

WORLD BANK

**Proposal and Recommendations
for the Review of the
Development Loan Committee**

KENYA - LIVESTOCK PRODUCTION

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

UNCLASSIFIED

AID-DLC/P-2024

April 26, 1974

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Dollar Development Loan
Kenya - Livestock Production

Attached for your review are the recommendations for authorization of a loan to the Government of Kenya not to exceed \$9,600,000 to assist in financing the foreign exchange and local currency costs of livestock, equipment, materials, construction services, technical services and related service for northeast Kenya range development, Agricultural Finance Corporation subloans and domestic market surveys.

This loan proposal is scheduled for consideration by the Development Loan Staff Committee on Thursday, May 2, 1974. Also, please note your concurrence or objection is due by close of business May 7, 1974. If you are a voting member, a poll sheet has been enclosed for your response.

Development Loan Committee
Office of Development
Program Review

Attachments:

Summary and Recommendations
Project Analysis
ANNEXES I - XV

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KENYA LIVESTOCK LOAN

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Exchange Rates: 2.8 Ksh = \$1 U.S.
7.1 Ksh = \$1 U.S.

KENYA - Livestock Development Project

I. Summary and Recommendations

A. Borrower: The Government of Kenya (GOK)

B. Amount of Loan: \$9,600,000

C. Terms

1. Maturity: Forty (40) years, including a ten (10) year grace period.

2. Interest: Two (2) percent per annum during the grace period and three (3) percent per annum thereafter.

D. Total Cost of Project (Million of dollars)

	<u>Foreign Exchange</u> ^{1/}	<u>Local Cost</u>	<u>Total</u>	<u>%</u>
AID	3.2	6.4	9.6	18
IDA	7.6	13.9	21.5	43
Other Donors ^{2/}	2.9	1.3	4.2	9
GOK ^{3/}	-	15.1	15.1	30
	<u>13.7</u>	<u>36.7</u>	<u>50.4</u>	<u>100</u>

^{1/} Foreign exchange figure for IDA and other Donors is based on IDA method of calculating FX which treats all goods with origin outside of Kenya as foreign exchange cost.

^{2/} ODA and CIDA (See Section III for details).

^{3/} Includes contributions from private ranchers.

B. Description of Project:

The proposed multi-donor Project would extend credit through the Agricultural Finance Corporation (AFC) for the development about 60 group ranches, 100 commercial ranches, 21 company or cooperative ranches and three feedlots. It would also provide for the development of seventeen million acres of rangeland* by providing water facilities and access roads. Marketing facilities would also be extended through establishment of new markets, upgrading of existing holding grounds and improvement of stock routes, the setting up of new holding grounds and the augmenting of transportation facilities. Three wildlife areas would be developed to help overcome the resource competition with livestock, and a livestock census and monitoring unit would also be included in the Project to improve technical knowledge in this field. Finally, the Project would provide for technical services, training, Project monitoring and evaluation, and for future project preparation. AID financing would be limited to equipment and supporting services for the Northeast Province rangeland development (\$5.3 million), cattle purchases for a portion of the ranching program (\$4.1 million) and a meat processing feasibility study (\$200,000).

F. Project Purpose:

To increase the quantity and quality of livestock production to meet growing domestic demand and to earn foreign exchange through exports of livestock and livestock products. In so doing, the total Project will directly benefit pastoralists and other small cattle owners and wage employees on commercial and company ranches, in meat marketing, wildlife and range water development. In addition, higher prices for beef (an undertaking negotiated between IDA and GOK) would transfer income directly from relatively prosperous urban consumers to the lower income rural producer. The AID portion of the Project will contribute significantly to the conservation of Northeast Province rangeland as well as result in higher incomes for beneficiaries of the range and ranch development programs through increased livestock production.

G. Background:

The proposed Project, coordinated by the IBRD and based on the findings of an IDA appraisal mission to Kenya in October-November 1972, builds on and expands the scope of the First Livestock Project, initiated in 1968, which had as its principle objectives the increase of beef production by providing credit for ranching enterprises, establishing livestock marketing facilities, rangeland development and disease control. External financing of the First Project was provided by joint IDA and SIDA (Sweden) funding (\$3.6 million each).

AID, since 1970, has been providing grant-funded technical assistance which is closely-tied to the IDA/SIDA First Livestock Project. In particular AID has assisted successful efforts to improve range management and water development in a pilot area of northeast Kenya and in making management and fiscal improvements in the operