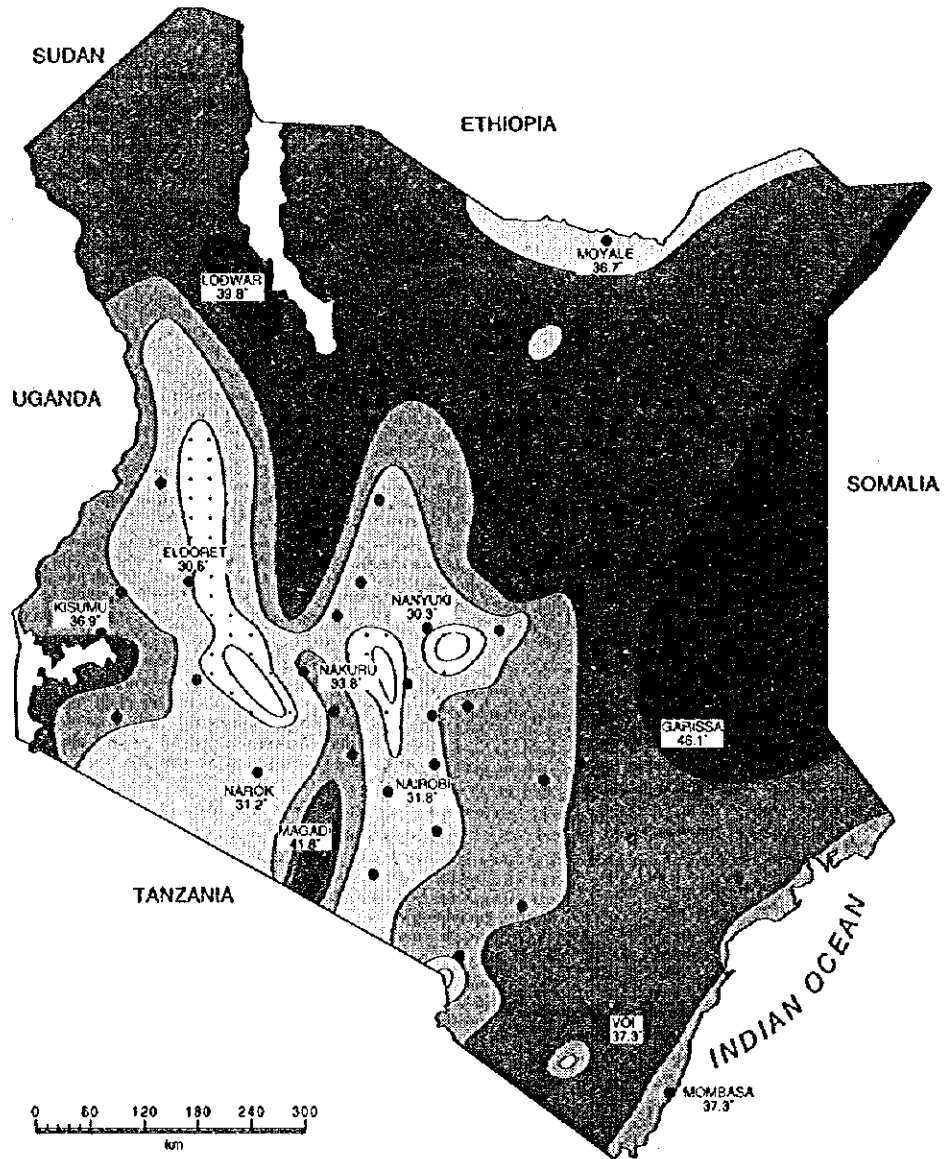


Appendix 1.1 Mean Annual Temperature (°C)



Source : Ministry of Water Development / JICA (1992)

Appendix 1.2 Maximum Temperature (°C)

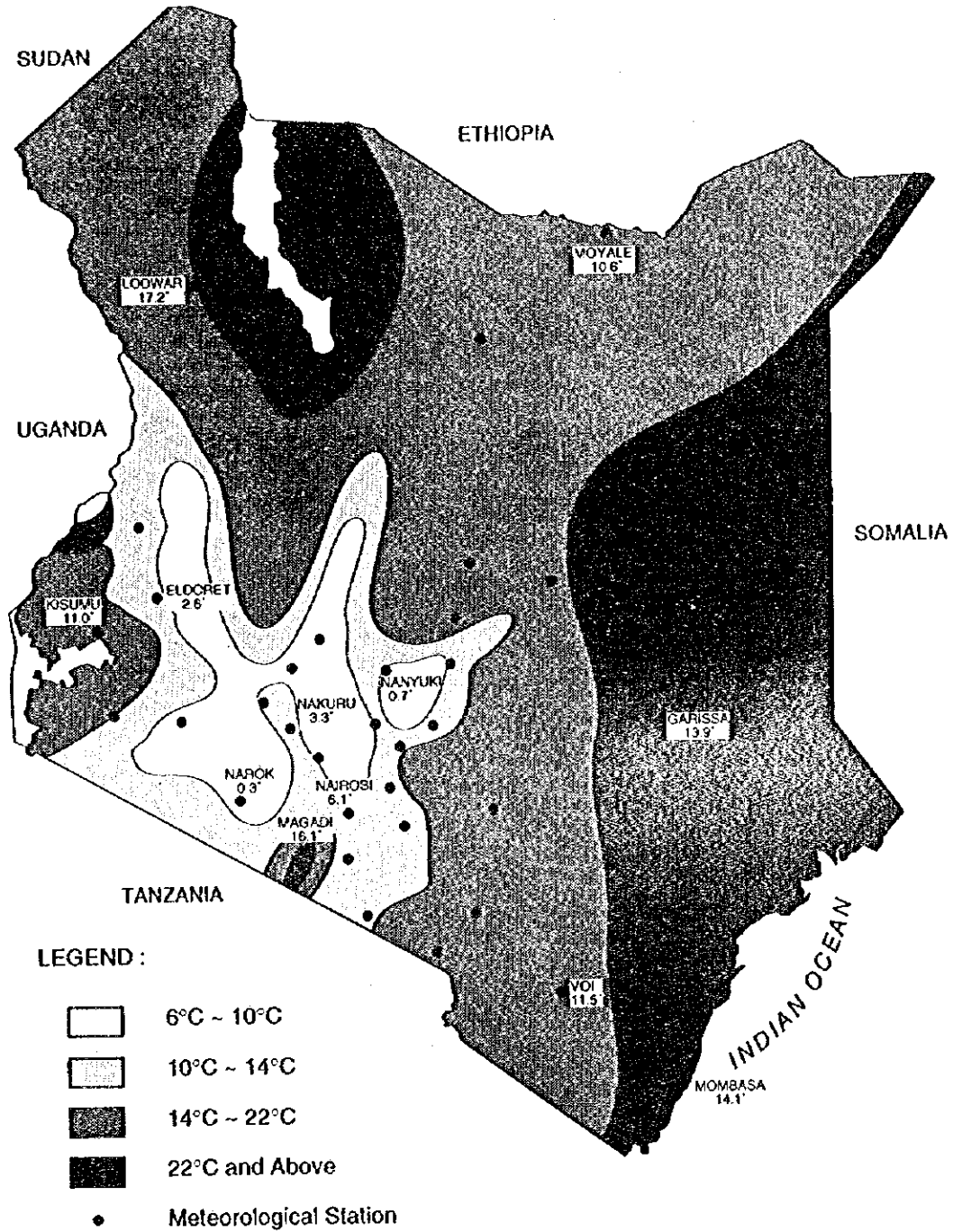


LEGEND :

- Below 18°C
- 18°C ~ 22°C
- 22°C ~ 26°C
- 26°C ~ 30°C
- 30°C ~ 34°C
- 34°C and Above
- Meteorological Station

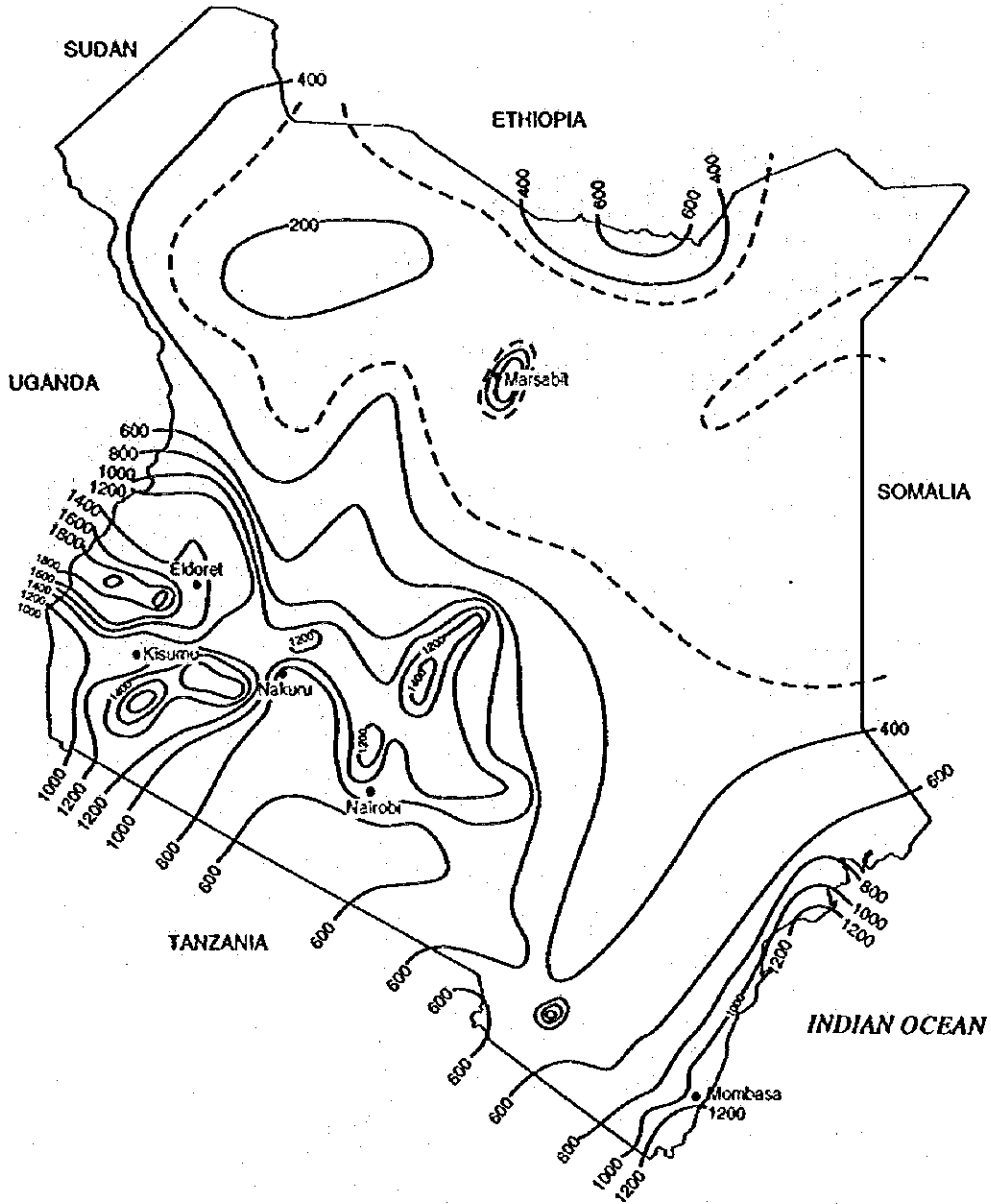
Source : Survey of Kenya (1970)

Appendix 1.3 Minimum Temperature (°C)



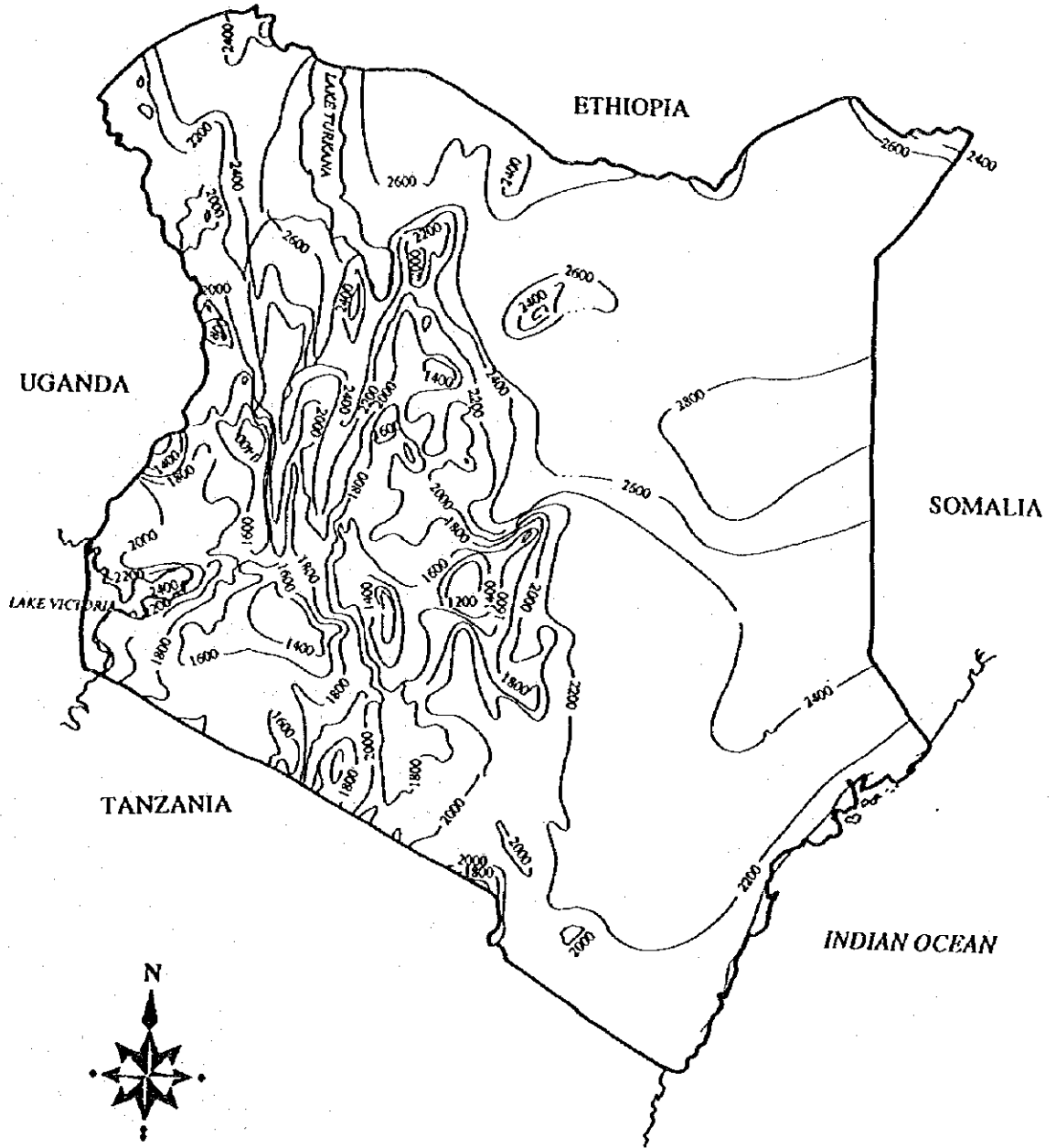
Source : Survey of Kenya (1970)

Appendix 1.4 Annual Rainfall (mm)



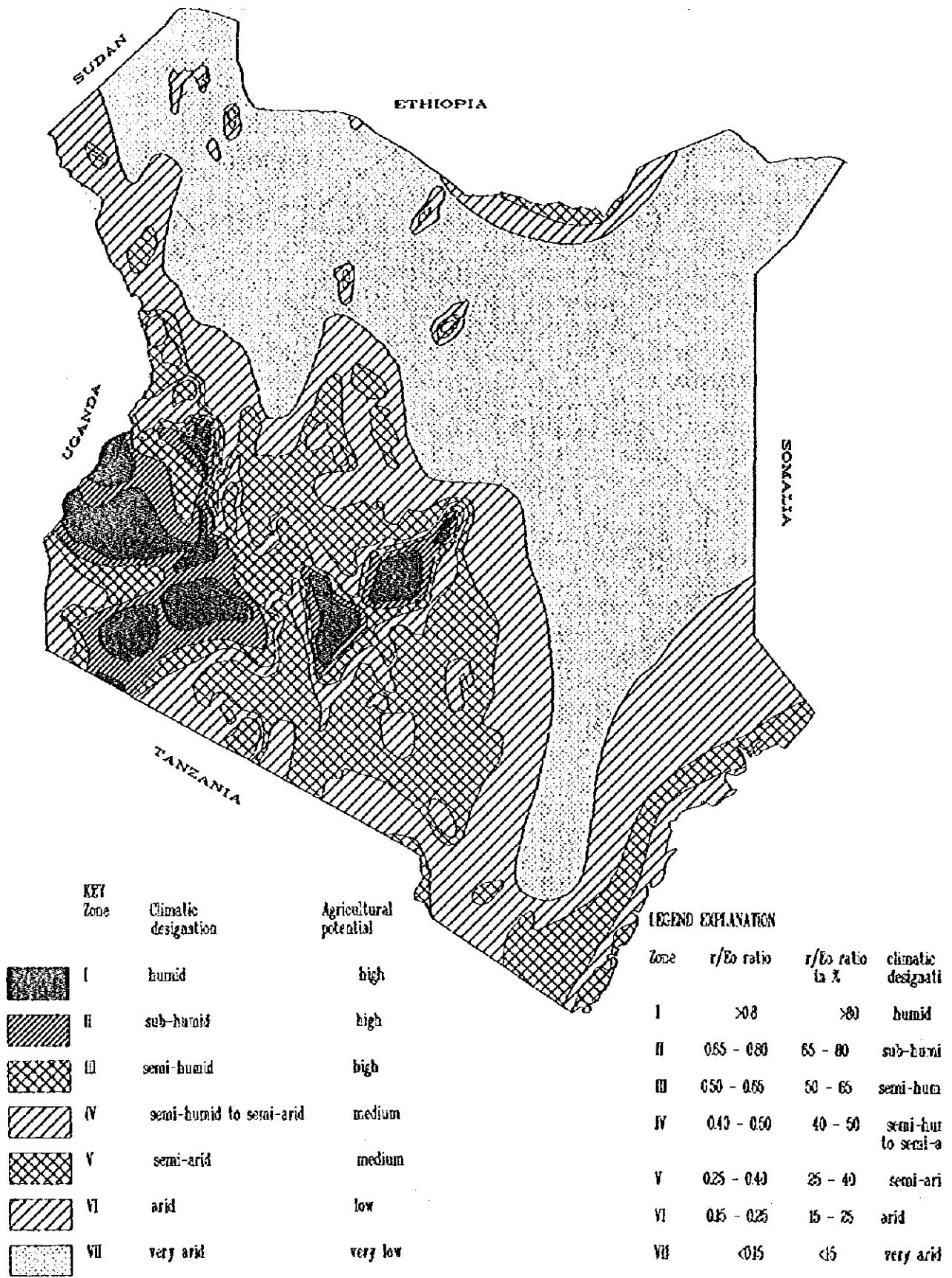
Source : Ministry of Water Development / JICA (1992)

Appendix 1.5 Annual Potential Evapotranspiration (mm)



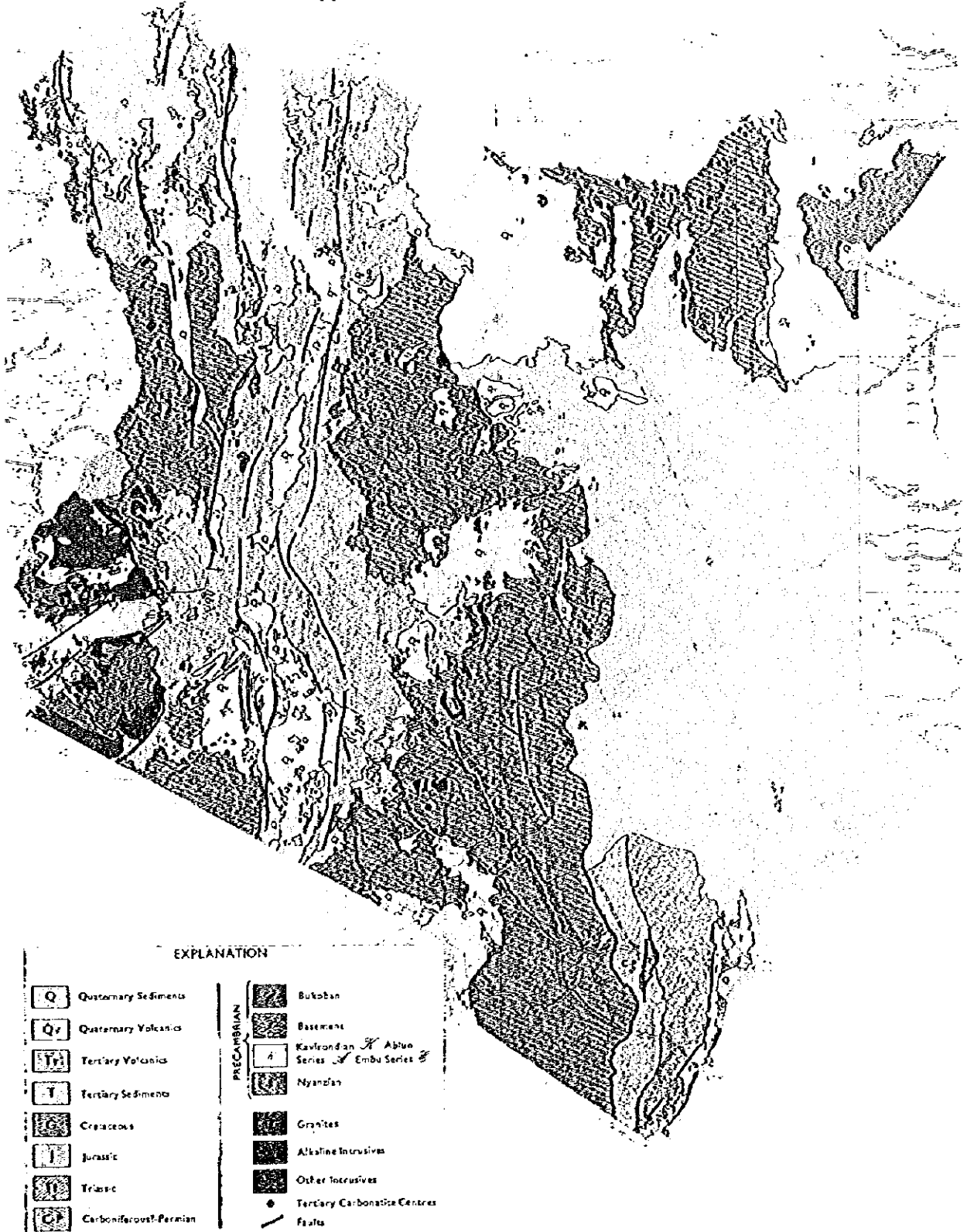
Source : Ministry of Water Development / JICA (1992)

Appendix 1.6 Agro-climatic Zone Map of Kenya



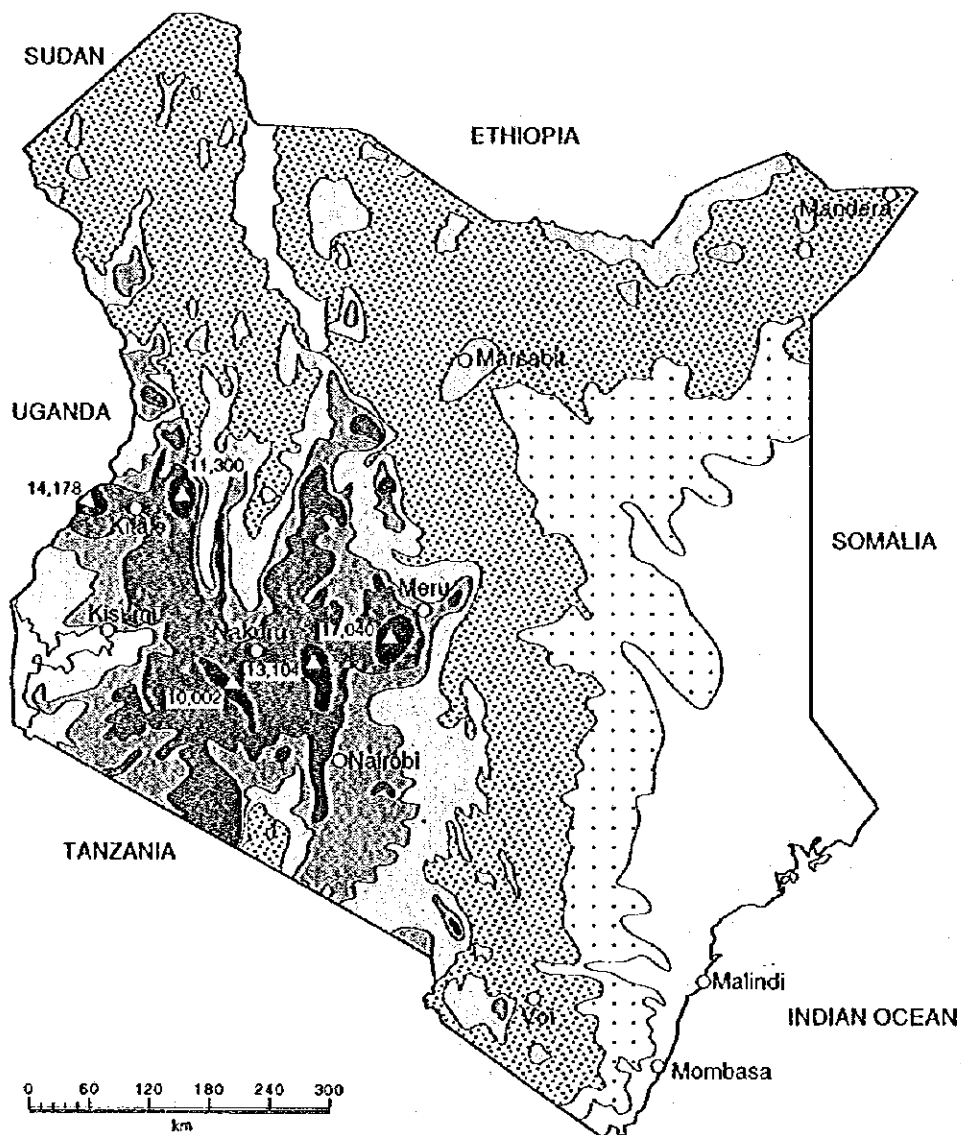
Source: Kenya Soil Survey (1982)

Appendix 1.7 Geology of Kenya

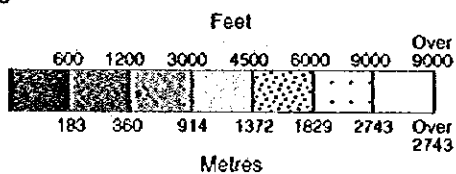


Source : Survey of Kenya (1970)

Appendix 1.8 Topography of Kenya

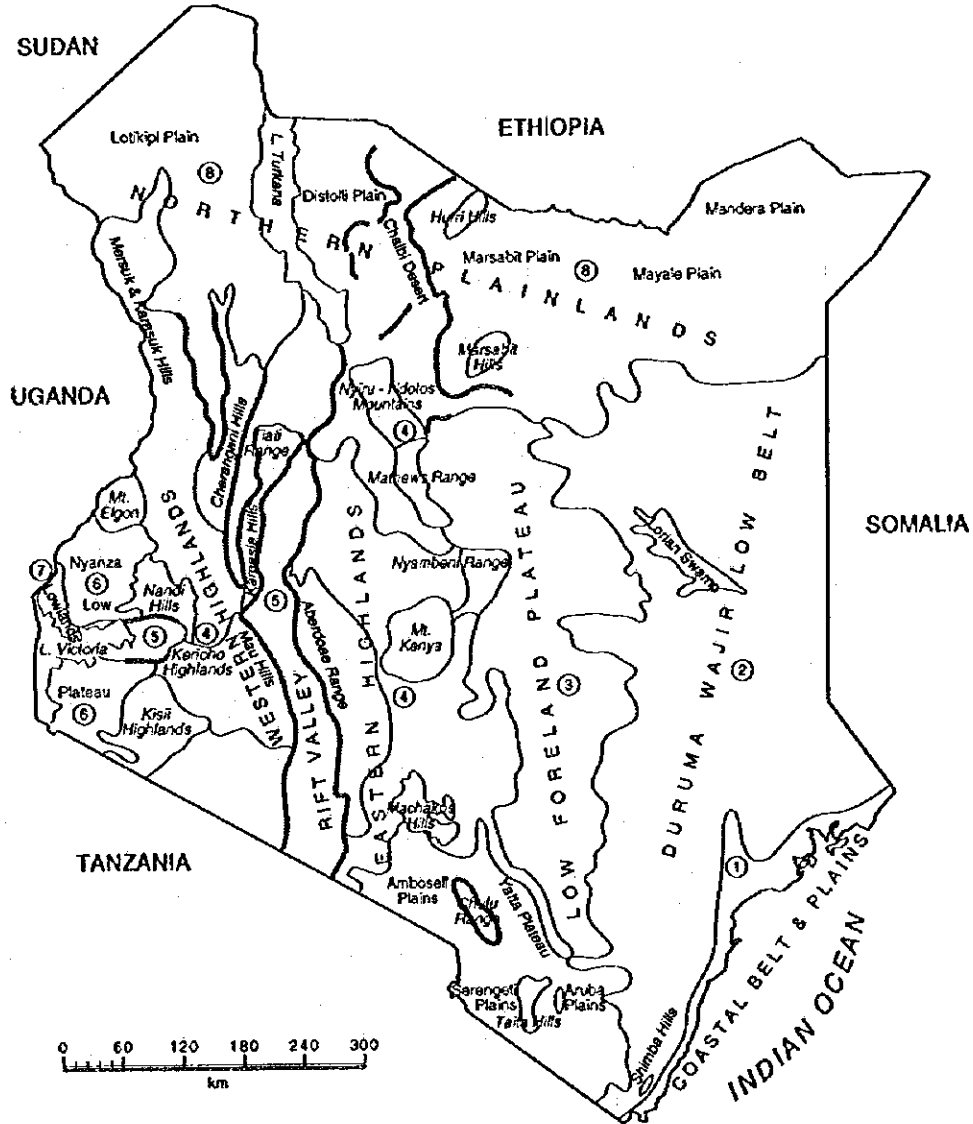


Legend :



Source : Ministry of Water Development / JICA 1992

Appendix 1.9 Physiographic Regions of Kenya

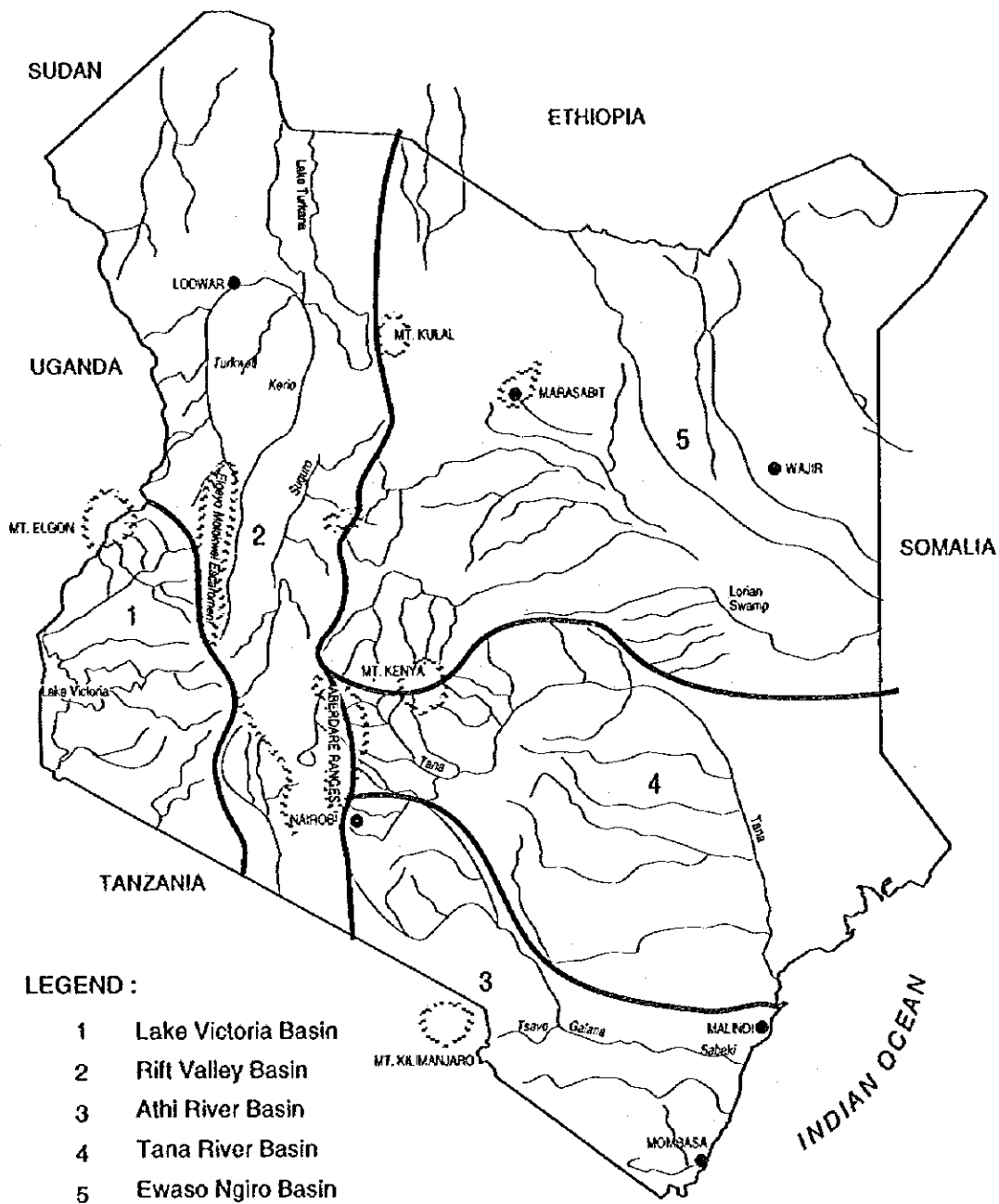


Legend :

1. Coastal Belt and Plain
2. Duruma - Wajir Low Belt
3. Low Foreland Plateau
4. Kenya Highlands (Western and Eastern Highlands)
5. Kenya Rift Valley
6. Nyanza Low Plateau
7. Nyanza Lowlands
8. Northern Plainland

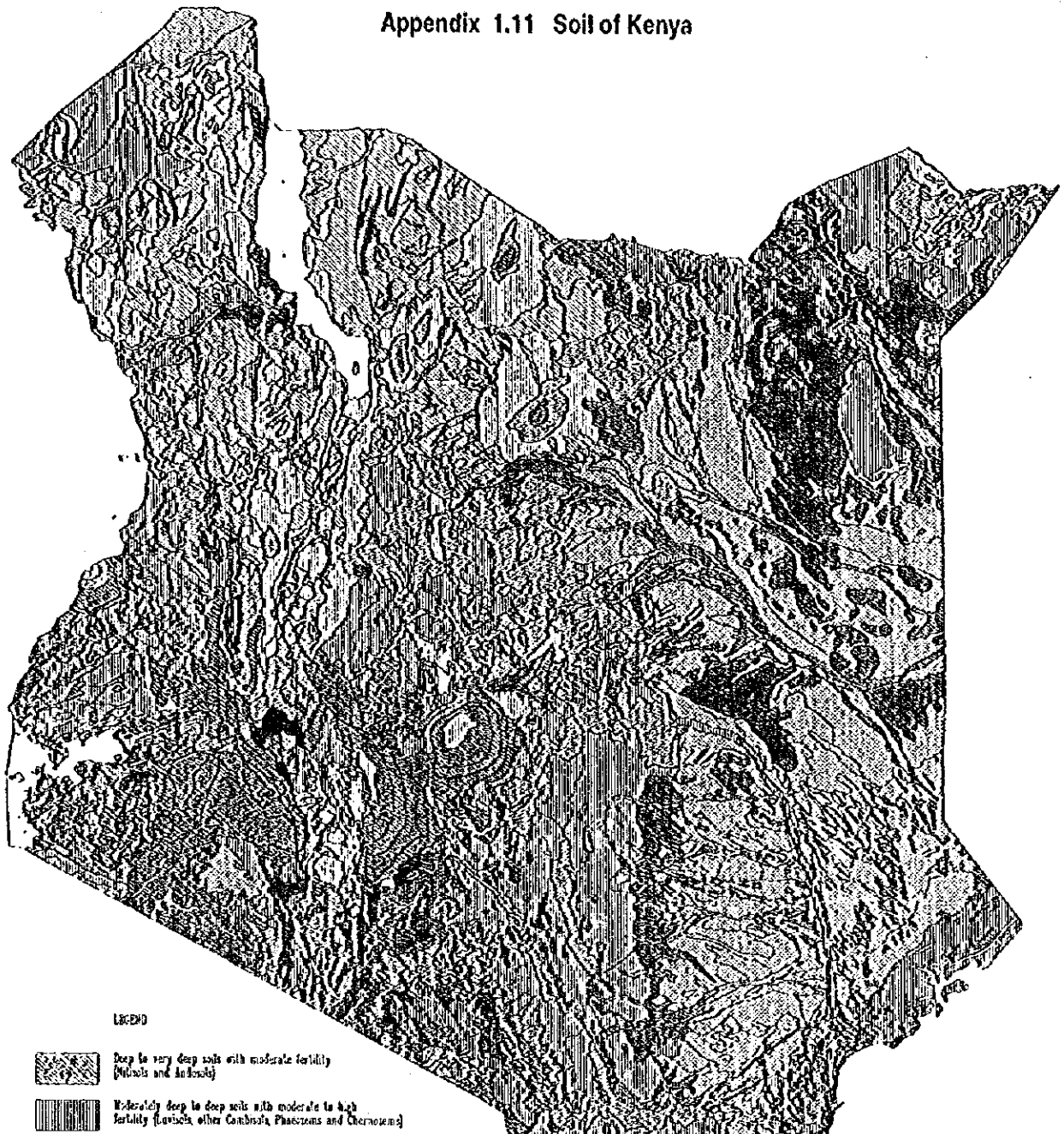
Source : Ministry of Water Development / JICA (1992)

Appendix 1.10 Major Drainage Basins of Kenya













Source : Ministry of Water Development / JICA (1992)

Appendix 1.11 Soil of Kenya

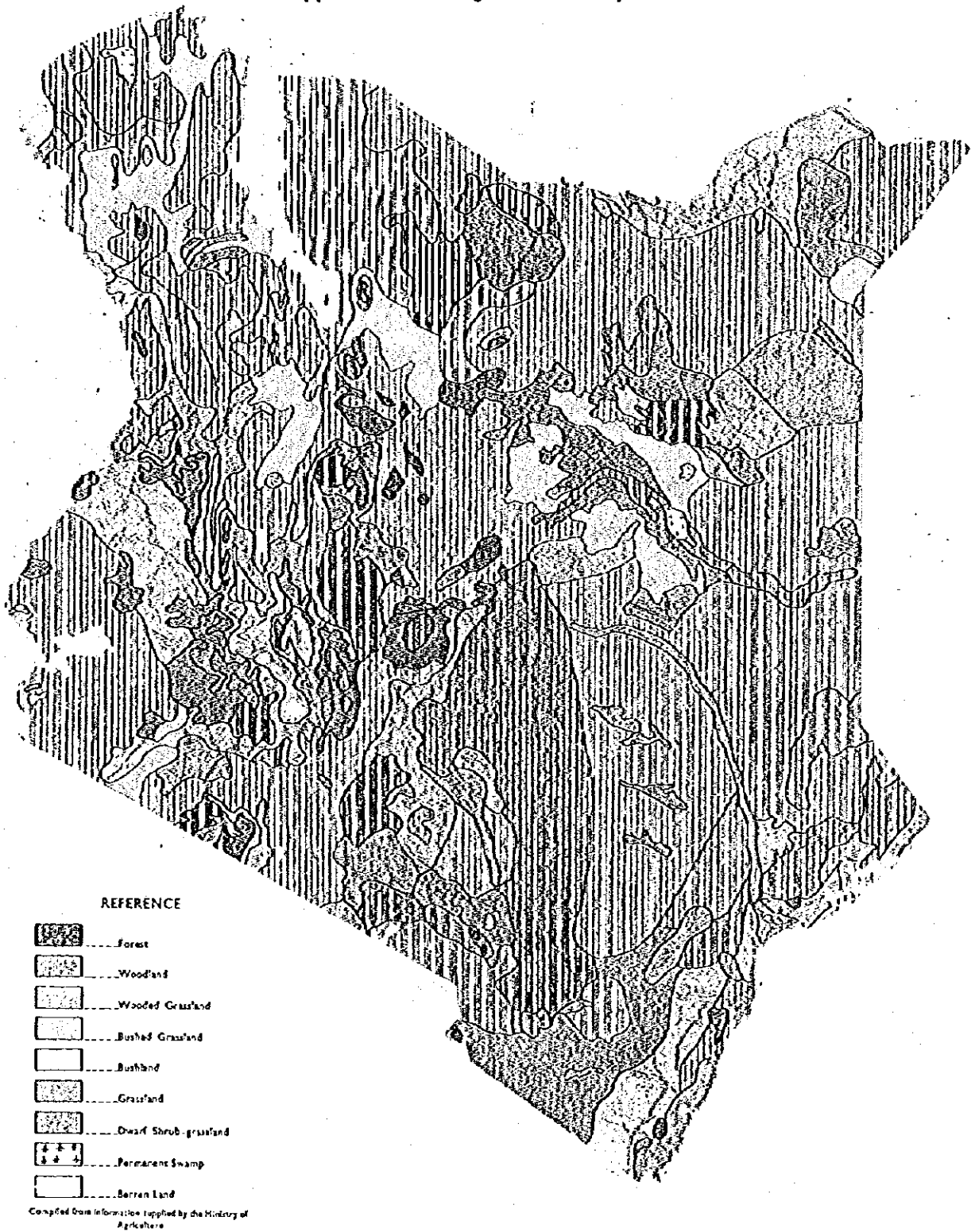


LEGEND

-  Deep to very deep soils with moderate fertility (Mollisols and Andisols)
-  Moderately deep to deep soils with moderate to high fertility (Luvisols, other Cambisols, Phaeozems and Chernozems)
-  Deep red, strongly weathered acid soils with low fertility (Parasols, Acrisols and Ferruginous soils)
-  Alluvial soils (Fluvisols)
-  Shallow to moderately deep soils with high fertility (Shallow Cambisols, Luvisols and Phaeozems)
-  Shallow and/or juvenile soils (Alfisols, Regisols, Entisols and Rendzinas)
-  Very developed soils of the arid region (Torrisols and Vertisols)
-  Sandy soils (Arenisols)
-  Poorly drained, moderately deep to deep clay soils (Vertisols, Gleysols, Planosols, Gypsisols, Chernozems and vertic Luvisols, Phaeozems)
-  Saline and Sodic soils (Solonchaks, Solonchaks and Planosols)

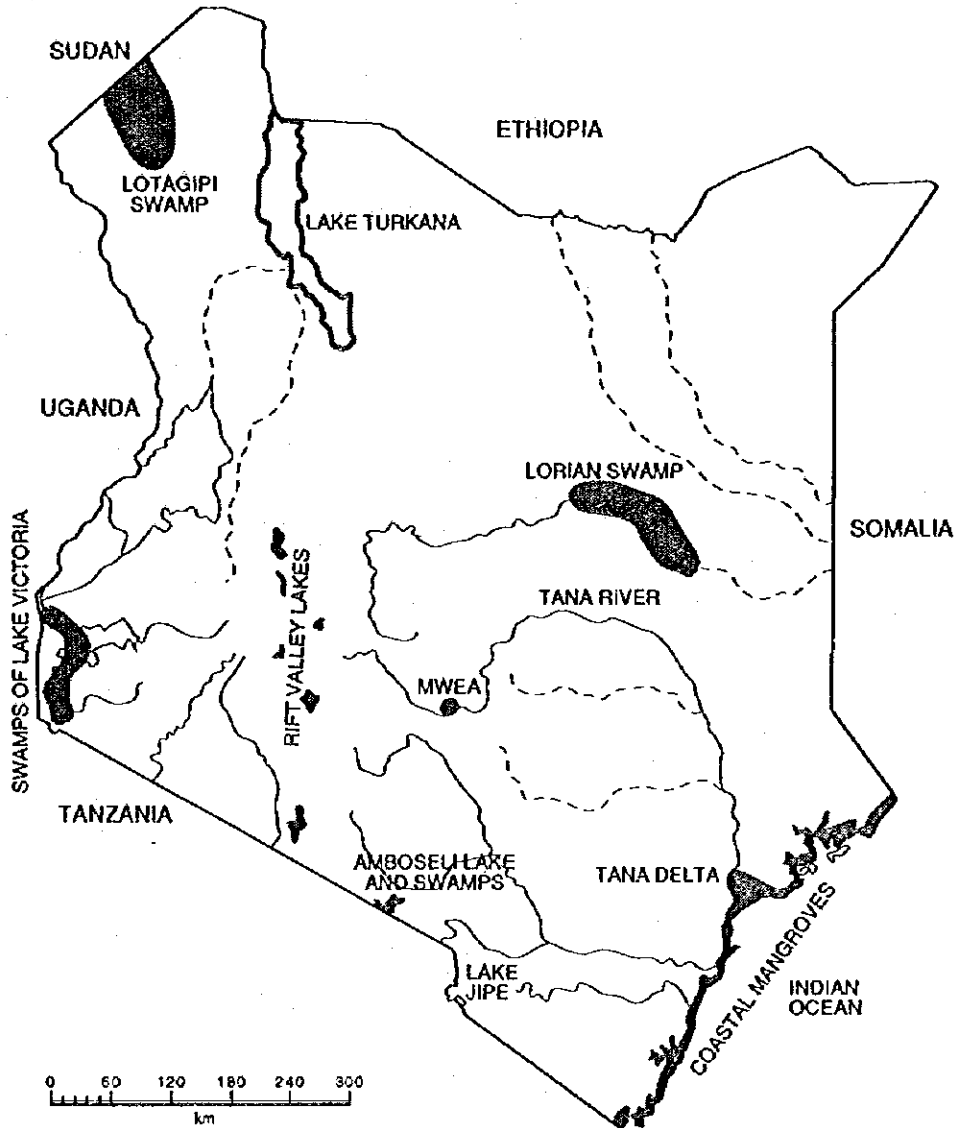
Source : Kenya Soil Survey (1982)

Appendix 1.12 Vegetation of Kenya



Source : Survey of Kenya (1970)

Appendix 1.13 Major Wetland of Kenya



Legend :

 Major Wetlands

Source : S.A. Crafter, S.G. Njuguna and G.W. Howard, IUCN (1992)

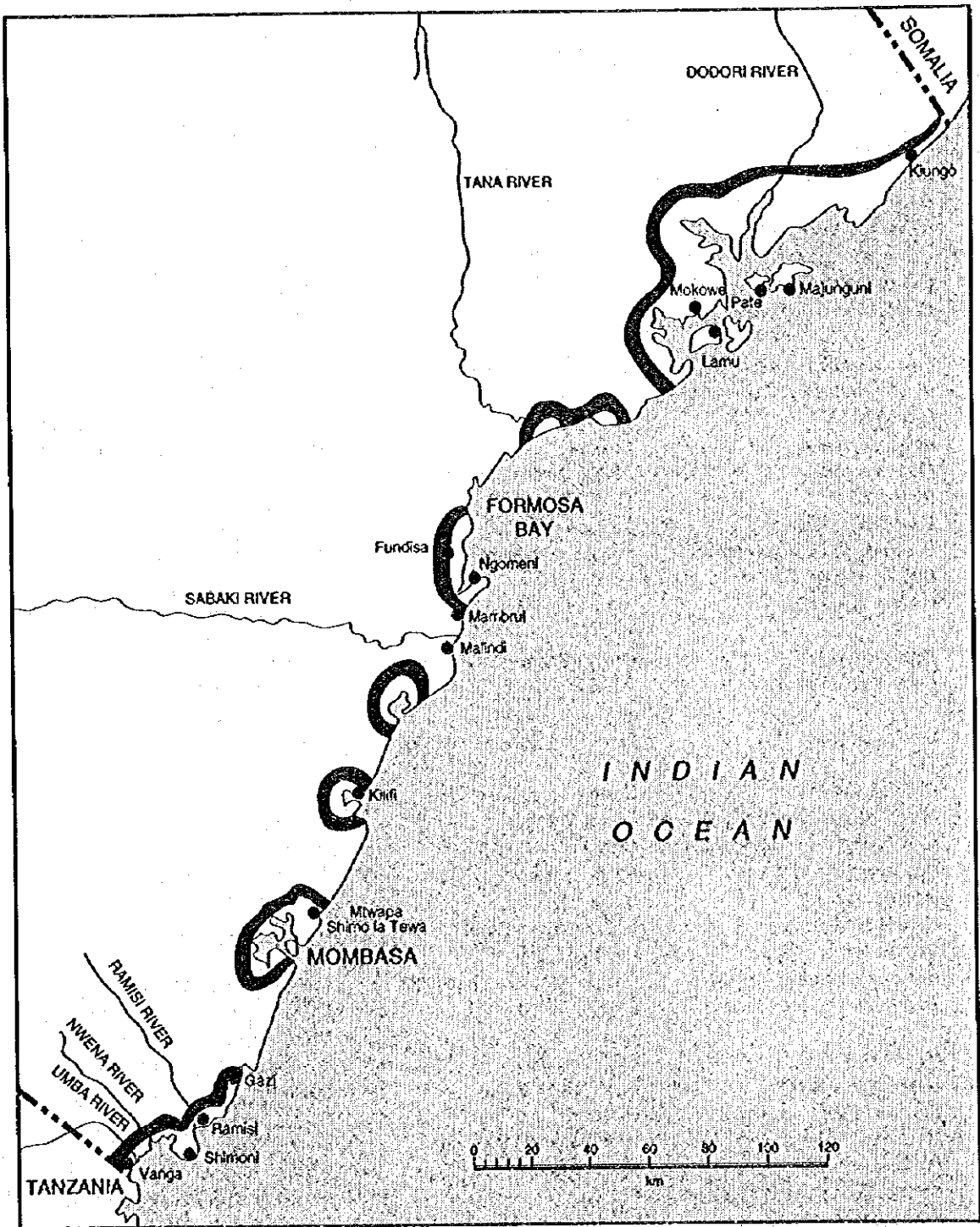
**Appendix 1.14 Diversity of Animal Species and Plant Taxa in Kenya
and Other African Countries with Rich Fauna and Flora**




Countries	Mammals	Birds	Reptiles	Amphibians	Plants
Kenya	309 (17)	1,067 (18)	187 (2)	88 (0)	6,500 (144)
Angola	276 (14)	872 (12)	- (2)	- (0)	5,000 (19)
Cameroon	297 (27)	848 (17)	- (2)	- (1)	8,000 (74)
Ethiopia	255 (25)	836 (14)	- (1)	- (0)	6,283 (44)
Nigeria	274 (25)	831 (10)	100 (2)	60 (0)	4,614 (9)
South Africa	247 (25)	774 (13)	299 (3)	95 (1)	23,000 (1,016)
Sudan	267 (17)	938 (8)	- (1)	- (0)	3,200 (9)
Tanzania	306 (30)	1,016 (26)	245 (3)	121 (0)	10,000 (158)
Uganda	315 (16)	989 (12)	119 (1)	44 (0)	5,000 (11)
Zaire	415 (31)	1,086 (27)	- (2)	- (0)	11,000 (3)

Notes: Numbers of species/taxa known and numbers of threatened species/taxa in parentheses.
Only species level is accounted for in animals but also taxa below species level in plants.
"Threatened" includes all of IUCN categories: Endangered, Vulnerable, Rare, Indeterminate and Insufficiently Known.

Source: UNEP Environmental Data Report 1993-94, UNEP (1993)

Appendix 1.15 Distribution of Mangrove Forests along the Kenya's Coastal line



- Legend :**
-  Mangrove Forests
 -  Boundary
 -  River

Source : The National Biodiversity Unit with financial assistance from The Overseas Development Administration, UK (1992)

Appendix 1.16 (1) List of Threatened and Endemic Animal Species in Kenya by IUCN Categories (1994)

IUCN	Scientific Name	Common Name	Distribution
	[MAMMALS]		
K	<i>Crocidura monax</i>	(White-toothed Shrew)	Southern Region
K *	<i>Crocidura raineyi</i> (<i>C. luna raineyi</i>)	(White-toothed Shrew)	Central Region
V	<i>Myonycteris relicta</i>	East African Collared Fruit Bat	South-eastern Region
K	<i>Galagoides thomasi</i> (<i>G. demidoff thomasi</i>)	Thomas's Galago	Coastal forest
V	<i>Galagoides zanzibaricus</i> (<i>G. senegalensis zanzibaricus</i>)	Zanzibar Galago	Southern Coast, Tana River
E (*)	<i>Cerecocebus galeritus galeritus</i>	Tana River Mangabey	Tana River
+	<i>Cercopithecus mitis albitorquatus</i>	Syke's Monkey	Northern Coast
+	<i>Cercopithecus neglectus</i>	De Brazza's Monkey	Kakamega Forest, Saiwa Swamp NP, Tana River
V *	<i>Procolobus badius rufomitratu</i> (<i>P. rufomitratu/P.r. rufomitratu</i>)	Tana River Colobus	Tana River
E	<i>Lycaon pictus</i>	Wild Dog	Masai Mara NR, Tsavo East/West NPs, etc.
V	<i>Acinonyx jubatus</i>	Cheetah	Masai Mara NR, Tsavo East/West NPs, etc.
K	<i>Profelis aurata</i> (<i>Felis aurata</i>)	African Golden Cat	Western forest
K	<i>Bdeogale jacksoni</i>	Jackson's Mongoose	Central Region
E	<i>Bdeogale crassicauda omnivora</i>	Sokoke Bushy-tailed Mongoose	Arabuko Sokoke Forest
V	<i>Dugong dugon</i>	Dugong	Marine
V	<i>Loxodonta africana</i>	African Elephant	Masai Mara NR, Tsavo East/West NPs, Amboseli NP, Aberdare NP, etc.
E	<i>Equus grevyi</i>	Grevy's Zebra	North-eastern arid land
V	<i>Ceratotherium simum</i>	White Rhinoceros	Lake Nakuru NP, Masai Mara NR, etc. (Re-introduced)
E	<i>Diceros bicornis</i>	Black Rhinoceros	Lake Nakuru NP, Aberdare NP, Nairobi NP, Masai Mara NR, etc.
I	<i>Dendrohyrax validus</i>	Eastern Tree Hyrax	Southern Coast
V	<i>Phacochoerus aethiopicus delamerei</i>	Somali Warthog	Northern Region
+	<i>Hylochoerus meinertzhageni</i>	Giant Forest Hog	Central forest
V	<i>Cephalophus adersi</i>	Aders' Duiker	Arabuko Sokoke Forest
E	<i>Damaliscus hunteri</i>	Hirola	Tsavo East NP, Arawale NR
V	<i>Gazella soemmerringii</i>	Soemmerring's Gazelle	North-eastern Region
V	<i>Ourebia ourebi haggardi</i>	Haggard's Oribi	Boni NR, Dodori NR
V	<i>Redunca fulvorufula chanleri</i>	Chanler's Mountain Reedbuck	Nairobi NP, Masai Mara NR
V *	<i>Tragelaphus eurycerus isaaci</i>	Eastern Bongo	Mt. Kenya, Aberdare Mountains, Mau Forest (?)
+	<i>Hippotragus niger</i>	Sable Antelope	Shimba Hills NR, Lunga lunga
+	<i>Hippotragus equinus</i>	Roan Antelope	Ruma NP
V	<i>Beamys hindel</i>	Lesser Hamster-rat	Coast
K	<i>Mastomys pernanus</i>	(Multimammate Rat)	South-western Region
V	<i>Pelomys hopkinsi</i>	(Groove-toothed Creek Rat)	Western Region
(*)	<i>Chrysochloris stuhlmanni fosteri</i>	Golden Mole	Mt. Elgon, Cherangani Mountains
V *	<i>Rhynchocyon chrysopygus</i>	Golden-rumped Elephant-shrew	Arabuko Sokoke Forest
R	<i>Rhynchocyon petersi</i>	Black & Rufous Elephant-shrew	Southern Coast
K *	<i>Petrodromus tetradactylus sangi</i>	Four-toed Elephant-shrew	Eastern Coast
+	<i>Myosorex norae</i>	(Kenya Mole-shrew)	Aberdare Mountains
+	<i>Myosorex polulus</i>	(Kenya Mole-shrew)	Mt. Kenya

Appendix 1.16 (2) List of Threatened and Endemic Animal Species in Kenya by IUCN Categories (1994)

IUCN	Scientific Name	Common Name	Distribution
[BIRDS]			
R	<i>Falco naumanni</i>	Lesser Kestrel	(Palearctic migrant)
*	<i>Francolinus jacksoni</i>	Jackson's Francolin	Western/Central montane forest
R	<i>Crex crex</i>	Corn Crane	(Palearctic migrant)
E (*)	<i>Otus ireneae</i>	Sokoke Scops-owl	Arabuko Sokoke Forest
*	<i>Phoeniculus granti</i>	Violet Wood Hoopoe	Eastern riverine woodland
*	<i>Mirafra williamsi</i>	William's Bush Lark	Northern arid land
V (*)	<i>Anthus sokokensis</i>	Sokoke Pipit	Coastal forest
I	<i>Malaconotus montei</i>	Monteiro's Bushshrike	Kakamega Forest (?)
K	<i>Apalis charyessa</i>	White-winged Apalis	Tana River
*	<i>Apalis thoracita fascicularis</i>	Taita Bar-throated Apalis	Taita Hills
R	<i>Chloropeta gracilirostris</i>	Thin-billed Flycatcher-warbler	Swamps
K (*)	<i>Cisticola restrictus</i>	Tana River Cisticola	Tana River
*	<i>Cisticola aberdare</i>	Aberdare Cisticola	Western/Central montane grassland
*	<i>Zosterops poliogastra silvanus</i>	Taita Montane White-eye	Taita Hills
*	<i>Macronyx sharpei</i>	Sharpe's Longclaw	Central montane grassland
R	<i>Eremomela turneri</i>	Turner's Eremomela	Kakamega Forest
R	<i>Muscicapa lendu</i>	Chapin's Aseonax	Kakamega Forest, North Nandi Forest
R	<i>Sheppardia gunningi</i> (<i>Erihacus gunningi</i>)	East Coast Akalat	Coastal forest
V *	<i>Turdoides hindei</i>		South-central small valleys
*	<i>Andropadus ansorgei kavirondensis</i>	Ansorge's Greenbul	Kakamega Forest
R	<i>Zoothera guttata</i>	Spotted Ground-thrush	Coastal forest (Intra-African migrant)
E *	<i>Turdus olivaceus helleri</i> (<i>T.helleri</i>)	Taita Thrush	Taita Hills
R	<i>Anthreptes pallidigaster</i>	Amani Sunbird	Coastal forest
E *	<i>Ploceus golandi</i>	Clarke's Weaver	Arabuko Sokoke Forest
K	<i>Cinnyricinclus femoralis</i>	Abbott's Starling	Central/South-eastern montane forest
[REPTILES]			
K	<i>Malacochersus tornieri</i>	Pancake Tortoise	Arid land
E	<i>Chelonia mydas</i>	Green Turtle	Marine
E	<i>Eretmochelys imbricata</i>	Hawksbill Turtle	Marine
E	<i>Lepidochelys olivacea</i>	Olive Ridley	Marine
*	<i>Chamaeleo fisheri excubitor</i>	Mt. Kenya Hornless Chameleon	Mt. Kenya
*	<i>Chamaeleo fisheri tavetanus</i>	Two-horned Chameleon	Taita Hills
*	<i>Chamaeleo jacksonii xantholopus</i>	Mt. Kenya Three-horned Chameleon	Mt. Kenya
*	<i>Acontias percivali</i>	Taita Mountain Limbless Skink	Mt. Mbololo, Taita Hills
*	<i>Coluberu keniensis</i>	Lake Baringo Snake	Lake Baringo
*	<i>Vipera hindii</i>	Montane Viper	Mt. Kenya, Aberdare Mountains
*	<i>Atheris desaixi</i>	Mt. Kenya Bush Viper	Mt. Kenya, Nyambeni Forest
*	<i>Bitis worthingtoni</i>	Kenya Horned Viper	Naivasha, Njoro, Kipkabus, etc.
[AMPHIBIANS]			
*	<i>Hyperolius cystocandicans</i>		Mau Escarpment, Nyachururu, Limuru, etc.
*	<i>Hyperolius montanus</i>		Mt. Kinangop, Aberdare Mountains, Mau Escarpment, Molo
*	<i>Hyperolius rubrovermiculatus</i>		Shimba Hills
*	<i>Hyperolius sheldicki</i>		Galana River, Tsavo East NP, Kakoneni
*	<i>Arixalus sylvaticus</i>		Kwale
*	<i>Arixalus pygamaeus</i>		Voi, Mito Andei
*	<i>Arthropleptides dutoti</i>		Mt. Elgon

Appendix 1.16 (3) List of Threatened and Endemic Animal Species in Kenya by IUCN Categories (1994)

IUCN	Scientific Name	Common Name	Distribution
*	<i>Phrynobatrachus kinangopensi</i>		Kinangop Plateau, Aberdare Mountains
*	<i>Afrocaecilia changamwensis</i>		Changamwe, Mombasa
*	<i>Afrocaecilia taitana</i>		Taita Hills
	[FISHES]⊙		
I (*)	<i>Haplochromine spp. (>250 spp.)#</i>	Lake Victoria cichlid fishes	Lake Victoria
I (*)	<i>Tilapiine spp. (2 spp.)#</i>	Lake Victoria cichlid fishes	Lake Victoria
R *	<i>Oreochromis alcalicus grahami</i>	Lake Magadi Tilapia	Lake Magadi
	[INVERTEBRATES]		
K	<i>Tridacna maxima</i>	Small Giant Clam	Marine
I	<i>Tridacna squamosa</i>	Scaly Clam/Fluted Clam	Marine
V *	<i>Cymothoe teita</i>		?
I	<i>Euryphura achlys</i>	Mottled Green	?
*	<i>Mesobella kakamega</i>		Kakamega Forest
E *	<i>Papilio desmondi teita</i>	Taita Blue-banded Papilio	Taita Hills
I *	<i>Charaxes druceanus williamsi</i>		?
V *	<i>Charaxes xiphares desmondi</i>		?
*	<i>Mecostibus sellatus</i>		Emali

Note: E: Endangered, V: Vulnerable, R: Rare, I: Indeterminate, K: Insufficiently Known

: Endemic species, (): Probably/partly endemic species

+: Species for special conservation concern besides those listed on the 1994 IUCN Red List

⊙: >25 species of non-cichlid fishes inhabiting Lake Victoria, Lake Turkana and Tana River are also reported as endemic (The National Biodiversity Unit, 1992)

#: Species numbers inhabiting Lake Victoria including Tanzania and Uganda sides; 157ca. species of cichlid fishes are reported as endemic in Kenya side. Other >4 species of cichlid fishes inhabiting Lake Turkana and Tana River are also reported as endemic (The National Biodiversity Unit, 1992)

Source: 1994 IUCN Red List of Threatened Animals, IUCN (1993)

The Costs, Benefits and Unmet Needs of Biological Diversity Conservation in Kenya, Annex 2, Species Diversity (Animals), The National Biodiversity Unit (1992)

Antelopes, Global Survey and Regional Action Plans, Part 1, East and Northeast Africa, IUCN/SSC Antelope Specialist Group (1988)

Birds of East Africa, C.A.W. Guggisberg & M. Ellis (1990)

Appendix 1.17 Numbers of Threatened Animals Species in Kenya by IUCN Categories (1994)

Groups	E	V	R	I	K	TOTAL
Mammals	6	16	1	1	7	31
Birds	3	2	8	1	3	17
Reptiles	3	0	0	0	1	4
Amphibians	0	0	0	0	0	0
Fishes	0	0	1	>2*	0	>3
Invertebrates	1	2	0	3	1	7
TOTAL	13	20	10	7	12	62**

Notes: * excludes 252 species of cichlid fishes in Lake Victoria consisting of Kenya, Tanzania and Uganda sides

** includes 13 subspecies

E: Endangered, V: Vulnerable, R: Rare, I: Indeterminate, K: Insufficiently Known

Source: 1994 IUCN Red List of Threatened Animals, IUCN (1993)

Appendix 1.18 Population Trend of African Elephant and Black Rhinoceros in Kenya

Year	Elephant	B. Rhino
1970	-	20,000
1973	165,000	-
1977	80,000	-
1979	65,000	1,500
1981	65,056	1,028
1985	28,000	550
1987	23,000	521
1989	16,000	300
1990	20,000	390
1991	20,000	398
1992	26,550	414
1994	25,000	420

Sources: [Elephant]

I. Douglas-Hamilton (1979, 1989), Kenya Rangeland Ecological Monitoring Unit (1977),
 D.M.H. Cumming & P. Jackson (1984), R.B. Martin (1985),
 African Elephant and Rhino Specialist Group (1987), KWS (1991, 1994/95 information)

[B. Rhino]

African Elephant and Rhino Specialist Group (1987),
 D.H.M. Cumming & P. Jackson (1984),
 African Rhino Specialist Group (1991, 1992 lit.), KWS (1990, 1994/95 information)

Appendix 1.19 Population Trend of Large Ungulates with Three Groups

Groups/Species	1977	1985	1987	1989	1990	1991	1992	1993*
[Migratory]								
Wildebeest	179,829	93,400	67,600	87,900	100,200	114,200	120,100	186,400
Eland	49,221	26,800	17,000	25,500	31,300	38,400	32,500	16,700
Thomson's gazelle	172,269	183,900	107,100	101,400	98,700	96,000	89,200	53,500
Burchell's zebra	155,013	142,100	141,200	174,300	193,700	215,100	197,000	212,700
SUB-TOTAL	556,332	445,200	332,900	389,100	423,900	463,700	438,800	469,300
[Semi-migratory]								
Topi	89,055	81,600	102,500	107,300	109,800	112,300	107,700	103,500
Kongoni	39,092	24,200	19,600	22,000	23,300	24,700	26,000	23,500
Hirola	2,278	2,000	1,900	2,300	2,600	2,900	2,600	2,200
Oryx	65,599	41,500	25,500	33,300	38,100	43,500	35,600	34,200
Grant's gazelle	234,642	183,900	126,600	162,600	184,300	208,600	118,000	113,300
Grevy's zebra	13,858	7,000	4,300	5,500	6,200	7,000	7,200	6,000
SUB-TOTAL	444,524	340,100	280,400	333,000	364,300	399,000	297,100	282,700
[Sedentary]								
Giraffe	79,691	54,800	44,600	52,100	56,400	60,500	59,300	58,700
Buffalo	73,968	15,500	36,900	42,200	45,100	48,200	51,100	33,200
Kudus (lesser/greater)	18,106	6,900	7,600	11,000	13,200	15,900	14,100	13,200
Waterbuck	20,003	11,100	7,700	6,500	6,000	5,500	6,700	6,100
Gerenuk	49,707	24,800	24,600	23,500	23,000	22,500	24,400	24,300
Impala	179,936	122,000	111,400	106,800	104,500	102,300	110,800	85,700
SUB-TOTAL	421,311	235,100	232,700	242,100	248,200	254,900	266,400	221,200
TOTAL	1,422,167	1,021,400	846,000	964,200	1,036,400	1,117,600	1,002,300	973,200

Note: * data for 1993 is provisional source from DRSRS.

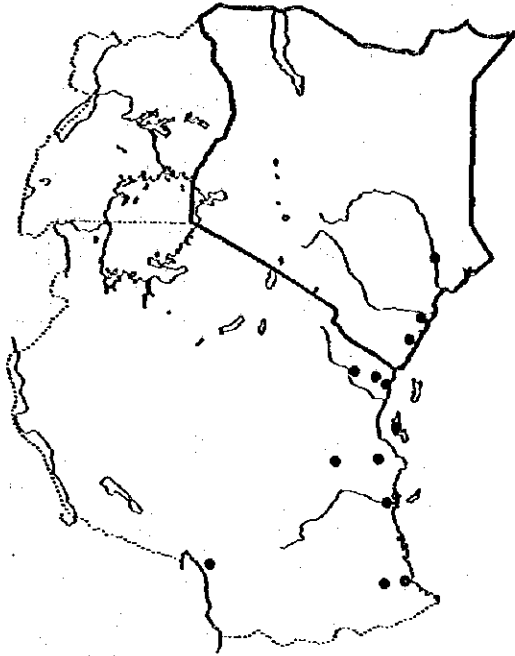
Sources: Dept. of Resource Surveys & Remote Sensing (1989), Kenya Economic Survey (1991, 1994)

Appendix 1.20 Population Trend of Livestock

Species	1977	1985	1987	1989
Cattle	4,088,703	11,500,000	12,073,000	13,433,000
Sheep/goats	6,965,660	15,000,000	14,972,000	13,886,000
Camels	635,816	600,000	956,000	800,000
Donkeys	139,904	300,000	249,000	2,000
TOTAL	11,830,083	27,400,000	28,250,000	28,121,000

Sources: Dept. of Resource Surveys & Remote Sensing (1989),
United Nations Environmental Programme (1987),
Min. of Reclamation and Development of Arid, Semi-arid Areas and Wastelands (1992),
The World Resources Institute (1992,1994)

Appendix 1.21 (I) Distribution of Threatened and Other Large Mammal Species in Kenya

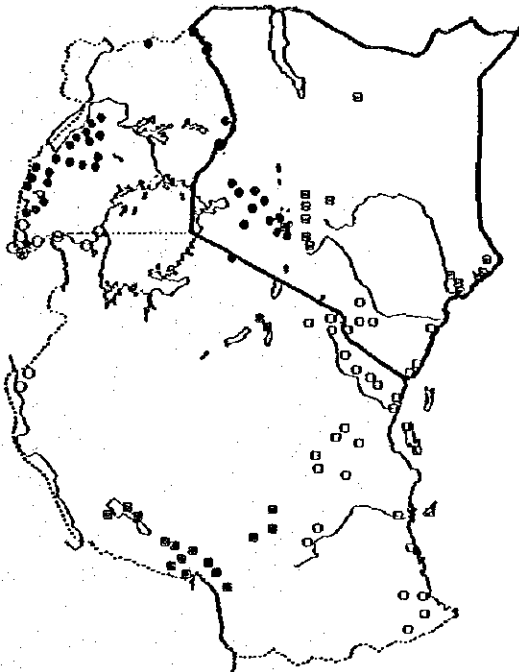


Zanzibar Galago * (a)



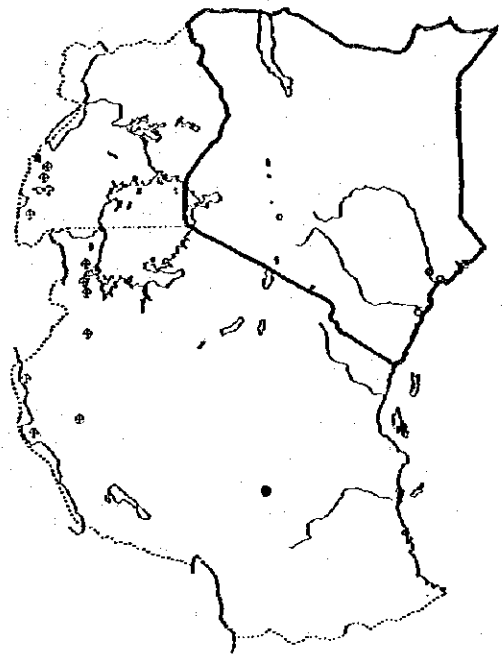
C. galeritus distribution.
* = *C. galeritus*.

Tana River Mangabey * (a)



white triangle in
white square = *C. m. albotorquatus*

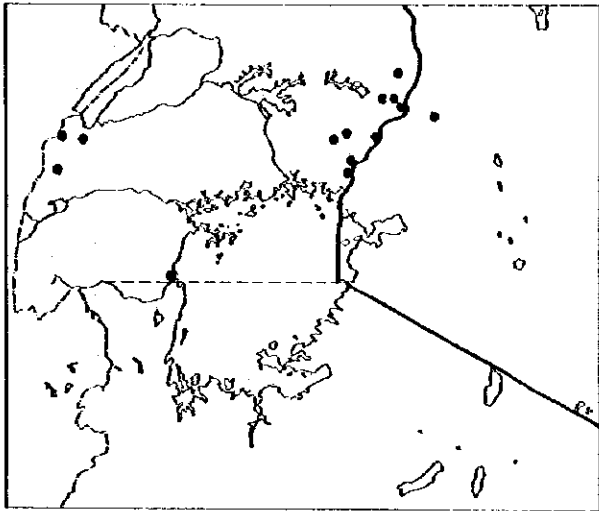
Syke's Monkey * (a)



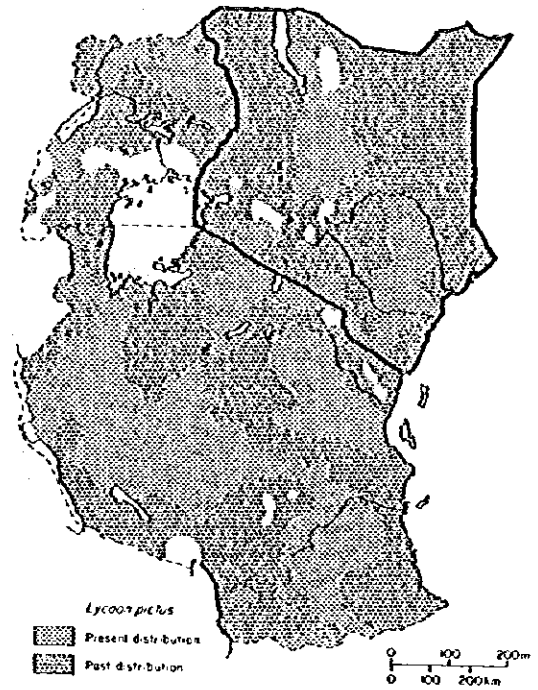
○ rufomitratu

Tana River Colobus * (a)

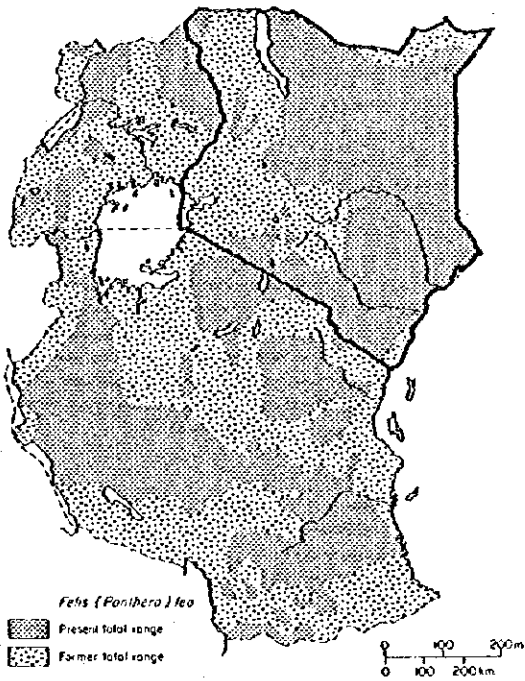
Appendix 1.21 (2) Distribution of Threatened and Other Large Mammal Species in Kenya



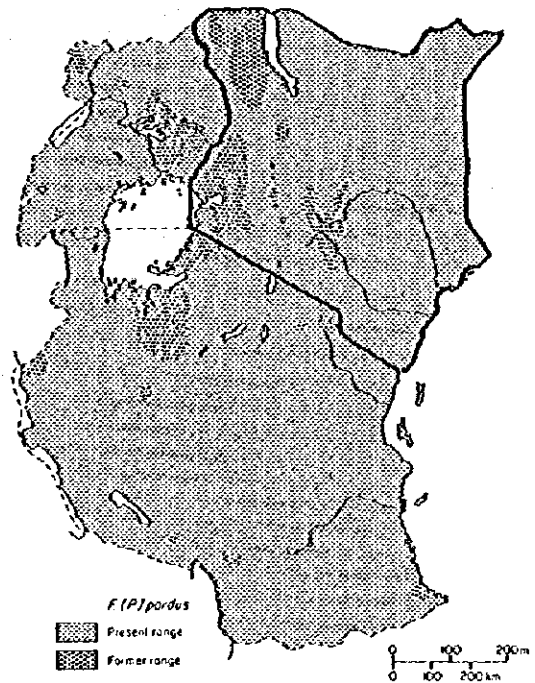
De Brazza's Monkey * (a)



Wild Dog * (a)

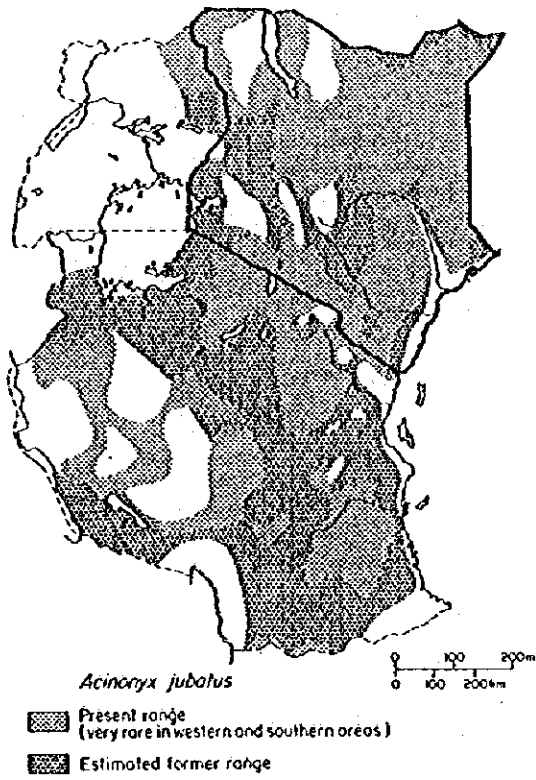


Lion (a)

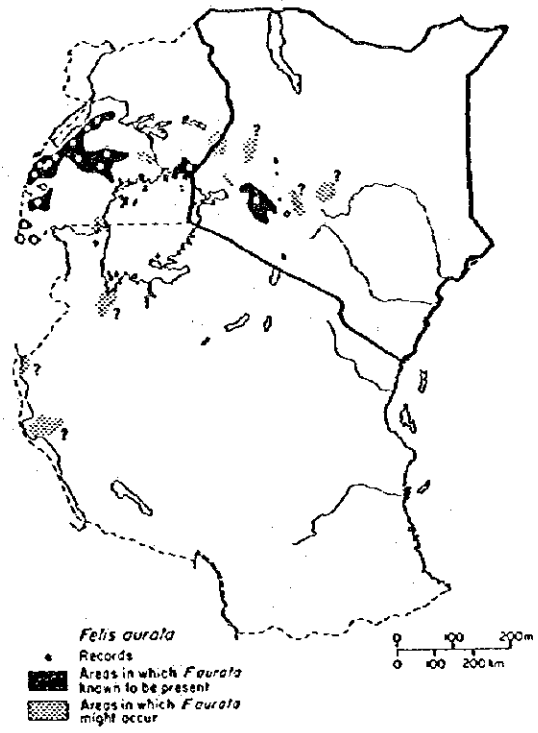


Leopard (a)

Appendix 1.21 (3) Distribution of Threatened and Other Large Mammal Species in Kenya



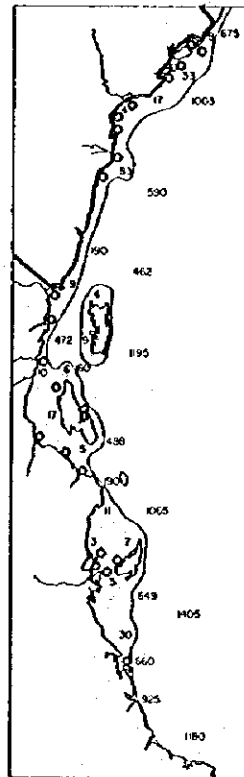
Cheetah * (a)



African Golden Cat * (a)

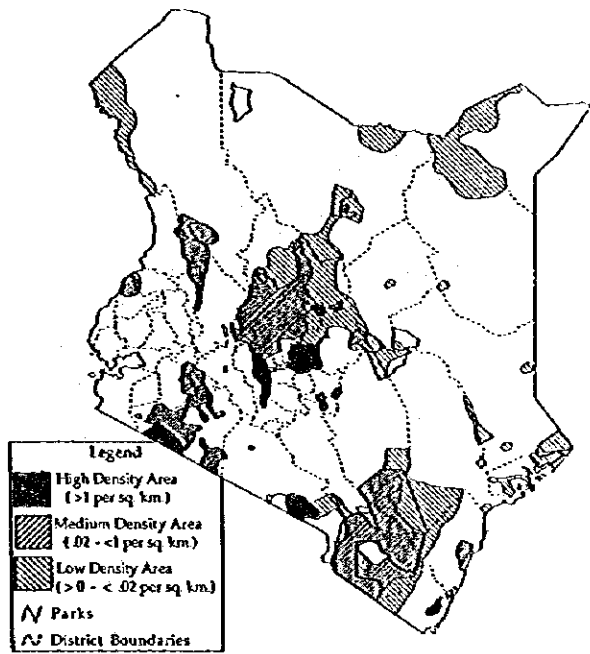


Sokoke Bushy-tailed Mongoose * (a)



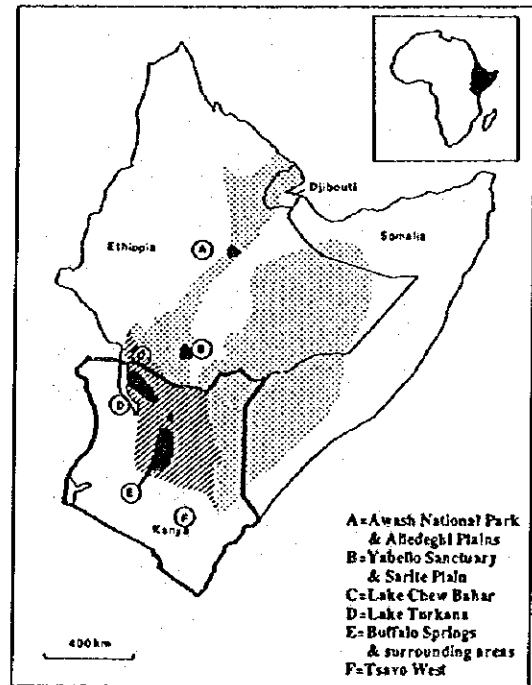
Dugong * (a)

Appendix 1.21 (4) Distribution of Threatened and Other Large Mammal Species In Kenya



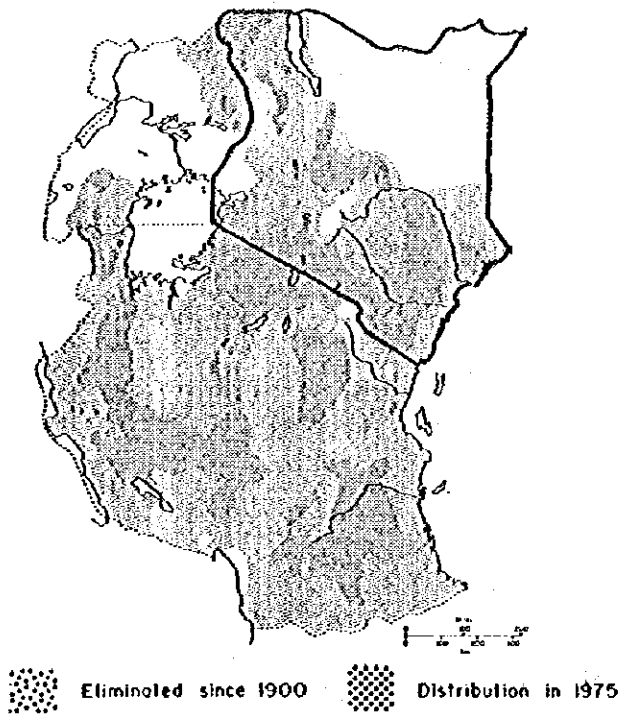
Density distribution map of Kenya's elephant population in 1992 based on KWS aerial surveys, forest surveys and wardens' reports. Prepared by: Ministry of Planning and National Development, Department of Resource Surveys and Remote Sensing (DRSRS), and Kenya Wildlife Service (KWS). Source of data: KWS, February, 1992.

African Elephant * (b)

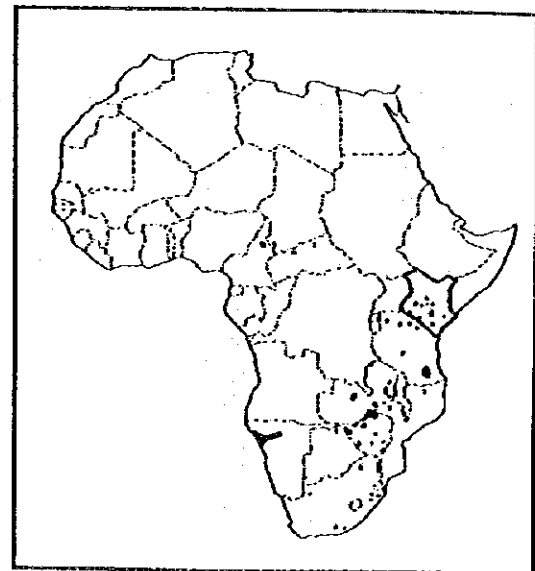


Distribution of Grevy's zebra in historical times (stippled, from Kingdon 1979, Yalden et al. 1986) and at present (hatched-rare, shaded-more abundant, after KREMU 1989, Ato Tadesse G. Michael and Ato Fekadu Kassaye in litt.).

Grevy's Zebra * (c)



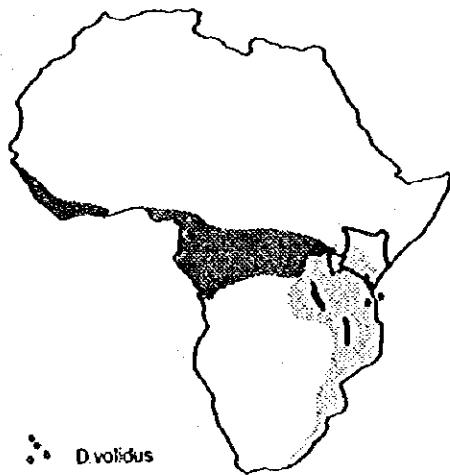
Burchell's Zebra (a)



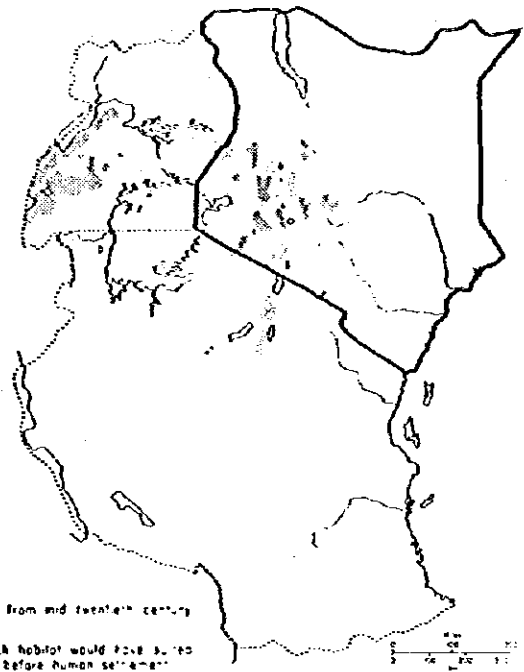
Distribution of the black rhinoceros in 1987 (adapted from Cumming 1987).

Black Rhinoceros * (d)

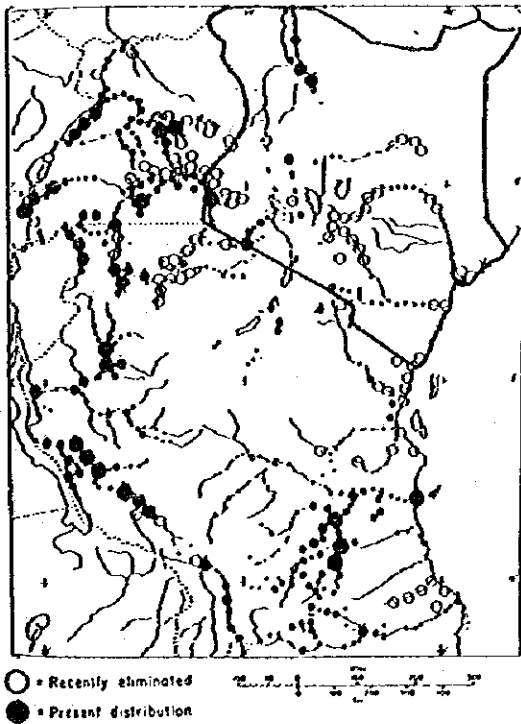
Appendix 1.21 (5) Distribution of Threatened and Other Large Mammal Species in Kenya



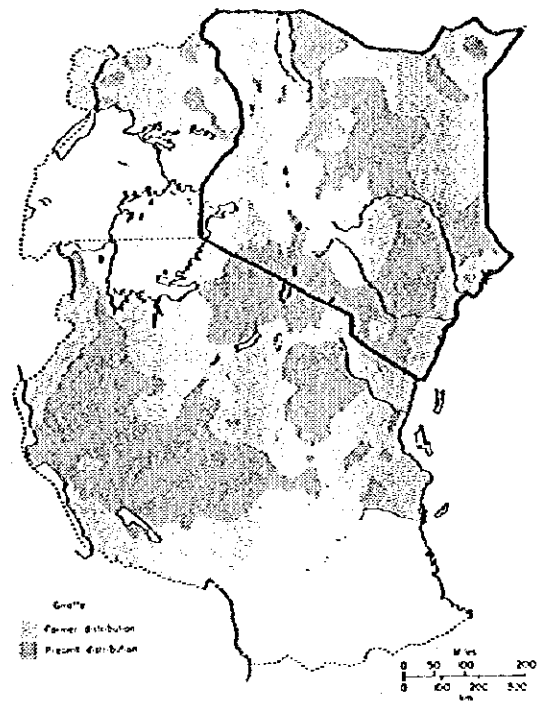
Eastern Tree Hyrax * (a)



Giant Forest Hog * (a)

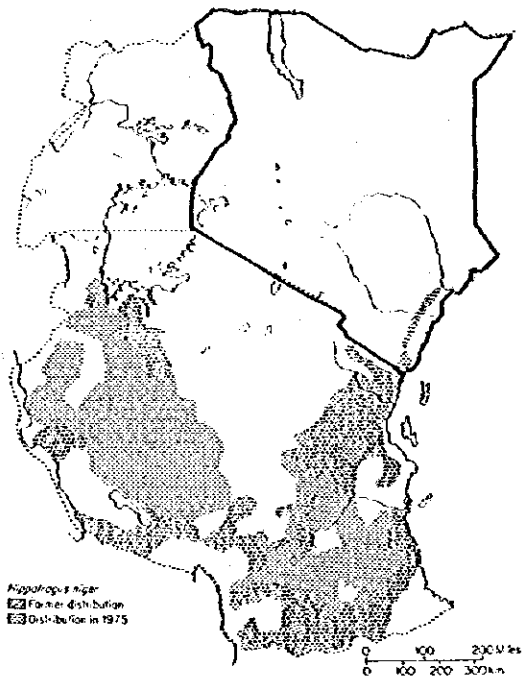


Hippopotamus (a)

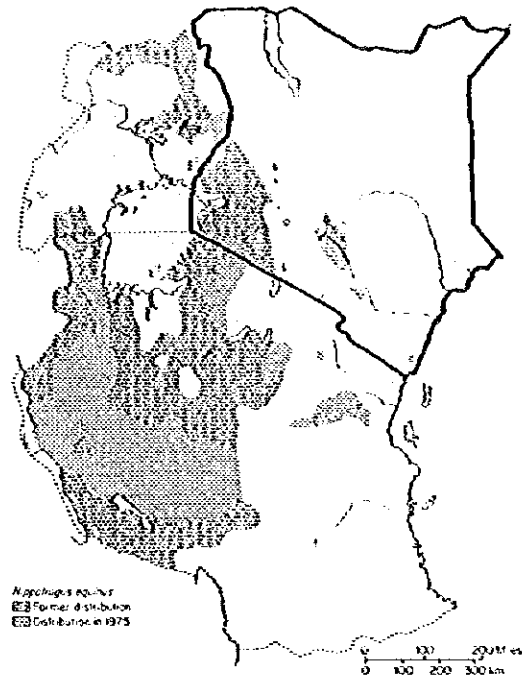


Giraffe (a)

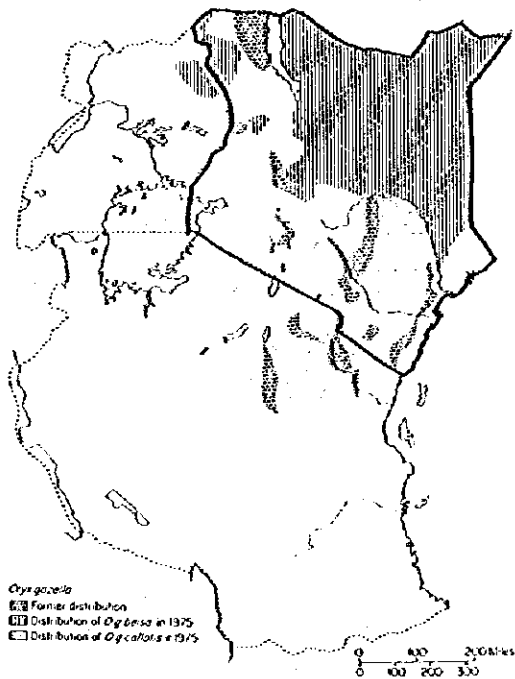
Appendix 1.21 (6) Distribution of Threatened and Other Large Mammal Species in Kenya



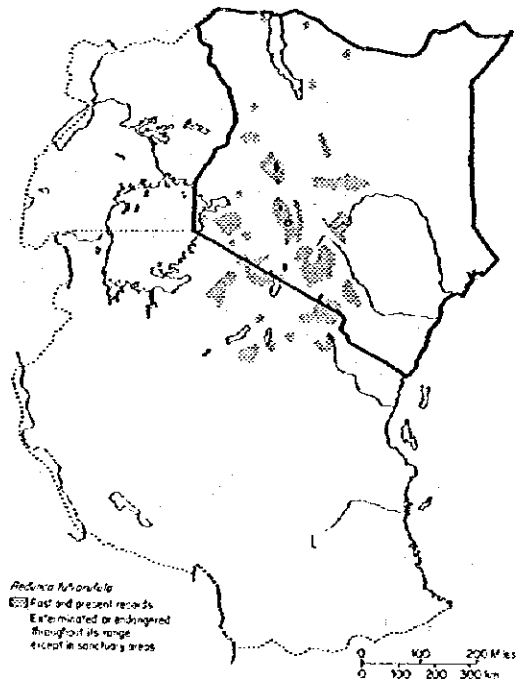
Sable Antelope * (a)



Roan Antelope * (a)

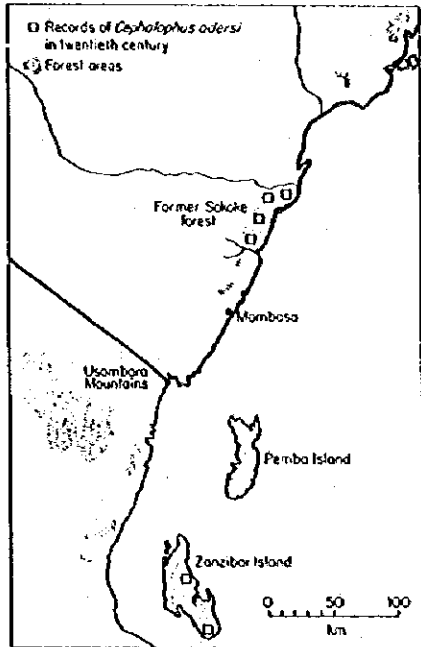


Oryx (a)

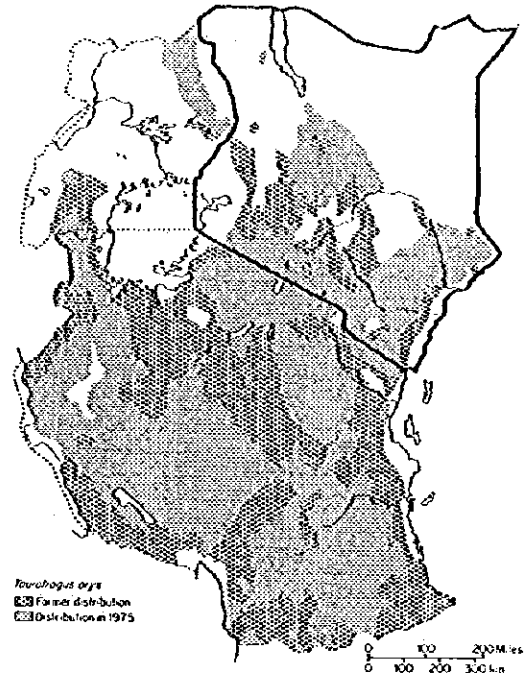


Chanler's Mountain Reedbuck * (a)

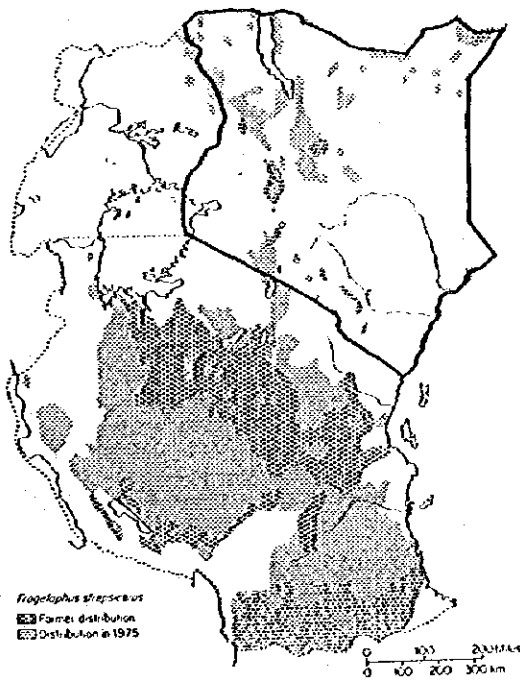
Appendix 1.21 (7) Distribution of Threatened and Other Large Mammal Species in Kenya



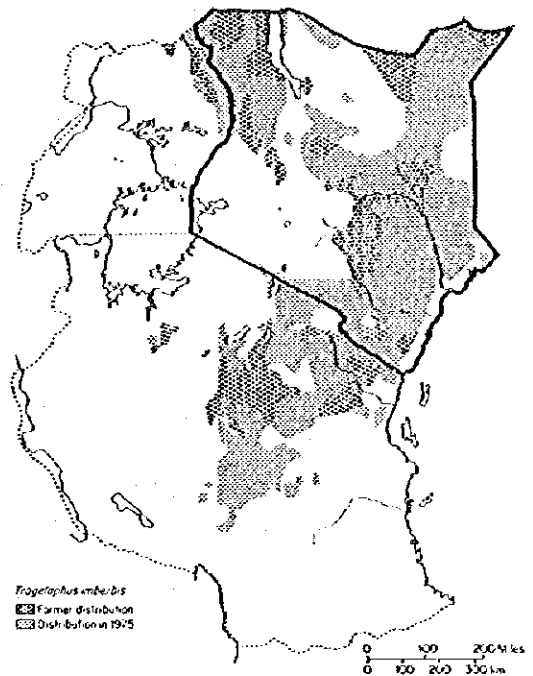
Aders' Duiker * (a)



Eland (a)

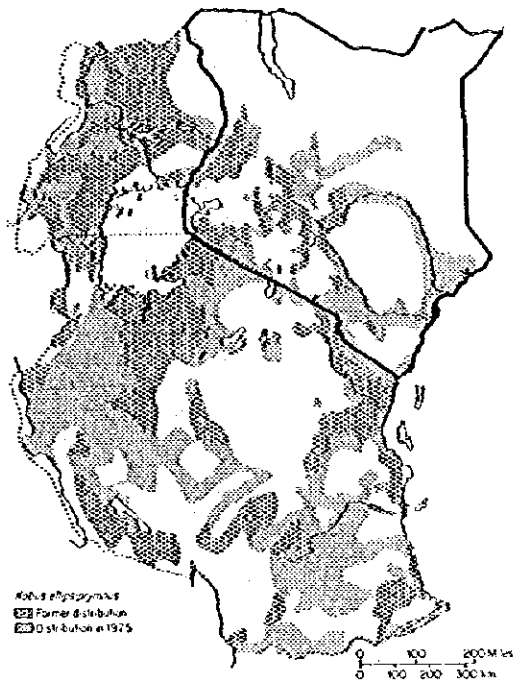


Greater Kudu (a)

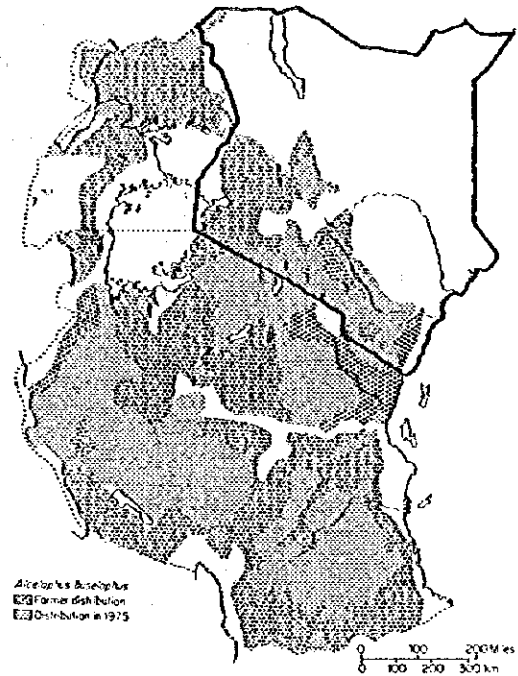


Lesser Kudu (a)

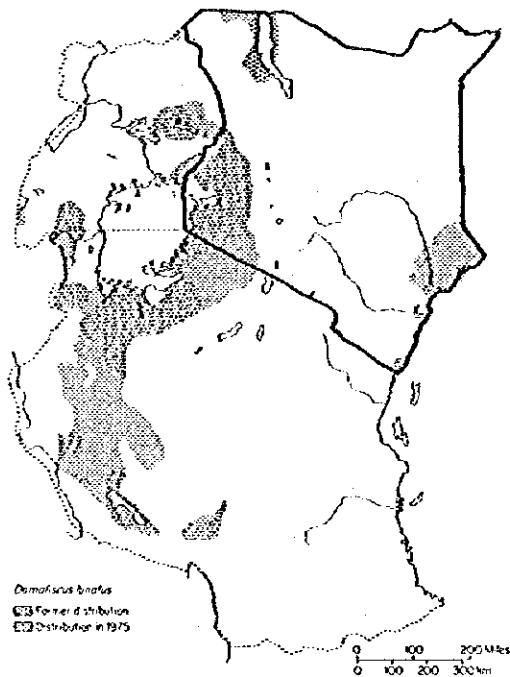
Appendix 1.21 (8) Distribution of Threatened and Other Large Mammal Species In Kenya



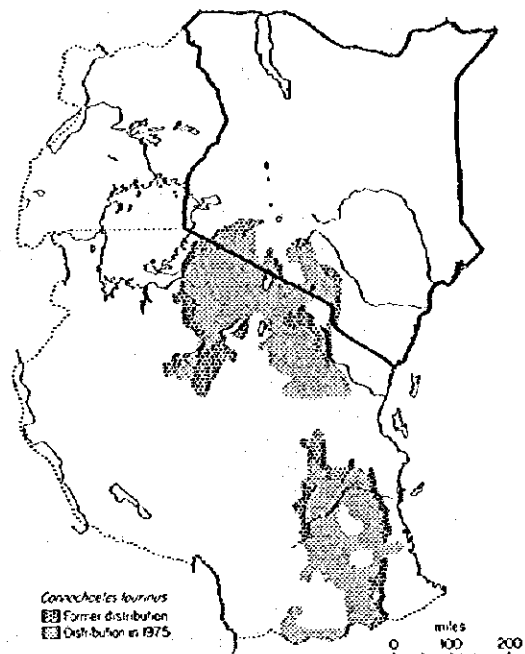
Waterbuck (a)



Hartebeest (a)

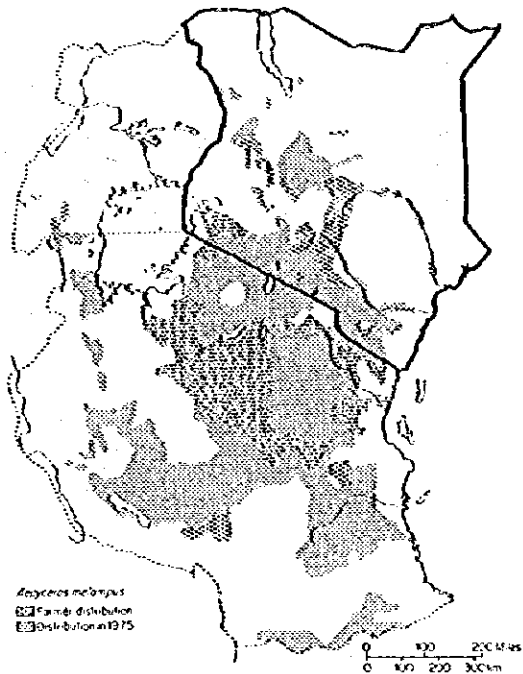


Topi (a)

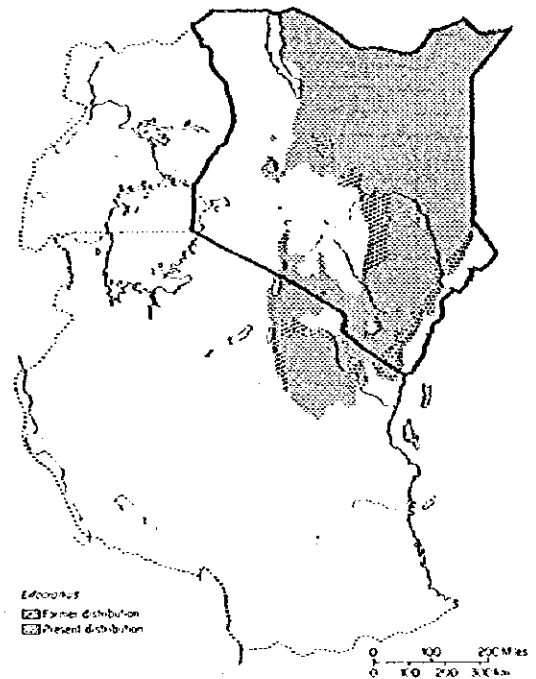


Wildebeest (a)

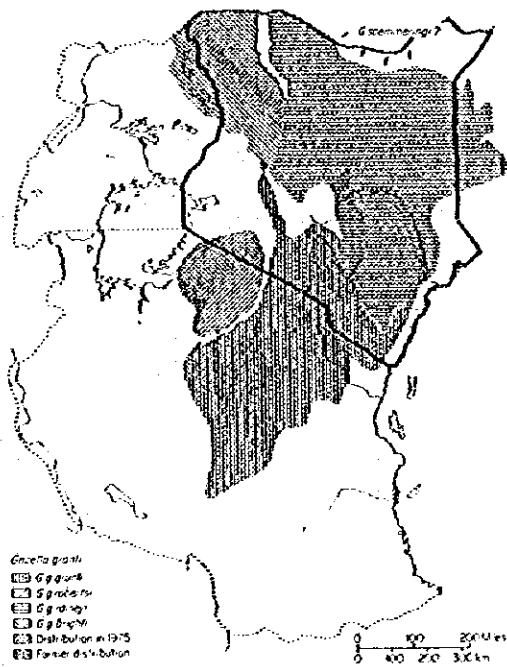
Appendix 1.21 (9) Distribution of Threatened and Other Large Mammal Species in Kenya



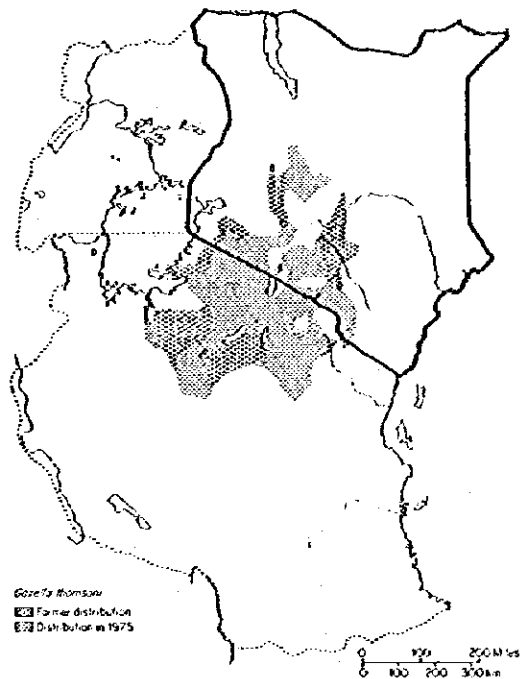
Impala (a)



Gerenuk (a)

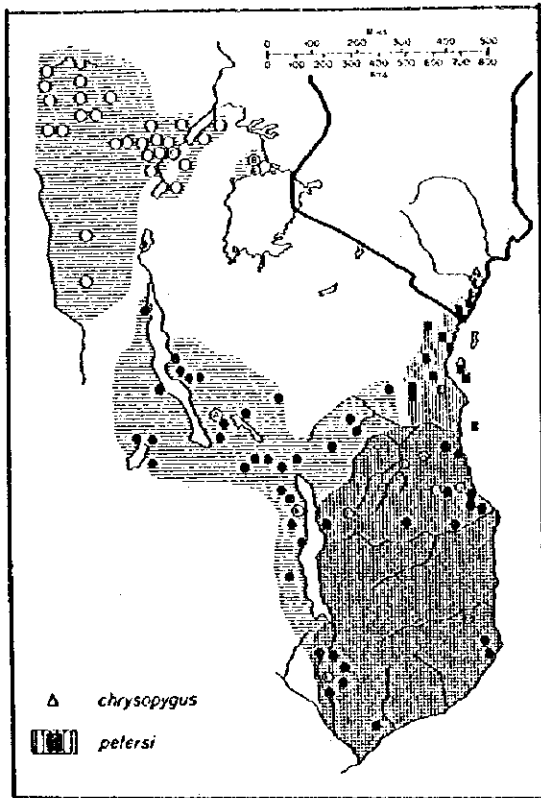


Grant's Gazelle (a)



Thomson's Gazelle (a)

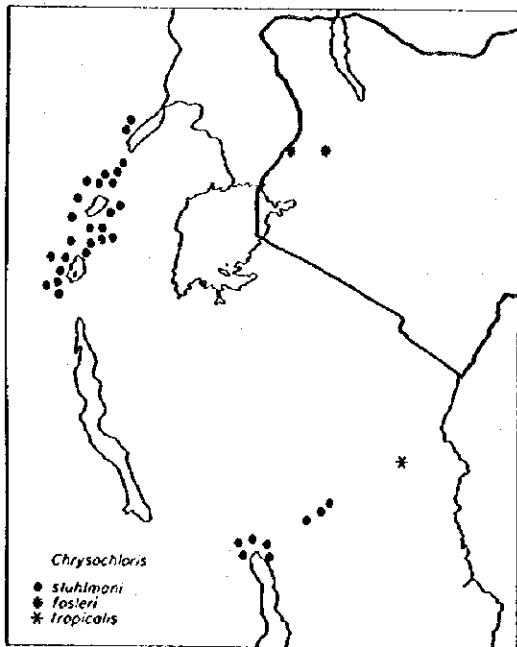
Appendix 1.21 (10) Distribution of Threatened and Other Large Mammal Species In Kenya



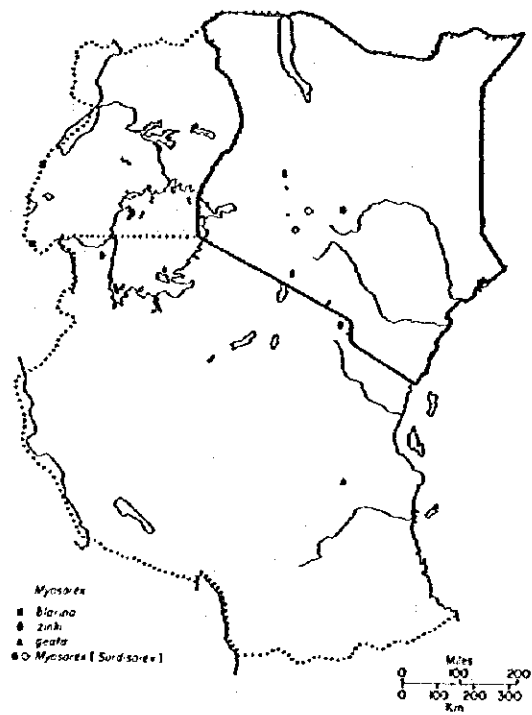
Golden-rumped Elephant-shrew *
Black & Rufous Elephant-shrew * (a)



Four-toed Elephant-shrew * (a)

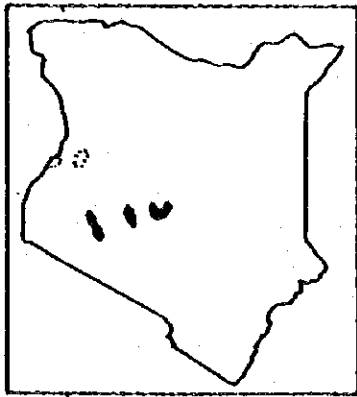


Golden Mole * (a)

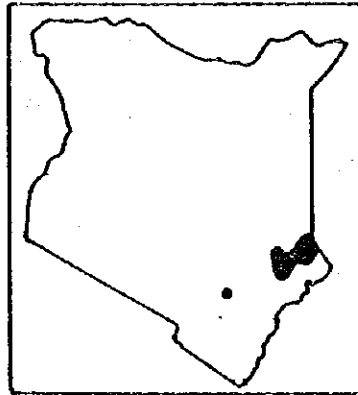


Kenya Mole-shrew * (a)

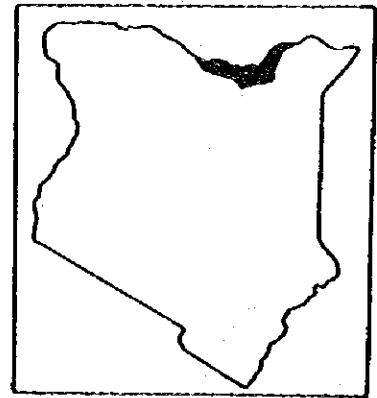
Appendix 1.21 (11) Distribution of Threatened and Other Large Mammal Species in Kenya



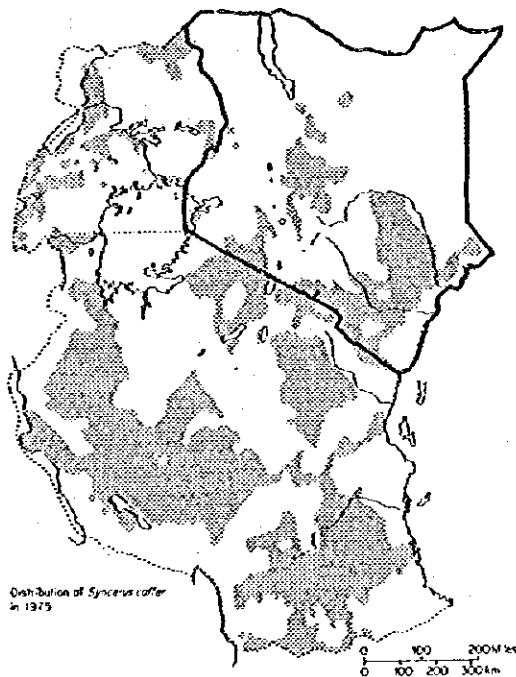
Eastern Bongo * (e)



Hirola * (e)



Soemmerring's Gazelle * (e)



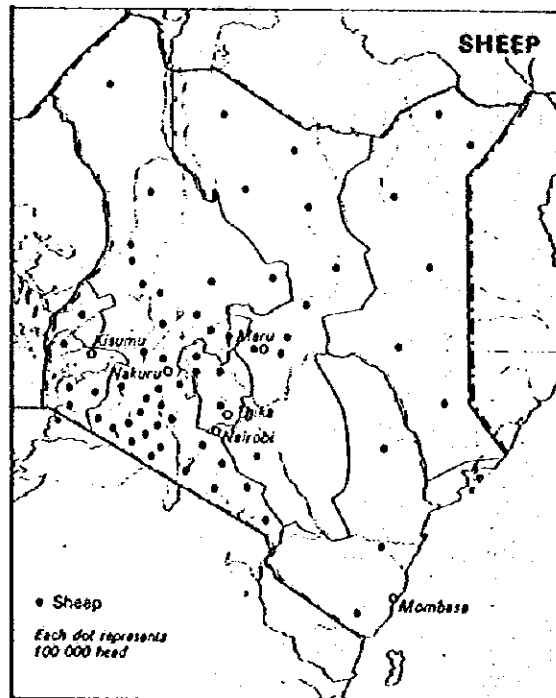
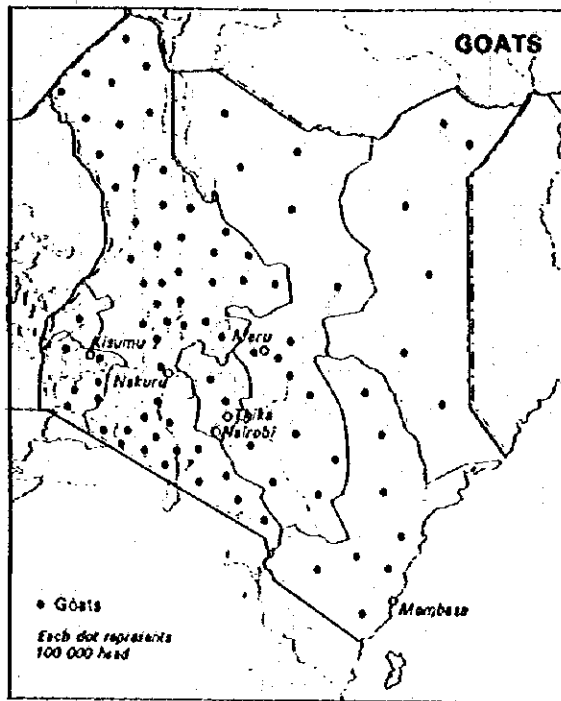
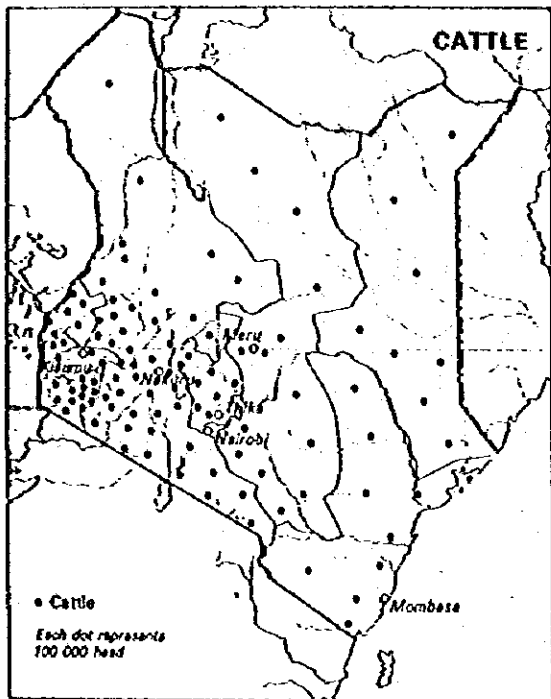
African Buffalo (a)



Lesser Hamster-rat * (a)

Note : * Threatened species
 Source : (a) J. Kingdon (1971, 1974, 1977, 1979, 1982)
 (b) D. M. Nyeki (1993)
 (c) P. Duncan, IUCN / SSC Equid Specialist Group (1992)
 (d) Rhino Specialist Group
 (e) R. East, IUCN / SSC Antelope Specialist Group (1988)

Appendix 1.22 Distribution of Livestock in Kenya



Source : E.A.E.P. Ltd. & George Philip Ltd. (1991)

Appendix 2.1 (1) Characteristics of Protected Areas (1): Geography, Topography, Soils and Vegetation

No.	Name of Park / Reserve / Sanctuary and Local Situation	Area (sq km)	Ecological Zones	Geography	Topography	Soils	Vegetation
1	Nairobi N.P.	117.2	I	Tertiary Volcanics	Eastern Highland	Shallow Cambrian, Luvua, Phaeozems	Grassland, Wooded grassland, Riverine forest
2	Hells Gate N.P.	68.0	A	Quaternary Volcanics	Rift Valley	Luvua, Regosols, Regosols	Bushland
3	Lake Naivasha N.P.	180.0	I	Quaternary Sediments	Rift Valley-Lake	Solonch, Solonchaks, Planosols	Wooded grassland
4	Largodip N.P.	52.00	II	Quaternary Volcanics	Rift Valley	Luvua, Regosols, Regosols	Bushland
5	Aberdare N.P.	284.19	I	Tertiary Volcanics	Eastern Highland/Mountain	Vertisol, Luvua, Regosols, Regosols	Montane forest, Grassland, Bushland, Riverine forest, Montane woodland
6	Lushoto N.P.	162.0	I	Tertiary Volcanics	Eastern Highland	Vertisol, Gleysols, Planosols	Grassland, Wooded grassland
7	Mamasa N.S.	5.0	II	Pre-cambrian Basement	Eastern Highland	Shallow Cambrian, Luvua, Phaeozems	Forest, Wooded grassland
8	Bulalo Spring N.S.	131.00	II	Pre-cambrian Basement	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems	Wooded grassland, Bushland, Riverine forest
9	Samburu N.S.	165.00	II	Pre-cambrian Basement	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems, Chernozems	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
10	Shaba N.S.	28.10	II	Pre-cambrian Basement	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
11	Mount Kenya N.P.	717.58	I	Tertiary Volcanics	Eastern Highland/Mountain	Nitrosols, Andisols, Luvua, Regosols, Regosols	Montane forest, Grassland, Riverine forest
12	O-Okinyi/Sabaki N.P.	16.42	II	Tertiary Sediments	Eastern Highland	Ferralsols, Andisols, Inceptisols, Regosols	Montane forest, Wooded grassland
13	Mwea N.P.	68.05	II	Pre-cambrian Basement	Eastern Highland	Solonch, Solonchaks, Planosols	Woodland, Thorn-bushland
14	Arabuko N.P.	362.08	II	Quaternary Sediments	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems, Vertisols, Gleysols, Planosols	Woodland, Wooded grassland, Bushland, Riverine forest
15	Mwai N.S.	1,510.00	II	Tertiary Volcanics, Pre-cambrian Basement	Western Highland	Shallow Cambrian, Luvua, Phaeozems	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
16	Ruin N.S.	15.00	II	Quaternary Sediments	Western Highland	Vertisols, Gleysols, Planosols	Woodland, Bushland, Wooded grassland
17	Nitobe Island N.P.	4.20	I	Granites	Lake Victoria Lowland & Pongasin/Lake Island	Vertisols, Gleysols, Planosols	Bushland
18	Karuri Injua L.S.	0.34	I	Tertiary Volcanics	Western Highland	Nitrosols, Andisols	Wooded grassland, Bushland, Riverine forest
19	Kalungu N.S.	44.85	I	Pre-cambrian Basement	Western Highland	Shallow Cambrian, Luvua, Phaeozems	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
20	Mount Elgon N.P.	182.20	II	Tertiary Volcanics	Western Highland/Mountain	Vertisols, Gleysols, Planosols	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
21	Salt Lake N.P.	5.50	II	Pre-cambrian Basement	Western Highland	Vertisols, Gleysols, Planosols	Woodland, Bushland, Wooded grassland
22	Hemba N.P.	92.00	II	Pre-cambrian Basement	Western Highland	Nitrosols, Andisols	Wooded grassland, Bushland, Riverine forest
23	Farmacia N.S.	87.74	II	Quaternary Sediments	Western Highland	Luvua, Phaeozems, Chernozems	Woodland
24	Rima N.S.	65.70	II	Quaternary Sediments	Western Highland	Luvua, Phaeozems, Chernozems	Woodland
25	Lake Bogoria N.S.	107.05	II	Tertiary Volcanics	Rift Valley-Lake	Shallow Cambrian, Luvua, Phaeozems	Thorn-bushland, Grassland, Bushland forest
26	South Lukenya N.S.	1,091.00	II	Pre-cambrian Basement	Northern Plateau, Western Highland	Utrichsols, Regosols, Vertisols, Solonch, Solonchaks, Planosols	Thorn-bushland, Bushland, Riverine forest
27	Shaba N.P.	1,570.05	II-2	Tertiary Volcanics, Quaternary Sediments	Northern Plateau	Solonch, Solonchaks, Planosols	Bushland, Wooded grassland, Bushland, Riverine forest
28	Central Injua N.P.	5.00	II-2	Quaternary Sediments	Northern Plateau/Lake Island	Luvua, Regosols, Regosols	Bushland
29	South Injua N.P.	36.80	II-2	Quaternary Volcanics	Northern Plateau/Lake Island	Luvua, Regosols, Regosols	Bushland
30	Mambili N.S.	2,068.00	II-2	Quaternary Volcanics	Northern Plateau	Shallow Cambrian, Luvua, Phaeozems, Solonch, Solonchaks, Planosols	Thorn-bushland, Wooded grassland, Bushland, Riverine forest
31	Olman N.S.	1,416.00	II	Quaternary Volcanics, Pre-cambrian Basement	Northern Plateau, Lowland Plateau	Solonch, Solonchaks, Planosols	Thorn-bushland, Wooded grassland, Bushland, Riverine forest
32	Olman Hill N.P.	678.00	III-1	Andisols	Lowland Plateau, Duane-High Low Belt	Luvua, Regosols, Regosols	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
33	Rona N.P.	1,787.80	II	Pre-cambrian Basement	Lowland Plateau	Luvua, Phaeozems, Chernozems, Luvua, Phaeozems, Chernozems	Woodland, Thorn-bushland, Wooded grassland
34	Ikona N.P.	671.44	II	Quaternary Volcanics, Pre-cambrian Basement	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems, Chernozems	Woodland, Thorn-bushland
35	Bushland N.S.	668.00	II	Pre-cambrian Basement	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems, Chernozems	Woodland, Thorn-bushland
36	Narai N.S.	742.00	II	Pre-cambrian Basement	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems, Chernozems, Solonch, Solonchaks, Planosols	Woodland, Bushland, Riverine forest
37	Parika N.S.	1,270.00	II-1	Quaternary Volcanics, Pre-cambrian Basement	Duane-High Low Belt	Solonch, Solonchaks, Planosols	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
38	Amala N.S.	523.24	II	Quaternary Sediments	Coastal Belt & Plain	Vertisols, Gleysols, Planosols	Woodland, Riverine forest
39	Tana Pong Pong N.S.	183.00	II	Quaternary Sediments	Duane-High Low Belt	Ferralsols, Andisols, Inceptisols, Vertisols	Woodland, Riverine forest
40	Shimba Hills N.S.	192.51	IV	Thames	Coastal Over/Marine Height	-	Coastal forest, Wooded grassland
41	Kariakoo N.P.	38.00	IV	-	Coastal Over/Marine Island	-	Marine forest community, Coastal forest
42	Mpungu Harro N.S.	11.00	IV	-	Coastal Ocean	-	Marine forest community, Coastal forest
43	Mombasa Marine N.P.	10.00	IV	-	Coastal Ocean	-	Marine forest community, Coastal forest
44	Mombasa Marine N.S.	200.00	IV	-	Coastal Ocean	-	Marine forest community, Coastal forest
45	Arabuko Shaba N.P.	8.00	IV	Quaternary Sediments	Coastal Belt & Plain	Solonch, Solonchaks, Planosols	Coastal forest
46	Mandimba N.P.	6.00	IV	-	Coastal Ocean	-	Marine forest community, Coastal forest
47	Nairobi Marine N.P.	32.00	IV	-	Coastal Ocean	-	Marine forest community, Coastal forest
48	Mandimba N.S.	21,308	IV	-	Coastal Ocean	-	Marine forest community, Coastal forest
49	Wangari Maathai N.S.	38.00	IV	-	Coastal Over/Marine Island	Luvua, Phaeozems, Chernozems	Coastal forest, Woodland, Bushland
50	Bora N.S.	1,326.00	II	Quaternary Sediments	Coastal Belt & Plain	Vertisols, Gleysols, Planosols	Coastal forest, Woodland, Bushland
51	Dagorroi N.S.	677.38	II	Quaternary Sediments	Coastal Belt & Plain	Vertisols, Gleysols, Planosols	Coastal forest, Woodland, Bushland
52	Rungu Marine N.S.	250.00	IV	-	Coastal Over/Marine Island	Shallow Cambrian, Luvua, Phaeozems, Nitrosols, Andisols	Marine forest community, Coastal forest
53	Chyulu N.P.	470.00	II	Quaternary Volcanics	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems, Vertisols, Andisols, Inceptisols, Vertisols	Forest, Woodland, Grassland
54	Tavo East N.P.	11,767.00	II, III-1	Pre-cambrian Basement	Lowland Plateau, Duane-High Low Belt	Shallow Cambrian, Luvua, Phaeozems, Vertisols, Andisols, Inceptisols, Vertisols	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
55	Tavo West N.P.	1,833.00	II	Quaternary Sediments, Pre-cambrian Basement	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems, Vertisols, Andisols, Inceptisols, Vertisols	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest
56	Tavo Hills N.P.	5,045.00	II	Quaternary Sediments, Pre-cambrian Basement	Lowland Plateau	Shallow Cambrian, Luvua, Phaeozems, Vertisols, Andisols, Inceptisols, Vertisols	Woodland, Bushland, Wooded grassland, Bushland, Riverine forest

Source: Survey of Kenya, Kenya (1970). Kenya Soil Survey, Min. of Agriculture (1982), Min. of Water Development & JICA, Japan (1992), The World Bank (1993)

Appendix 2.1 (2) Characteristics of Protected Areas (2): Wild Animals (a)

No.	National Park/Reserve/Sanctuary and Local	Black Rhino No. (density/ha) (1989)	Elephant No. (density/ha) (1989)	Antelope Biological Importance	Large Ungulates (1 sp) Density/ha (1987-89)	Sp. No.	Camivores (25-sp)	Herbivores (46-sp)	Primates (13 sp)	Total (83 sp)	Sp. No. of Birds Waterfowl	Terrestrial	Total
1	Nairobi N.P.	57 (0.48)		23		15	22	28	5	33	83	304	387
2	Hells Gate N.P.	(+)		12		10	6	19	2	27			
3	Lake Natron N.P.			18		12	19	23	5	47	103	236	369
4	Loprodor N.P.			26		10	14	20	5	39	28	172	200
5	Aberdare N.P.	2100 (2.74)		26									
6	Laikipia N.P.	(+)		25		9	14	23	4	41	11	120	131
7	Meru N.S.			36	2.09	13	25	27	5	56	43	322	305
8	Buffalo Springs N.R.	a 200 (0.37)		a		a	25	26	5	55	a	a	a
9	Samburu N.P.	a		a		a	25	24	4	43	a	a	a
10	Shaba N.R.			25		9	14	23	4	41	11	120	131
11	Mount Kenya N.P.	1000 (1.38)		25		9	14	23	4	41	11	120	131
12	Oldoinyo Sabuk N.P.			33 (0.48)		9	5	9	2	16			
13	Mesa N.R.			30		16	23	28	4	55	94	328	422
14	Amboseli N.P.	735 (1.87)		39	20.38	17	25	33	8	68	67	385	452
15	Masai Mara N.R.	1300 (0.98)		12	36.12	9	8	15	2	24	11	37	48
16	Ruma N.P.			10		8	16	18	3	38	38	99	135
17	Idiroo Island N.P.			10	0.30	4	3	10	4	17	0	60	60
18	Karuru Impati L.S.			17		7	8	18	4	28	6	173	179
19	Kasinaga N.R.			2		2	3	8	4	15	3	98	101
20	Mount Elgon N.P.	250 (1.48)		2		2	2	12	2	16			
21	Mount Kenya N.P.			17		7	11	15	2	28			
22	Naiboto N.R.	200 (2.17)		14	0.52	9	22	20	2	45	47	318	365
23	Karnarok N.R.	<50 (<0.37)		17	0.46	9	22	20	2	45	47	318	365
24	Pindi N.P.	<50 (<0.76)		2		2	2	10	2	15			
25	Lake Bogoria N.R.			10		8	16	18	3	38	38	99	135
26	South Tlaliara N.R.			23	3.49	7	11	15	2	28			
27	Shaba N.P.			14	0.52	9	22	20	2	45	47	318	365
28	Central Island N.P.			17		7	11	15	2	28			
29	South Island N.P.			2		2	2	10	2	15			
30	Meru N.P.	250 (0.12)		14	0.52	9	22	20	2	45	47	318	365
31	Loita N.P.	<50 (<0.50)		17	0.46	9	22	20	2	45	47	318	365
32	Makindu N.P.	<50 (<0.08)		14	0.00	9	22	20	2	45	47	318	365
33	Kora N.P.	<50 (<0.03)		c 45	0.10	c 14	6	18	2	26			
34	Meru N.P.	220 (0.23)		c	0.71	c	23	28	7	58	42	201	333
35	Blumental N.R.	<50 (<0.08)		c		c	6	14	2	22			
36	North Kenya N.P.	50 (0.07)		c		c	6	14	2	22			
37	Parole N.R.	<50 (<0.04)		c	0.35	c	4	13	2	19			
38	Arushe N.R.	<50 (<0.08)		c	1.90	c	9	17	6	33	8	143	151
39	Tana River Primate N.R.	<50 (<0.30)		b		b	8	14	6	28	0	103	93
40	Shimba Hills N.R.	400 (2.09)		b		b	8	14	6	28	0	103	93
41	Kala Nampe N.P.			19		3	3	6	6	21	0	21	21
42	Munguli Marine N.R.			19		3	3	6	6	21	0	21	21
43	Mombasa Marine N.P.			19		3	3	6	6	21	0	21	21
44	Mombasa Marine N.P.			19		3	3	6	6	21	0	21	21
45	Mombasa Marine N.P.			19		3	3	6	6	21	0	21	21
46	Mombasa Marine N.P.			19		3	3	6	6	21	0	21	21
47	Watership Marine N.R.			19		3	3	6	6	21	0	21	21
48	Muliyil Marine N.R.			19		3	3	6	6	21	0	21	21
49	Watership Marine N.R.			19		3	3	6	6	21	0	21	21
50	Boni N.R.	<50 (<0.04)		d 28	0.31	d 8	25	31	5	61	b 91	b 429	b 520
51	Dodori N.R.	<50 (<0.08)		d	4.46	d	25	31	5	61	b 91	b 429	b 520
52	Kangya Marine N.R.			b		b	25	31	5	61	b 91	b 429	b 520
53	Chyulu N.P.			b		b	25	31	5	61	b 91	b 429	b 520
54	Tana East N.P.			b 53	1.39	b 16	25	31	5	61	b 91	b 429	b 520
55	South-Kisumu N.R.	<50 (<0.03)		b		b	25	31	5	61	b 91	b 429	b 520
56	Tana West N.P.			b		b	25	31	5	61	b 91	b 429	b 520

Note: The alphabets, a to e, indicate each group of NPI/NR to be calculated altogether for the columns.

+ existing, (+) probably existing, * underestimated

Source: [Black Rhino/Elephant] KWS (1990), [Antelopes] R.East, IUCN/SSC Antelope Specialist Group (1988), [Large Ungulates] Dept. of Resource Surveys & Remote Sensing, Kenya (1989), [Sp.No. of Mammals/Birds] J.G. Williams (1981), The National Biodiversity Unit, Kenya & CDA, UK (1992), D.M. Nyeki (1993)

Appendix 2.1 (3) Characteristics of Protected Areas (3): Wild Animals (b)

No.	National Park / Reserve / Sanctuary and Local Sanctuary	Main Species / Threatened / Endemic Species
1	Naruto N.P.	Leopard, Cheviat, Burmese's zebra, Black minor, M.gaffin, Buffalo, Wildbeest, Kongoni, Mountain reedbuck
2	Hells Gate N.P.	Burchell's zebra, Buffalo, Eland, Kongoni, Grant's/Thomson's gazelle, Bles of grey/Lammerbeaver, Ruppel's vulture, Swift
3	Lake Nakuru N.P.	Rufous, Black/White rhinos, Buffalo, Waterbuck, Impala, Warthog, Greater/Lesser flamingo, White pelican
4	Lopponi N.P.	Burchell's zebra, Buffalo, Eland, Kongoni, Grant's/Thomson's gazelle
5	Aberdare N.P.	E. Black & white cobweb, Elephant, Black rhino, Giant forest hog, Buffalo, Bushbuck, Bongo, Harvey's red/Common duiker, Mountain reedbuck, Kippingsong, Suni, Kenya mole-shrew
6	Laisie N.P.	Elephant, Burchell's zebra, Buffalo, Eland, Waterbuck, Kongoni, Impala
7	Marild N.S.	Leopard
8	Buffalo Spring N.R.	Leopard, Elephant, Grey's zebra, B.Oryx, Guenther's/Kirk's dikdik, Impala, Genet, Grant's gazelle
9	Samburu N.P.	Leopard, Elephant, Grant's zebra, B.Oryx, Guenther's/Kirk's dikdik, Impala, Genet, Grant's gazelle, Nile crocodile
10	Shaba N.R.	Leopard, Cheviat, Grey's zebra, B.Oryx, Guenther's/Kirk's dikdik, Impala, Genet, Grant's gazelle
11	Mount Kenya N.P.	Rock hyrax, (Elephant, Giant forest hog, Bushbuck, Bongo, Harvey's red/black-horned/Common duiker, Kippingsong, Starbuck, Suni, Kenya mole-shrew), around N.P.
12	Ch-Donyo Sabuk N.P.	Leopard, Buffalo, Bushbuck, Bush pig, Buffalo
13	Mwea N.R.	Elephant, Hippopotamus, Buffalo, Waterbuck, Nile crocodile
14	Antares N.P.	Cheetah, Elephant, Black rhino, Wildbeest, Impala, Grant's gazelle
15	Masai Mara N.R.	Wild dog, Lion, Leopard, Cheetah, Elephant, Black/White rhino, Burchell's zebra, Eland, Wildbeest, Kongoni, Topi, Impala, Mountain reedbuck, Grant's/Thomson's gazelle
16	Ruma N.P.	Leopard, Rhino, Buffalo, Roan antelope, Jharabeest, Topi
17	Nairobi N.P.	Hippopotamus, Impala, Siatunga, Nile crocodile
18	Kauno Impati L.S.	Hippopotamus, Impala
19	Kalamaga N.R.	Primate (Red-tailed monkey, De Brazza's monkey, Poto), Bushbuck, Blue/Weyna/Yellow-backed duiker, Turner's armadillo, Chapin's shrew, Butterfly
20	Mount Elgon N.P.	Leopard, Golden cat, Elephant, Rock hyrax, Buffalo, Waterbuck, Bushbuck, Blue/Black-horned/Weyna/Common duiker, Bles, Golden mole
21	Savva Swamp N.P.	Siatunga, De Brazza's monkey
22	Nesole N.R.	Elephant, Rhino, Buffalo, B.Oryx, Lesser kudu
23	Kammanik N.R.	Elephant, Burchell's zebra, Buffalo, Waterbuck, Bushbuck, Greater kudu
24	Pemba N.R.	Elephant, Burchell's zebra, Buffalo, Waterbuck, Bushbuck, Greater kudu
25	Lake Bogoria N.R.	Greater kudu, Greater/lesser flamingo
26	South Turkana N.R.	Elephant, Rhino, Buffalo, B.Oryx, Greater kudu
27	Shab N.P.	Cheetah, Grey's zebra, Hippopotamus, B.Oryx, Topi, Guenther's dikdik, Grant's gazelle, Nile crocodile, African stammer, Migratory birds (Flamingo, Pelican), Fishes
28	Central Island N.P.	Hippopotamus, Nile crocodile
29	South Island N.P.	Hippopotamus, Nile crocodile, Venomous snakes
30	Marsabit N.R.	Elephant, Buffalo, Greater kudu
31	Loos N.R.	Guenther's dikdik
32	Makia Mar N.P.	Lesser kudu, B.Oryx, Waterbuck, Kongoni, Guenther's/Kirk's dikdik, Impala, Genet, Grant's gazelle
33	Kora N.P.	Lion, Leopard, Cheetah, Elephant, Grey's zebra, Lesser kudu, B.Oryx, Waterbuck, Kongoni, Guenther's/Kirk's dikdik, Impala, Genet, Grant's gazelle
34	Mau N.P.	Elephant, Buffalo
35	Barot N.R.	Hippopotamus, Nile crocodile
36	North Karu N.R.	Grey's zebra, Lesser kudu, B.Oryx, Waterbuck, Kongoni, Guenther's/Kirk's dikdik, Impala, Genet, Grant's gazelle
37	Raboh N.R.	Elephant, Hircel, Grey's zebra
38	Amwaa N.R.	Primate (Tana River mangabey, Tana River orobous, Zanibar gibbon), Tana River catfish
39	Tana River Primate N.R.	Elephant, Sable antelope
40	Shimba Hills N.R.	Pelagic birds (Roseate/Sooty terns), Green turtle, Marine aquatics
41	Karu Marine N.P.	Marine aquatics (Corals, Fishes)
42	Mungat Marine N.P.	Marine aquatics (Corals, Fishes)
43	Mombasa Marine N.P.	Marine aquatics (Corals, Fishes)
44	Mombasa Marine N.P.	Socato burghashed monopost, Bushbuck, Ader's duiker, Golden-rumped elephant-shrew, Socato scops-owl, Socato pipit, Carle's weaver, Butterflies
45	Atukio-Soko N.P.	Marine aquatics
46	Mauca Marine N.P.	Marine aquatics (Corals, Fishes)
47	Wazara Marine N.P.	Green turtle, Marine aquatics (Corals, Fishes)
48	Makidi Marine N.R.	Marine aquatics (Corals, Fishes)
49	Wazara Marine N.R.	Sika's monkey, Elephant, Harvey's red duiker, Guenther's/Kirk's dikdik, Haggard's orob, Topi
50	Boni N.R.	Sika's monkey, Elephant, Harvey's red duiker, Guenther's/Kirk's dikdik, Haggard's orob, Topi, Lesser kudu, Dugong, Pelican, Green turtle
51	Dodon N.R.	Dugong, Sea birds (Gulls, Terns), Green turtle, Marine aquatics (Corals, Fishes)
52	Kungu Marine N.R.	Elephant, Black rhino, Buffalo, Eland, Greater kudu, Bles
53	Chyulu N.P.	Wild dog, Cheetah, Elephant, Burchell's zebra, Buffalo, Eland, Lesser kudu, F.Oryx, Waterbuck, Kongoni, Hircel, Kippingsong, Kirk's dikdik, Starbuck, Impala, crocodile
54	Tavo East N.P.	Wild dog, Cheetah, Elephant, Burchell's zebra, Buffalo, Eland, Lesser kudu, F.Oryx, Waterbuck, Buffalo, Grant's gazelle, Nile crocodile
55	South Kivu N.R.	Wild dog, Cheetah, Elephant, Burchell's zebra, Buffalo, Eland, Lesser kudu, F.Oryx, Waterbuck, Buffalo, Grant's gazelle, Nile crocodile
56	Tavo West N.P.	Wild dog, Cheetah, Elephant, Burchell's zebra, Buffalo, Eland, Lesser kudu, F.Oryx, Waterbuck, Buffalo, Grant's gazelle, Nile crocodile

Source: R. East, IUCN/SSC Antelope Specialist Group (1988), The National Biodiversity Unit, Kenya & ODA, UK (1992), D.M. Nyek (1993), The World Bank (1993), KWS (1994 information)

Appendix A. Interview Survey to KWS and County Council Offices

For each Tourism Region, interview surveys with KWS and County Council offices have been carried out between 21 November and 17 December, 1994 in order to determine present environmental problems, wildlife management/conservation measures, obstacles for their implementation and tourism development in NP/NR and its surrounding areas. A total of 21 offices were interviewed that is as for KWS, nine in the Central, five in the Western and five in the Coastal Tourism Region. As for County Councils, one in the Central and one in the Western Tourism Region were interviewed. In addition, field visits to a total of 21 NP/NRs and three other important areas were made, mostly with escort by KWS staff after the interviews.

In the case of Mombasa office of KWS, a questionnaire survey of the same contents was sent on behalf of the interview survey. Although the same questionnaires were sent to other three KWS offices located in these Tourism Regions, no replies were received.

Interviewees were senior officers like wardens and assistant wardens. The interviews took about one to two hours for completion. Mainly the following questions were asked.

1. Administration

- a) Number of outposts,
- b) Number of staff: senior warden, warden, assistant warden, ranger, and others.

2. Characteristics of Natural Environment/Ecosystem

- a) Climate, topography and so on,
- b) Vegetation types with dominant plant species,
- c) Dominant animal species with the population trend and the distribution,
- d) Special ecologically important or sensitive areas other than NP/NR; which could be proposed as protected or conservation areas.

3. Problems in the Natural Environment

- a) Nature caused problems, for example flood, drought,
- b) Human caused problems, for example illegal grazing, illegal tree felling, illegal hunting/fishing, soil erosion, siltation, pollution, wildlife conflict,
- c) Tourism caused problems, for example off-road driving, litter/sewage, wild animal harassment/feeding, over-use by visitors.

4. Problems in Administration for Implementation of Management/Conservation

- a) Administration, management policy, land use and so on,
- b) Shortage or bad conditions of infrastructure, facilities, equipment, transport and so on.

5. Conservation/Management Measures

- a) Planning or progress of the Five Year Management Plan for protected areas, Agreement for NR management between KWS and County Councils, Memorandum of Understanding for forest conservation between KWS and Forest Department and so on,
- b) NP/NR management/wildlife conservation programmes, for example anti-poaching, fire control, animal translocation/culling, fencing, specific species conservation,
- c) Community wildlife programmes, for example number/names of local communities involved, wildlife-based development (extension), environmental education, problem animal control, revenue sharing.

6. Tourism Development

- a) Present visitor condition: number/year,
- b) Expected visitor carrying capacity: number/year,
- c) Tourism potential/development direction, that is tourism resource, mass tourism or up-market (or eco-) tourism,
- d) Needs for tourism development, that is infrastructure development, visitor service/education, promotion/advertisement.

7. Other Information

- a) Land use and development activities in the surrounding areas of NP/NR,
- b) Foreign aid projects for NP/NR management/wildlife conservation,
- c) Security and so on.

The results of this survey are compiled in Appendix A(1)-A(13).

Appendix A (1) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Date	Corresponding Districts	NP/NR/Others (sq.km) (* field visit)	Administration Outpost (No.)	Staff (No.)	Natural Environment Climate/Topography	Vegetation
[Coastal Tourism Region]							
1 KWS: Lamu HQ	94.11.21-22	Lamu	Kiunga MNR (250.0) Doodoi NR (877.4) Lamu/Manda Islands*	(7) Kiunga Mojoke Npiketoni Mkokoni Hindi Baamo Witu	(66) 2 Wardens 4 Assistant Wardens 60 ca. Rangers	Coastal ocean with coral islands. Wet and high temperature. Dry season: January-March, Rainy season: April-June	Mangrove forest (Rhizophora, Sonneratia, Ceriops, etc.) the best preserved (total 46 sq.km). Coral reefs. Coastal lowland forest
[Central Tourism Region]							
2 KWS: Malindi/Watamu HQ	94.11.24	Kaji	Malindi MNP/MNR* (219.1) Watamu MNP/MNR* (64.0) Arabuko Sokoke NP* (6.0) Kisite MNP*	(4) Watamu Arabuko Sokoke Bamba Btengo (None)	(47) 3 Wardens 1 Assistant Warden 43 Rangers	Coastal ocean with creek	Mangrove forest (Rhizophora, etc.), Coral reefs. Coastal lowland forest with 6 distinct types (Azelia, Brachystegia, etc.)
3 KWS: Shimoni Station	94.11.25	Kwale	Mpungub MNR* (11.0) Wasini Island* Shimba Hills NR* (192.5)	(3) Lunga Lunga Kenango Makunon	(38) 2 Wardens 1 Assistant Warden 23 Rangers 12 Others	Coastal ocean with coral islands. Important water catchment for Mombasa/Diani	Coral reefs: the best preserved. Mangrove forest. (Rhizophora, Ceriops, etc.). Seagrass beds
4 KWS: Shimba Hills HQ	94.11.26	Kwale	Mombasa MNP/MNR* (210.0)	(56) 1 Senior Warden	(45) 1 Warden 2 Assistant Wardens 42 Rangers	Coastal ocean	Coastal lowland (tropical rain) forest. Cariba pine forest (plantation). Fire-induced grassland
5 KWS: Mombasa HQ	95.1.4 (questionnaire)	Mombasa					
6 KWS: Nanyuki HQ	94.11.29	Laitipia	Laitipia NR (165.0)	(5) Lonyek Rumunul Ngorbit Doidoi Sipili	(37) 1 Warden 3 Assistant Wardens 28 Rangers 8 Others	Eastern highland with plateau/hills	Grassland. Wooded grassland
7 KWS/Isiolo C.C. Isiolo/Samburu Complex HQ	94.11.30	Isiolo Samburu	Shaba NR* (239.1) Bulale Springs NR* (131.0) Samburu NR* (165.0)	(39) 1 Senior Warden (Isiolo C.C.) 1 Assistant Warden (Samburu C.C.) 2 Assistant Wardens (KWS) 22 Rangers 13 Others	(39) 1 Senior Warden 3 Assistant Wardens 28 Rangers 8 Others	Low plateau	Semi-arid bushed grassland (Acacia, Commiphora, Chloris, etc.)
8 KWS: Mt. Kenya NP HQ	94.12.1	Nyeri Meru Embu Kirinyaga Tharaka Nithi	Mt. Kenya NP (717.6)	(2) Simon Chongota	(43) 1 Warden 3 Assistant Wardens 20 Rangers 19 Others	Volcanic mountain with high altitude (3,200-5,200 m). High rainfall (> 2,000 mm/year). Important water catchment with many rivers	Alto-alpine glacier/moerland. Highland forest (Cedar, Camphor, Podocarpus, Meru oak, etc.)

Appendix A (2) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Date	Corresponding Districts	NP/NP/Other (sq.km) (Field visit)	Administration Outpost (No.)	Staff (No.)	Natural Environment Climate/Topography	Vegetation
9 KWS: Aberdare NP HQ	94.12.1	Nyeri Murang'a	Aberdare NP* (766.2)		(146) 1 Senior Warden 2 Wardens 3 Assistant Wardens 48 Rangers 50 Others	Volcanic mountain with high altitude (3,000-4,000 m)	Montane woodland, Bamboo forest, Highland forest
10 KWS: Lake Nakuru NP HQ	94.12.1	Nakuru	Lake Nakuru NP* (188.0)		(100) 1 Senior Warden 9 Wardens/Assistant Wardens 90 Rangers/Others	Rift Valley, Alkaline soda lake (pH: 10.2-10.5)	Woodland (Acacia, Euphorbia, etc.), Wooded grassland
11 KWS: Hell's Gate NP HQ	94.12.2	Nakuru	Hell's Gate NP (68.0) Longford NP (52.0)		(54) 1 Warden 2 Assistant Wardens 14 Rangers 37 Others	Rift Valley volcanic mountain with crater/corrie	Bushland
12 KWS: Embu HQ	94.12.2	Embu	Imwea NP* (48.0)	Imwea Kerinyaga (2)	(53) 1 Warden 2 Assistant Wardens 30 Rangers 11 Others	Eastern highland, Kamburu Reservoirs	Androm bushland (Acacia, Grews, Terminalia, Commiphora, etc.), Bushed grassland (Themeda, Chloris, Cymbodon, etc.) Highland forest (Tabernaemontana, Croton, etc.)
13 KWS: Oduyo NP HQ	94.12.2	Machakos	Oduyo Sabuk NP (18.4)	(1) Kihamba	(20) 1 Warden 1 Assistant Warden 13 Rangers	Eastern highland	Highland forest (8% of NP), Croton, Olea, Acacia, etc.
14 KWS: Naaroh NP HQ	94.12.3	Nairobi	Naaroh NP* (117.2)		(82) 1 Senior Warden 4 Assistant Wardens 40 Rangers 37 Others	Eastern highland	Grassland (8% of NP), Highland forest (6% of NP), Croton, Olea, Acacia, etc.
[Western Tourism Region]							
15 KWS: Kiambu HQ	94.12.13	Kiambu Salya	Ndole Island NP (6.2) Kiambu Impala LST* (0.3)	(3) Siyaya Ndole Island Kiambu Impala	(44) 1 Warden 2 Assistant Wardens 24 Rangers 77 Others	Lake Victoria with island	Woodland, Bushed grassland, Swamps
16 KWS: Kakamega HQ	94.12.14	Kakamega Busia Vihiga	Kakamega NP* (44.7)	(2) Port Victoria Soy	(53) 1 Warden 2 Assistant Wardens 19 Rangers 11 Others	Western highland, High rainfall (2,000 mm/year); rainy season in 3/4 of a year, important water catchment,	West African tropical rain forest (emmer) with endemic flora (Abies, Antiaris, Croton, Prunus, Ficus, Olea, etc.)
17 KWS: Nairobi NP HQ	94.12.15	West Pokot Turkana	Nairobi NP* (192.0) South Turkana NP (1091.4)	(1) Labbet (S. Turkana NP)	(51) 1 Warden 2 Assistant Wardens 39 Rangers 9 Others	Western highland/ Northern plainland, Short rainy season: October-December, Turkwell Gorge Arch Dam	Androm bushland (Acacia, Commiphora, etc.)

Appendix A (3) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Date	Corresponding Districts	NP/NP/Others (e/L/m) (* field visit)	Administration Outpost (No.)	Staff (No.)	Natural Environment Climate/Topography	Vegetation
18 KWS: Mt. Elgon NP HQ	94.12.15	Trans Nziha	Mt. Elgon NP* (169.2) Sawa Swamp NP* (5.5)	(5)	(109) 1 Warden 4 Assistant Wardens 70 Rangers 34 Others	Volcanic mountain with high altitude (2,100-4,200 m) and caldera/cave/hot springs	Montane moorland, Barbaco forests, Highland forest (Podocarpus, Cedar, Croton, Ficus, etc.), Swamps
19 KWS: Kabarnet Station	94.12.16	Baringo (Ekyo Marakwet)	Karnarok NR (87.7) (Rural NR: 65.7)	(4) Elmina Ravine Barnessa Mochongi Lake Baringo	(33) 1 Warden 2 Assistant Wardens 24 Rangers 6 Others	Koro Valley, Lake Karnarok	Arboreal bushland (Acacia, Balanites, Combretum, Cynodon, etc.)
20 Baringo C.C.: Lake Bogoria Station	94.12.17	Baringo	Lake Bogoria NP* (107.1) Lake Baringo*	(1) Lake Baringo	(38) 1 Warden 1 Assistant Warden 10 Rangers 24 Others	Rift Valley, Fresh-water lake, Alkaline soda lake with hot springs/geysers Rainy season: April-July (500-1,000 mm/year)	Arboreal bushland (Acacia, Salvadora, Terminalia, etc.), Swamps, Alkaline short grassland

Appendix A (4) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Natural Environment Animals	Ecologically Important Areas	Environmental Problems Nature Caused	Human Caused	Tourism Caused
(Coastal Tourism Region)					
1 KWS: Lamu HQ	Elephant (crossing to Manda Island), Hippopotamus, Topi, Dugong, Crocodile, Sea turtles, Sea birds, Coral fishes	Ras Tereni, Tana Delta (proposed to protected areas), Manda Island, Witu Forest,		Illegal/over-fishing by trawling, Water pollution by domestic sewage, Deterioration of coral reefs by siltation through Tana River and dredging works, Water decreases/soil deterioration/flood at Tana Delta by dam construction on the river, Illegal tree felling (mangroves), Wildlife conflict (crop damage by elephant, hippo)	None, because of little tourism development
2 KWS: Malindi/Watamu HQ	Elephant, Buffalo, Ader's duckler, Forest birds, Sea turtles, Coral fishes	Sabaki River basin, Vuma/Muarani		Illegal/armed/over-fishing by trawling, Situation through Sabaki River in Malindi, Beach erosion in Malindi, Illegal tree felling (mangroves), Subsistence poaching, Wildlife conflict (crop/human damage by elephant, buffalo, hippo, crocodile) Destruction of coral reefs by illegal dynamite fishing (1970s-80s)	
3 KWS: Shimoni Station	Sable antelope, Roan antelope (?), Sea turtles, Sea birds, Coral fishes	Diani (proposed to protected area), Twi, Wasini Island, Majoreni (proposed to conservation areas)	Beach erosion on coral islands		
4 KWS: Shimba Hills HQ	Elephant (600 ca.), Buffalo, Sable antelope (250 ca.?), Waterbuck, Bushbuck, Giraffe (introduced)	Ramsai River basin, Kaya Forests (Shimba, Lunguma, Longo-Mogandi, etc.), Majimoto Spring	Pest insects (weave fly, tick), Invasion of exotic plants (Lantana) to NR, Tree felling by increasing elephant	Illegal tree felling for timber/fire-wood housing material, Subsistence poaching, Fire into NR, Wildlife conflict (crop/human damage by elephant)	Off-road/over-speed driving, Litters in high season by domestic visitors
5 KWS: Mombasa HQ	Coral fishes (Parrot fishes, Puffers, Snappers, Surgefishes, Butterfly fishes, Groupers, etc.), Marine invertebrates (Beche-de-mer, Sea urchins, Shells, etc.)	All unprotected reef ecosystem	Flood by very heavy rains at a seasonal river, poor visibility at the entry point, lowering salinity, siltation, destruction of seagrass beds	Decrease of sea turtles by deterioration of nesting sites and mixed fishing by trawling	Destruction of corals by stepping on by swimmers, Water pollution by sewage from hotels, Litters
(Central Tourism Region)					
6 KWS: Nanyuki District	Elephant (2,500 ca., increasing), B. rhinoceros (in private ranches), Buffalo, Eland, Impala, Kudu, Waterbuck, Giraffe, B. zebra, Lion, Leopard, Cheetah	Mukogodo area	Drought	Disruption of wildlife dispersal areas by fencing, Soil erosion in the south, Subsistence poaching, Increase of wildlife conflict (crop/human damage by elephant) by expansion of settlements	None, because of no tourism development
7 KWS/Isoko C.C.: Isoko/Samburu Complex HQ	G. zebra (>1,000 increasing), Eland, Oryx, Genetuk, Impala, G. gazelle, Giraffe, Elephant, Lion, Leopard, Cheetah	Kuchichi area, Chandler Falls	Drought, Flood by heavy rains	Over-grazing by livestock around NRs, Grazing competition between livestock/wildlife, Disease infection from livestock to wildlife, Subsistence poaching	Off-road driving, Animal harassment (lion, cheetah), Animal feeding (baboon), Litters

Appendix A (5) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Natural Environment Animals	Ecologically Important Areas	Environmental Problems	
			Human Caused	Tourism Caused
8 KWS: Mt. Kenya NP HQ	Rodents, Rock hyrax in NP, 98% of animals inhabiting in the surrounding FR; Elephant, B. rhinoceros, Buffalo, Eland, Waterbuck, Bushbuck, Blue duiker, B. zebra, Giant forest hog, Bush pig, Baboon, B. & w. colobus Trout (introduced) B. rhinoceros (50 ca.), Elephant, Bongo Giant forest hog, B. & w. colobus	Mt. Kenya FR (indigenous forest zone)	Water decrease probably by deforestation, Fire into montane woodland, illegal tree felling for fire-wood/housing material in FR, Subsistence poaching/honey collecting, Wildlife conflict (crop damage by elephant, buffalo, bush pig, baboon) illegal tree-felling around the NP fences,	Soil erosion along nature trails, Animal feeding with garbage, change of feeding behavior (hyrax)
9 KWS: Aberdare NP HQ	B. rhinoceros (50 ca.), Elephant, Bongo Giant forest hog, B. & w. colobus			
10 KWS: Lake Nakuru NP HQ	Trout (introduced) Buffalo (500 ca.), Impala, Waterbuck, Warthog, B. rhinoceros, W. rhinoceros (introduced), G./L. flamingos (1.5 million: the largest population), Pelicans (2,000 ca.), Thiapia (introduced) Eland, Kungoni, G. gazelle, T. gazelle, Buffalo, Giraffe, B. zebra (migration between NPs)	Decrease of water level; decrease of fishes/pelicans and increase of flamingos	Water pollution by domestic sewage; Over-grazing by wildlife by fencing around NP, Clearing of vegetation for the pipeline project by National Grid, Wildlife conflict (crop damage by baboon, monkeys) Grazing competition between increasing livestock/wildlife,	Off-road driving, Litters/garbage, Animal harassment to breeding activities (flamingos)
11 KWS: Hell's Gate NP HQ	Buffalo, Giraffe, B. zebra	Hell's Kitchen, Hot springs		
12 KWS: Embou HQ	Elephant (50 ca.), Buffalo, Waterbuck, Hippopotamus, Leopard, Crocodile	West of Kambaru Reserve, North of Kambaru Reserve	Fire into NP, Soil erosion by agriculture around NP, Substance poaching, illegal fishing, illegal grazing by livestock, illegal tree felling for fire-wood, Wildlife conflict (crop damage by elephant)	None, because of no tourism development
13 KWS: Ol-Doinyo NP HQ	Buffalo, Bushbuck, Bush pig, Baboon, B. & w. colobus, Leopard	Fourteen Falls	Wildlife conflict (crop damage by hippo, baboon) Illegal tree felling/charcoal burning, Water pollution at Fourteen Falls through Athi/Nairobi Rivers, Wildlife conflict (crop damage by hippo, baboon) Disruption of wildlife dispersal areas by fencing, Litters by adjoining industries/towns, illegal grazing by livestock in the south of NP, Water pollution by industrial sewage through Athi River, Air pollution/offensive odor by industrial exhaust	None, because of little tourism development
14 KWS: Nairobi NP HQ	B. rhinoceros (50 ca.), Buffalo, Giraffe, B. zebra, Wildebeest (migration from the south of NP in dry season), Lion, Leopard, Cheetah	South of Nairobi NP (migration route)		Off-road/over-speed driving, Litters, Water pollution by sewage from hotels/restaurants through Athi River

Appendix A (6) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Natural Environment Animals	Ecologically Important Areas	Environmental Problems Nature Caused	Human Caused	Tourism Caused
15 KWS: Kisumu HQ [Western Tourism Region]	Impala (introduced), Sitatunga, Hippopotamus, Leopard, Crocodile, Fishes (Nile perch (introduced), Cichlid fishes, Lung fishes, etc.)	Lake Kanyaboli, Yala Swamp		Decrease of water level and salinization at Yala Swamp by agriculture/irrigation works, illegal tree felling/grass harvesting for fire-wood/housing material, Water pollution in the lake by industrial/agricultural sewage, eutrophication, following increase of water hyacinth, introduction of Nile perch and decrease of indigenous cichlid fishes, Disease infection from livestock to impala, Wildlife conflict (crop/human damage by hippo, baboon, monkeys, leopard, hyena, crocodile)	Animal feeding (impala)
16 KWS: Kakamega HQ	Monkeys (red-tailed monkey, B. & W. colobus, De-Brazza's monkey), Birds, Butterflies (endemic fauna with threatened species)	Kakamega Forest, Yala Nature Reserve, Isecheno Nature Reserve		illegal tree felling/grass harvesting for timber/fire-wood/housing material, Fire/casual burning in FR, Soil erosion by gold mining along rivers, Substance poaching/honey collecting, Increase of livestock	None, because of little tourism development
17 KWS: Nasolot NR HQ	Elephant (300-500), Buffalo, G./L. Iudus, Oryx, G. zebra, R. graffe (introduced), Lion, Leopard	Wei wei River, Orea Swamp, Kongozi Plain	Water decrease by drought	Soil erosion by gold mining along rivers, Substance poaching, illegal grazing by livestock, Wildlife conflict (crop/human damage by elephant)	None, because of little tourism development
18 KWS: Mt. Elgon NP HQ	Elephant (increasing), Waterbuck, Bushbuck, Sitatunga, Bush pig, De-Brazza's monkey, Bats		Invasion of exotic plants to Salwa Swamp NP	Fire into NFRs by poachers/honey collectors, Soil erosion by over-grazing by livestock, illegal tree felling for fire-wood	None, because of little tourism development
19 KWS: Kabarnet Station	Elephant, Buffalo, Waterbuck, Bushbuck, G. Iudu, G. zebra, Leopard, Cheetaah	Keno Valley, Tugen Hills: Kabartonjo, Kipsaran	Water decrease by drought, volcanic soils	Soil erosion on mountain slopes by over-grazing by livestock (goats/cattle) and no information to local people, Situation in Lake Khamarok	None, because of no tourism development
20 Baringo C.C.: Lake Bogoria Station	Hippopotamus, Crocodile, Birds (> 500 spp.), Fishes (Lake Baringo), G. Iudu, G./L. flamingos (0.7 million: increasing) (Lake Bogoria)	District FRs (28) around Tugen Hills, Lake Baringo (proposed to conservation area), Swamp in mouth of Mico River	Drought, Disease of flamingos (by population increase?)	Poaching to protest living right of local people in NFRs, Grazing competition between livestock/wildlife, illegal grazing by livestock, Situation in Lake Baringo by over-grazing by livestock, Wildlife conflict (crop/human damage by hippo, crocodile)	

Appendix A (7) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Administration Problems	Conservation/Management Measures Plan/Agreement/Memorandum	NP/NR Management/Wildlife Conservation Programmes (# planning)	Community Wildlife Programmes (# planning)
[Coastal Tourism Region]				
1 KWS: Lamu HQ	<p>Illegal settlement in Manda Island, Location near the border to Somalia, Water shortage by high consumption, Difficulty in boat operation by tidal difference, Bad road condition (rainy season in the north of Malindi), Shortage of transport (2 vehicles, 3 boats, 1 aircraft), Tourist harassment by hawkers at beach, Deficiency of water supply, Shortage of transport (1 vehicle, 2 boats/ equipment (buoys, life-saving jackets), Lack of scientific research/staff training, Communication problems with foreign visitors (Italian, German, French).</p>	<p>Memorandum of Understanding for forest conservation with Forest Department (Witu FR, etc.)</p>	<p>Conservation of breeding/feeding sites of dugong/sea turtles/sea birds#, Elephant programme for Manda Island's population#, Fencing around Lake Konyatta#</p>	<p>Wildlife extension to private ranches, Problem animal control by driving/stocking, Use of Wildlife Fund for Development</p>
2 KWS: Malindi/Watamu HQ	<p>Tourist harassment by hawkers at beach, Deficiency of water supply, Shortage of transport (1 vehicle, 2 boats/ equipment (buoys, life-saving jackets), Lack of scientific research/staff training, Communication problems with foreign visitors (Italian, German, French).</p>	<p>Memorandum of Understanding for forest conservation with Forest Department (Arabuko Sokoke FR, etc.), Arabuko Sokoke Forest Conservation Plan by KIFCOON; no implementation because of withdrawn by KIFCOON,</p>	<p>Patrol for illegal fishing, Investigation of illegal trade in marine products, Environmental fencing by thorn trees around NP#, Water monitoring in MNP/NR, Instruction on guideline for sewage discharge to hotels</p>	<p>Donation/loan of fishing gear/boats to fishermen's groups, Replantation of mangrove trees by local communities, Use of Wildlife Fund for Development</p>
3 KWS: Shimoni Station	<p>Land privatization, Location near the border to Tanzania, Shortage of transport (1 vehicle, 1 boat), Deficiency of water supply/clinics, Lack of staff training</p>	<p>None</p>	<p>Integrated conservation of marine ecosystem; establishment of Community Conservation Areas in Twi/Shimoni/ Wasini Island#</p>	<p>Enhancement of eco-tourism by construction of a lodge at Wasini Island, Support for school improvement at Shimoni/Wasini Island</p>
4 KWS: Shimba Hills HQ	<p>Difference of policy between KWS/Forest Department for implementation of the MOU, Occupation by private land in a part of NR, NR status; should be NP, Shortage of transport (4 vehicles)/plant (graders), Deficiency of offices/accommodation/ water supply, Lack of staff</p>	<p>5 Year Management Plan for NR (1993-97); draft and no implementation, Memorandum of Understanding for forest conservation with Forest Department (Shimba Hills FR, etc.); issues remained are fencing location and tree species for replantation</p>	<p>Fire management for sable antelope conservation and twelfthly control, Vegetation survey, Elephant programme: fencing (40 km) along the north of NR and a corridor between NP/FR, transportation, culling#, family planning#, Environmental fencing by thorn trees (Cesalpinie) along the south of NP#, Control on tourist activities by spot check/ warning signs/ditches</p>	<p>Establishment of Gohi-Mwaliganza Community Wildlife Conservation Ltd. and a private park around Maliganzani FR with re-introduction of rhino/hippot, Support for water supply to schools</p>
5 KWS: Mombasa HQ	<p>Shortage of transport (boats)/equipment (radios), No single entrance gate to MNP, imperfect entrance fee collection, Location of the HQ in the town far from MNP, Tourist harassment by hawkers at beach</p>	<p>None</p>	<p>Water monitoring in MNP/NR</p>	<p>Establishment of 2 community groups: Mombasa Boat Owners Association, Wyalu Bamburi Ulangu Fishermen Group, Wildlife extension: ostrich farms, Environmental education for school children through Wildlife Clubs, Information ponds for tourists/ local communities, Assistance/donation/loan for boat repairing to boat operators and fishing gear to fishermen, Problem animal control by trapping (baboon, monkeys)</p>

Appendix A (8) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Administration Problems	Conservation/Management Measures Plan/Agreement/Memorandum	NP/NR Management/Wildlife Conservation Programmes (# planning)	Community Wildlife Programmes (# planning)
(Central Tourism Region) 6 KWS: Nanyuki HQ	Human settlement in NR. Land sub-division for private ranches. Little information on tourism activities by private ranches. Storage of transport (2 vehicles, 1 lorry) equipment (radios)	5 Year Management Plan for NR (1991-96); no implementation. Agreement for NR management with C.C. Memorandum of Understanding for forest conservation with Forest Department (Mukogodo FR, etc.)	Elephant programme: family planning, denuding, fencing. Rhino programme: with establishment of Association of Private Rhino Sanctuary by KWS/S ranches. Establishment of Community Conservation Area in Mukogodo area# None, because of lack of fund	Establishment of 5 community groups. Holding of Laikipia Wildlife Forum. Culling of zebra in private ranches. Enhancement of eco-tourism for traditional nomadic pastoralists in Mukogodo area#
7 KWS/Isiolo C.C. Isiolo/Samburu Complex HQ	Military training in the north of Shaba NR. Bad road condition. Shortage of transport (2 vehicles, 1 lorry) plant (1 grader, 1 tractor)/equipment (radios, camping gear). Deficiency of offices/accommodation/ garage/water supply. Lack of research staff Control on tourist activities and rescue of sick/suffering tourists. Control on porter/guide activities. Dissatisfactions with no direct compensation for crop/livestock damage by wildlife. Bad road condition. Lack of trained staff	A fund of NR management agreement with C.C.s; KWS: wildlife/visitor security and advice on wildlife management to C.C.s. C.C.s: NR management/development	Use of 10% of NR revenue for development of public facilities as Isiolo District Wildlife Bursary Fund. Grants for school children by C.C.	
8 KWS: Mt. Kenya NP HQ	Control on tourist activities and rescue of sick/suffering tourists. Control on porter/guide activities. Dissatisfactions with no direct compensation for crop/livestock damage by wildlife. Bad road condition. Lack of trained staff	5 Year Management Plan for NP (1993-98); little implementation because of lack of fund. Memorandum of Understanding for forest conservation with Forest Department (Mt. Kenya FR); issues remained at location/fund for fencing	Establishment of rescue/forest patrol teams. Construction of a lodge in NP (Simion gate) with agreement between KWS and private developer. Fencing around NP/FR#	Community Afforestation Programme. Establishment of Association of Mt. Kenya Operators (by lodges, tourism agencies, porters, guides, KWS, MOTW, C.C.s, etc.) for tourism control/management. Support for school improvement/road grading. Problem animal control by shooting (Egypian geese)
9 KWS: Abernethy NP HQ	Deficiency of plant	5 Year Management Plan for NP (1991-96)	Rhino programme: ecological research, fencing (78 km) around NP including the most important salient. Restriction on visitor No.: capacity of camping sites (12 persons) /bandas (30 beds) and transport special buses to lodges and 4WD vehicles in NP with permission by the warden Fencing around NP. Monitoring of animal populations. Water monitoring at 3 effluent points in the lake	
10 KWS: Lake Nakuru NP HQ		5 Year Management Plan for NP; in progress		
11 KWS: Hell's Gate NP HQ	Encroachment to NPs by Masai people	5 Year Management Plan for NP (1992-97). Hell's Gate NP HQ: administration HQ for both Hell's Gate/Longonot NPs Agreement for NR management with C.C.; in progress. KWS: NR management/development on behalf of C.C.		
12 KWS: Embu HQ	Very bad road condition (rain season). Storage of transport (2 vehicles, 1 boat). Deficiency of offices/accommodation/ water supply. Lack of trained staff			Re-introduction of animals (rhinos, giraffe, eland, kongoni, zebra, etc.)#. Translocation of elephants. Fencing/ditching around NP#

Appendix A (9) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Administration Problems	Conservation/Management Measures Plan/Agreement/Memorandum	NP/NR Management/Wildlife Conservation Programmes (# planning)	Community Wildlife Programmes (# planning)
13 KWS: Odeoyo NP HQ	Bad road condition. Shortage of transport/plant/equipment (grass-cutting machine). Deficiency of offices/accommodation/ water supply. Little NP revenue by few visitors Land use control on the south of NP. expansion of agricultural land/settlements/ industries with land sub-division. Shortage of equipment (trucks)	None	Fencing around NP. Re-introduction of animals#	Environmental education#. Support for school construction. Problem animal control by culling/ driving/ditching
14 KWS: Nairobi NP HQ		5 Year Management Plan for NP. in progress	Fencing around NP except the south. Construction of water holes for animals. Rhino programme: 24 hr. observation by rangers and translocation. Monitoring of animal populations per 2 months. Clearing of exotic trees and plantation of indigenous trees. Clearing of litter in dry season	Cooperation with Embakasi Land Owner Associations, Kieni/Lele Land Owner Association. Support for school/accommodation/ water supply construction
[Western Tourism Region]				
15 KWS: Keuru HQ	Expansion of agricultural land/settlements with land privatization. Shortage of transport (1 vehicle, 1 boat). Lack of fund	5 Year Management Plan for Keuru Impata LS; in progress A kind of LS management agreement with C.C.; KWS: LS management/development in cooperation with C.C. Memorandum of Understanding for forest conservation with Forest Department (Kakamega FR, etc.). Kakamega Forest Conservation Plan by KIFCOON; no implementation because of withdrawn by KIFCOON. A kind of NR management agreement with C.C.; KWS: NR management/development (1991-98); no implementation because of lack of fund. Agreement for NR management with C.C.s (1993); KWS: NR management/development, Nasolet NR HQ; administration HQ for both Nasolet/South Turkana NRS Mt. Elgon NP HQ; administration HQ for both Mt. Elgon/Salwa Swamp NPS	Establishment of LS for sitatunga conservation with re-introduction#. Introduction of other animals#. Improvement of Animal Orphanage#.	Establishment of Nolele Island Community Group. Problem animal control by shooting/ trapping
16 KWS: Kakamega HQ	Human encroachment to FR. NR status; should be NP because of the state land. Difference of structure/policy between KWS/Forest Department for implementation of the MOU. Bad road/nature trail condition. Shortage of transport (1 vehicle). Lack of satisfactory scientific research Shortage of transport (2 vehicles, 1 lorry) plant/equipment (fire-arms). Very bad condition on game viewing road. Deficiency of water supply. Lack of staff (mechanics)		Establishment of nature trails camping sites	Integrated regional development for forest conservation with alteration of traditional life style#. agro-forestry, zero-grazing by livestock, fish farming, bee keeping, etc.. Support of school supplies#
17 KWS: Nasolet NR HQ			None; because of lack of fund	Construction of wells/water holes for local communities/livestock/wildlife
18 KWS: Mt. Elgon NP HQ	Human encroachment to NP, Location along the border to Uganda. Bad road condition (rainy season). Shortage of transport (2 vehicles, 2 lorries). Deficiency of offices/accommodation, Difficulty in access/material supply by location in the remote area		Anti-poaching by Wildlife Protection Unit	

Appendix A (10) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Administration Problems	Conservation/Management Measures Plan/Agreement/Memorandum	NP/NR Management/Wildlife Conservation Programmes (# planning)	Community Wildlife Programmes (# planning)
19 KWS, Kabaret Station	Human settlement in NRS: 685 households/5,000 persons (1990), 650 households (1994), Difference of administering authorities (C.C.) for the adjacent NRS, Very bad road condition, Shortage of transport (1 vehicle)/plant/equipment (fire-arms, radios), No agreement for NR management between KWS/C.C.	Agreement for NR management for Rimoi NR with C.C.; KWS: NR management/development	None; because of lack of fund and no agreement for NR management with Baringo C.C.	Development of schools/clubs/cultural centre/cattle dips/water holes/ ostrich farms#
20 Baringo C.C.; Lake Bogoria Station	No conservation/tourism development plan with no fund for Lake Baringo, Bad road condition, Shortage of transport (1 vehicle, 1 lorry)/ plant/equipment (radios), Lack of scientific research/staff training (wildlife conservation/management, tourism)	5 Year Management Plan for NR (1991-96); made by C.C.	Research on vegetation/sol/hamings, Monitoring of animal populations, Special conservation programme for G. kudu#	Public service not only by NR revenue but also by other revenue sources, Cooperation for NR management between C.C./local communities, grazing permission in dry season by C.C., road maintenance/anti-poaching cooperation by local communities

Appendix A (11) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Tourism Development Visitor Condition (No./Year)	Visitor Carrying Capacity (No./Year)	Tourism Potential/Direction	Needs for Tourism Development	Other Information
(Coastal Tourism Region) 1 KWS: Lamu HQ	Few visitors in NRMNR. High season: August-December	More than the present	Up-market tourism. Conservation of sensitive Islamic traditional culture in Lamu/Pate Islands	Visitor services/education. Removal of tourist harassment	Private ranches in inland. Settlement scheme in Mpeketoni/Hindi/Murumbi by GTZ. Kiunga MNP/Doodoi NR management project by Holland/Germany/WWF (planning). Registration as Kiunga Marine Biosphere Reserve Registration as Malindi/Watamu Biosphere Reserve. Bamburi Nature Trail (private company) Support from Eden Wildlife Trust (NGO)
2 KWS: Malindi/Watamu HQ	30,000-40,000. No over-use	More than the present	Dispersal of visitors within MNP/MNR	Visitor services/education.	
3 KWS: Shimoni Station	30,000 (1990-93 Av.). High season: August-January. Low season: March-July. MNP admission fee: \$4. Cancellation of Marine Conservation Fee: \$2 22,377 (1993/94).	More than the present if the management plan implemented (possibly 40,000?)	Eco-tourism based on local communities. Conservation of sensitive Islamic traditional culture in Wasani Islands. Enhancement of scuba diving and discouragement of snorkeling		
4 KWS: Shimba Hills HQ	High season: August. December-January	More than the present if the management plan implemented (possibly 40,000?)	Eco-tourism based on local communities. No need for lodges but camping sites/bandas		Support from ODA (planning). Good condition on road network with sign posts in NR
5 KWS: Mombasa HQ	18,000 in MNP. Resumption of Marine Conservation Fee: \$2		Very high potential. No strategic development direction at present	Infrastructure development (roads, water supply, garbage collection, etc.). Beach cleaning. Removal of tourist harassment	
(Central Tourism Region) 6 KWS: Nanyuki HQ	Almost no visitors in NR		Up-market tourism. Environmentally sound tourism in private ranches. Examination of re-introduction of sport hunting	Infrastructure development. Communication network with private ranches	Private ranches occupying more than half of the district area. The name of "Kiunga NIP", instead of Laligala NR, was planned to be used once. Support for the wildlife community programme from USAID: COBEA project Pasture (must land) but no ranches around NRs. IBRD project by the World Bank (1982-83); almost no add/development after that. Good understanding for wildlife conservation by local communities. No security problem by intensification of KWS patrol
7 KWS/Isiolo C.C. Isiolo/Samburu Complex HQ	50,000-60,000.	More than the present		Construction of Information Centre. Improvement of game viewing road with close of minor road. Promotion/advertisement	

Appendix A (12) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Tourism Development Visitor Condition (No./Year)	Visitor Carrying Capacity (No./Year)	Tourism Potential/Direction	Needs for Tourism Development	Other Information
8 KWS: Mt. Kenya NP HQ	15,000-16,000	Possibly 2 times more than the present in this case, needs for review of the management plan	Diversity of tourism activities: mountain climbing, forest trekking, eco-safari, fishing, etc	Construction of Information Centre, Increase of camping sites and removal of temporal huts, Construction of roads to/from Chogoria gate to Mountain lake	Large-scaled agricultural land around Mt. Kenya FR, Resumption of "Shamba system" on plantation area in Mt. Kenya FR (1992); a kind of shifting cultivation, Registration as Mt. Kenya Biosphere Reserve
9 KWS: Aberdare NP HQ	67,510 (1994, 1-10)	Possibly 2 times more than the present	Control on visitor No.		Registration as Lake Nakuru Ramsar Site Expansion of agricultural land by private company (planning), Expansion of geo-thermal electric plant (planning)
10 KWS: Lake Nakuru NP HQ	170,000		Economic contribution to local communities		
11 KWS: Hell's Gate NP HQ	42,211 (1983); Domestic visitors 70 %, Mountain climbing > 50 %, Low season: April-May, November-January				
12 KWS: Embu HQ	300-400		High potential (?), Eco-tourism, Diversity of tourism activities: fishing, boating, etc.	Infrastructure development (roads, bridges, lodges, etc), Construction of water holes and clearing of a part of vegetation for visitor's attraction/facilities, Promotion/advertisement	Small-scaled agricultural land around NP, Tana-Afri River Development Authority project, Large-scaled irrigation scheme by private developer in the north of NP, Degazettement of a part of NP, from 68 to 48 sq.km, Support from Mwea NR Trust (NGO) No security problem by intensification of paim
13 KWS: Ol-Jorony NP HQ	2,800 (1989)	Much more than the present	Eco-tourism	Construction of lodges	
14 KWS: Nairobi NP HQ	150,000-160,000, No over-use	More than the present if facilities improved	Possibility of mass tourism, Environmental education/extension for Kenyans/school children	Construction of lodges/Masai Boma and camping/viewing sites with toilets, Improvement of Animal Orphanage/Information Centre, Visitor education with pamphlets, Promotion/advertisement to change the present image of zoo/transit	Industrial/agricultural development in the south of NP, Good condition on road network with sign posts in NP
(Western Tourism Region)					
15 KWS: Kisumu HQ	48,000 in LS (1982); Resident about 15,000, Non-resident about 12,000, Children 21,000, Free entrance; will be charged, Close to tourism in NP		Environmental education/recreation for local people in LS, Walking safari; no vehicle permitted	Establishment of Education Centre/nature trail/traditional fishing point/hippo watching point, Improvement of Animal Orphanage, Promotion/advertisement	Lake Victoria Basin Development Authority project, Government land in 100 ft. width along the lake shore

Appendix A (13) Results of Interview Survey to KWS and County Council Offices

Interviewed Organizations/Offices	Tourism Development		Tourism Potential/Direction	Needs for Tourism Development	Other Information
	Visitor Condition (No./Year)	Visitor Carrying Capacity (No./Year)			
16 KWS: Kakamega HQ	800 (1993); mostly naturalists/bird watchers/entomologists. More visitors in FR (Nature Reserves). Free entrance: will be charged (camping fee only) 2,400. Free entrance: will be charged after development	Possibly more than the present	Eco-tourism with environmental education	Construction of 2 camping sites/ 1 office/2 gates/2 bridges. Promotion/development with use of the Western Tourism Circuit	Agricultural land/settlements around NR. Permission to livestock grazing by the Presidential Instruction
17 KWS: Nasolot NR HQ			High potential. All year available to tourism. Scenic beauty on the way from Keru Valley/Lake Baringo to NRs. Eco-tourism. Diversity of tourism activities: safari, trekking, rock climbing, water sports, sport fishing, etc.	Establishment of lodges/bandels/ special camps/camping sites/gates. Improvement of game viewing road. Participation of private developers	Pasture (trust land) around NRs. Irrigation scheme by private developer in the south of NRs and by the government along Turkwel River (planting). Operation of hydro-electric plant with settlements by Kenya Power/Keru Valley Development Authority. Inclusion of Turkwel Gorge Arch Dam area (100 ca. sq.km) to NR (1993). Good condition on main road in Nasolot NR. No security problem
18 KWS: Mt. Elgon NP HQ	5,300 in Mt. Elgon NP (1989). 2,800 in Saisa Swamp NP (1989)		Diversity of tourism activities: mountain climbing, caving, bird watching, etc.	Construction of lodges/camping sites. Improvement of roads to form NRs. Removal of illegal settlements from NRs	Pasture (trust land) around NRs. Antipathy for gazettement of NP/NR by local communities. No security problem
19 KWS: Kabamer Station	50 in Kamburuk NR. Close to tourism			Construction of information/ Education Centres and boat jetty/ tented lodge/camping sites. Promotion/development in the set of Lake Baringo/Lake Bogoria NR	Pasture (trust/private lands) around NR. Good understanding for wildlife conservation by local communities. Hot injury of tourists by hot springs
20 Baringo C.C.: Lake Bogoria Station	40,000-50,000 in Lake Bogoria NR. High season: July-August, December		High potential: one of the most scenic beauty in Africa. Cultural diversity of traditional life with archeological sites: Kipchese, Boseri, Kipsaran. All year available to tourism. Local tourism and no mass tourism; gradual development by local administration. Diversity of tourism activities: camel/horse safaris, bird watching, star watching, hiking/trekking, rock climbing, cycling, water/ski sports, boating/canoes/fishing, sauna, filming/photography, etc.		

(Note) The blanks do not necessarily mean that there are nothing for these subjects but mean that there were simply no or lack of information obtained. As for the subjects for "Natural Environment", information obtained through field visits as well as interview surveys was used to fill in the blanks.

(Source) Interviews to KWS and County Council offices and field visits to NP/NR and other important areas by JICA Study Team.

**Appendix B. Field Survey: (a) Mammal Species and Numbers by Driving Counts,
(b) Bird Species Observed through Field Visits**

When the interview survey was made and time was allowed, NP/NR or other important areas were visited and field surveys, mainly driving counts and observations for mammals/birds, were carried out in most of these areas. In addition to this, the same kind of field surveys were made in several NP/NRs in other Tourism Regions and Tanzania.

(a) Mammal Species and Numbers by Driving Counts

The driving counts for mammals, especially large ones, were made in most of the total 16 NP/NRs (one in the Coastal, seven in the Central, three in the Western, one in other Tourism Region and four in Tanzania) during the short rainy season from the October, 1994 to early January, 1995. All animals seen on both sides along a road as far as 300 to 400 m were counted by at least two observers from a vehicle, which was driven at 30 to 40 km/hr. . As for Mt. Kenya NP and Kakamega NR, observation from a fixed point and by walking were alternatively used for reference, because of its forest habitat.

However, these data cannot be strictly compared with each other, because of variety of survey period, time and area. In other words the data indicate only a tendency of relative abundance in mammals. The areas which indicated abundant animals in number as well as species number were Masai Mara NR and Serengeti NR (Tanzania), followed by Lake Nakuru NP and Buffalo Springs NR. A total of 37 species were recorded in Kenya.

(b) Bird Species Observed through Field Visits

Bird species observed during the field visits were recorded in a total of 17 areas (two in the Coastal, four in the Central, five in the Western, two in other Tourism Regions and four in Tanzania) from late October to the middle of December, 1994.

Since the species were recorded whenever there was an opportunity for observing birds and time allowed, it depended rather on the remarkability of the species. As a result of this approach, forest or small birds were not well recorded. Thus, these data show only an example of the relative diversity of avifauna. A total of 113 species were recorded in Kenya and the areas where birds were abundant in species' number were Samburu/Shaba/ Buffalo Springs NRs and Lake Baringo.

The results of this survey are compiled in Appendix B(1)-B(7).

Appendix B (1) Results of Field Survey (a): Mammal Species and Numbers by Driving Counts

Tourism Region/Country	Coastal		Central		Samburu NP		Buffalo Springs NR		Mt. Kenya NP		Mwea NR		Nairobi NP	
	Area	(No.) (No./km)	Area	(No.) (No./km)	Area	(No.) (No./km)	Area	(No.) (No./km)	Area	(No.) (No./km)	Area	(No.) (No./km)	Area	(No.) (No./km)
Date	94.11.26		94.11.30		94.11.30-12.1		94.12.1		94.12.1-2		94.12.2		94.12.8	
Time (minutes)	6:45-10:00 (75)		10:30-12:20 (110)		16:20-18:05 (145)		9:15-11:50 (155)		18:40- 8:50- (240 ca.)		13:20-13:55 (35)		14:25-16:50 (145)	
Distance (km)	15.9		110		145		155		(fixed point)		35		145	
Species														
Reck-tailed Monkey					38.2		34.4		8.7		8.7		42.7	
Bue Monkey										2				
Vervet Monkey														
Black & White Colobus		5	0.07											
Baboons (Olive/Yellow)		79	1.04	7	0.30						10	1.15	28	0.66
Sub-striped Jackal														
Golden Jackal														
Black-backed Jackal														
Bat-eared Fox														
Large-spotted Genette														2
Small-spotted Genette														0.05
Deer/Mongoose														
White-tailed Mongoose														
Spotted Hyena			4	0.17										
Cheetah														
Lion														
Leopard					(6)		6	0.17						
African Elephant					(1)									
Burchell's Zebra		144	1.89	2	0.09	2	0.05		4	0.12	(2)			
Grey's Zebra														
White Rhinoceros		8	0.11						83	2.41				
Warthog	1	0.06												
Hippopotamus					2	0.09	2	0.06	3	0.09				15
Giraffe (M/Re/RO)		7 (Ro)	0.09	3 (Re)	0.13	1 (Re)	0.03		6 (Re)	0.17			25 (M)	0.59
Harebeest (Kongoni)											(1)	--	88	2.06
Wildbeest														
Top														
Impala		769	10.12	1	0.04	90	2.59	150	4.36		20	2.30	154	3.61
Grant's Gazelle				28	1.21	3	0.08	120	3.49				64	1.50
Thomson's Gazelle		39	0.51										22	0.52
Genetuk				3	0.13	5	0.13	16	0.47					
African Buffalo		89	1.17										3	0.07
Bland														
Greater Kudu														
Bushbuck														
Harvey's Red Dukker														
Sable Antelope		30	1.89										15	0.35
Oryx (B)														
Dikalis (Kiri's/Gunthers)				61	2.64	2	0.05	104	3.02					
Waterbuck (C/D)				75	1.96									
Unstriped Ground Squirrel		202 (D)	2.66	3 (C)	0.13	36 (C)	0.94	7 (C)	0.20				12 (D)	
Total No. & No./km	31	1.95	1518	19.97	114	4.94	230	6.02	500	14.55	92	3.45	416	9.74
Species No.	2		10		13		13		12		7		3	10

Appendix B (2) Results of Field Survey (a): Mammal Species and Numbers by Driving Counts

Area	Western		Masai Mara		Tanzania		Ngorongoro CA		Serengeti NP	
	(No.)	(No./km)	(No.)	(No./km)	(No.)	(No./km)	(No.)	(No./km)	(No.)	(No./km)
Kakamega NR	3									
Nasoiot NR										
94.12.14	94.12.15	94.11.7	94.11.8	94.11.9	94.11.9-11	94.11.9-11	94.11.9	94.11.9	94.11.9-11	94.11.9-11
14:30-16:00	13:10-15:00	11:55-12:45	11:00-13:00	9:00-11:30	14:15-17:30	14:15-17:30	9:00-11:30	9:00-11:30	8:45-16:00	8:45-16:00
(90)	(110)	(100)	(120)	(150)	(120)	(120)	(150)	(150)	9:00-11:30 (780)	9:00-11:30 (780)
Minutes	110	100	120	150	120	120	150	150	780	780
Distance (km)	33.5	20.3	30	61	37	37	61	61	252	252
Species										
Red-tailed Monkey										
Blue Monkey										
Vervet Monkey										
Black & White Colobus										
Baboons (Olive/Yellow)										
Side-striped Jackal										
Golden Jackal										
Black-backed Jackal										
Bat-eared Fox										
Large-spotted Genette										
Oryx/Mongoose										
White-tailed Mongoose										
Spotted Hyena										
Cheetah										
Lion										
Leopard										
African Elephant										
Burchell's Zebra										
Grey's Zebra										
White Rhinoceros										
Warthog										
Hippopotamus										
Giraffe (N/R/ro)										
Hartebeest (Kongoni)										
Wildebeest										
Topi										
Impella										
Giant's Gazelle										
Thomson's Gazelle										
Genetuk										
African Buffalo										
Eland										
Greater Kudu										
Bushbuck										
Honey's Red Duller										
Sable Antelope										
Oryx (B)										
Dikdik (Kirk's/Gunther's)										
Waterbuck (C/O)										
Unstriped Ground Squirrel										
Total No. & No./km	6	0	107	5.27	163	5.43	372	10.05	573	9.39
Species No.	2	0	8	18	6	13	4	13	7031	27.50

(Note) "No." in parenthesis means animals observed out of the census time/routes.

"Total No." means all animals counted only in the census time/routes.

"Species No." includes species observed out of the census time/routes.

(Source) JICA Study Team

Appendix B (3) Results of Field Survey (b): Bird Species Observed through Field Visits

Tourism Region/Country Area	[Coastal]		[Central]		[Western]			[Others]			[Tanzania]						
	MOM	LAM	NAK	NAK	SSB	NAI	KIS	KAK	NAS	BAR	BOG	MAS	TSE	ARU	MAN	NGO	SER
Date (94.)	11.23	11.21	10.28	12.1	11.30	12.8	12.13	12.15	12.16	12.16	12.17	10.28	11.26	11.7	11.8	11.9	11.9
	11.26	11.22		12.2	12.1		12.14		12.17	12.17							11.11
[OSTRICH]																	
Ostrich					+							+					+
[FELICANS]																	
White Pelican																	+
[CORMORANT]																	
Greater Cormorant							+										
[HERONS/EGRETS]																	
Grey Heron																	+
Goliath Heron																	
Black-headed Heron																	
Squacco Heron																	
Cattle Egret																	
Little Egret																	
[HAMERKOP]																	
Hamerkop																	
[STORKS]																	
Open-billed Stork																	
White Stork																	
Marabou																	
Yellow-billed Stork																	
[IBISES]																	
Sacred Ibis																	
[FLAMINGOS]																	
Lesser Flamingo																	
Greater Flamingo																	
[DUCKS/GEESE]																	
White-faced Whistling Duck																	
Egyptian Goose																	
Spur-winged Goose																	
Red-billed Teal																	
[SECRETARY BIRD]																	
Secretary Bird																	

Appendix B (4) Results of Field Survey (b): Bird Species Observed through Field Visits

Tourism Region/Country Area	[Coastal]	[Central]	[Western]	[Others]	[Tanzania]	NGO	SER									
	MOM	LAM	NAK	KEN	SSB	NAI	KIS	KAK	NAS	BAR	BOG	MAS	TSE	ARU	MAN	
[VULTURES/EAGLES]																
African White-backed Vulture						+							+			
Egyptian Vulture												+				
Lappet-faced Vulture		+											+			
White-headed Vulture																
Bateleur		+														
Tawny Eagle																
Augur Buzzard																
Long-crested Eagle																
Dark Chanting Goshawk																
Fish Eagle																
Black Kite																
Black-shouldered Kite																
[FALCONS]																
Peregrine Falcon																
White-eyed Kestrel																
[FRANCOLINS]																
Yellow-necked Spurfowl																
Scaly Francolin																
[GUINEAFOWL]																
Vulturine Guineafowl																
Helmeted Guineafowl																
[CRANES]																
Crowned Crane																
[BUSTARDS]																
Black-bellied Bustard																
White-bellied Bustard																
Kori Bustard																
[JACANAS]																
Jacana																
[PLOVERS]																
Kirititz's Sandplover																
Blacksmith Plover																
Crowned Plover																
Spur-winged Plover																

Appendix B (5) Results of Field Survey (b): Bird Species Observed through Field Visits

Tourism Region/Country Area	[Coastal] MOM	[Central] NAK	KEN	SSB	NAI	[Western] KIS	KAK	NAS	BAR	BOG	[Others] MAS	TSE	ARU	[Tanzania] MAN	NGO	SER
[SNIPES]																
African Snipe																
[STILTS]																
Black-winged Stilt																
[THICKNESS]																
Stone Curlew																
[GULLS/TERNs]																
Sooty Gull																
White-cheeked Tern																
[SKIMMERS]																
African Skimmer																
[PIGEONS/DOVES]																
Speckled Pigeon																
Red-eyed Dove																
Laughing Dove																
Emerald-spotted Wood Dove																
[PARROTS]																
Brown Parrot																
Orange-bellied Parrot																
[TURACOS]																
Hartlaub's Turaco																
White-bellied Go-away Bird																
[COCKOOS/COUCALS]																
Red-chested Cuckoo																
White-browed Coucal																
[SWIFTS]																
Little Swift																
White-rumped Swift																
Palm Swift																
[MOUSEBIRDS]																
Speckled Mousebird																
[KINGFISHERS]																
Brown-hooded Kingfisher																
[BEE-EATERS]																
Carmine Bee-eater																

Appendix B (6) Results of Field Survey (b): Bird Species Observed through Field Visits

Tourism Region/Country Area	[Coastal]	[Central]	[Western]	[Others]	[Tanzania]	SEK											
	MOM	LAM	NAK	KEN	SSB	NAI	KIS	KAK	NAS	BAR	BOG	MAS	TSE	ARU	MAN	NGO	SER
[HOOPoes]																	
Hoopoe																	
[HORNbILLS]																	
Silvery-cheeked Hornbill																	
Black & White Casqued Hornbill																	
Von der Decken's Hornbill																	
Red-billed Hornbill																	
Yellow-billed Hornbill																	
Ground Hornbill																	
[SWALLOWs]																	
Striped Swallow																	
[DRONGOS]																	
Drongo																	
[ORIOLES]																	
Black-headed Oriole																	
[CROWS]																	
Pied Crow																	
Indian House Crow																	
Fan-tailed Raven																	
[CUCKOO SHRIKES]																	
Black Cuckoo Shrike																	
[BULBULs]																	
Common Bulbul																	
[THRUSHES/ROBINS]																	
White-browed Robin Chat																	
Northern Olive Thrush																	
Bare-eyed Thrush																	
[FLYCATChERS]																	
Southern Black Flycatcher																	
[WAGTAILs]																	
African Pied Wagtail																	
Yellow Wagtail																	
[BUSH SHRIKES]																	
Black-headed Gonolek																	
Rosy-patched Shrike																	

Appendix B (7) Results of Field Survey (b): Bird Species Observed through Field Visits

Tourism Region/Country Area	[Coastal] MOM	[Central] LAM	[Central] NAK	KEN	SSB	NAI	[Western] KIS	KAK	NAS	BAR	BOG	[Others] MAS	TSE	ARU	MAN	NGO	SER
[SHRIKES]																	
Grey-backed Fiscal																	
[HELMET SHRIKES]																	
White-crowned Shrike																	
[STARLINGS/OXPECKERS]																	
Blue-eared Glossy Starling																	
Ruppell's Long-tailed Grossy Starling																	
Supero Starling																	
Yellow-billed Oxpecker																	
[SUNBIRDS]																	
Maniqua Sunbird																	
Variable Sunbird																	
[WEAVERS, etc.]																	
Red-headed Weaver																	
Red-naped Widowbird																	
Yellow Bishop																	
Baglafecht Weaver																	
Golden Palm Weaver																	
Black-headed Weaver																	
Masked Weaver																	
Spectacled Weaver																	
Golden Weaver																	
White-billed Buffalo Weaver																	
White-headed Buffalo Weaver																	
White-browed Sparrow Weaver																	
Grey-headed Sparrow																	
Rufous Sparrow																	
Jameson's Firefinch Indigobird																	
[WAXBILLS, etc.]																	
Red-billed Firefinch																	
Red-cheeked Cordon-bleu																	
Black & White Mannikin																	
Species No.	13	15	13	5	28	22	8	3	2	26	18	14	7	2	9	9	13
Regional/Country Total	(Coastal) 26	(Central) 58	(Western) 47	(Others) 21	(Tanzania) 22												

(Note) MOM: Mombasa, LAM: Lamu/Manda Islands, NAK: Lake Nakuru NP, KEN: Mt. Kenya NP, SSB: Samburu/Shaba/Buffalo Springs NRs, NAI: Nairobi NP/Nairobi, KIS: Kisumu, KAK: Kakamega NR, NAS: Nasolot NR, BAR: Lake Baringo, BOG: Lake Bogoria NR, MAS: Masai Mara NR, TSE: Tsavo East NP, ARU: Arusha NP, MAN: Manyara NP, NGO: Ngorongoro CA, SER: Serengeti NP

(Source) JICA Study Team

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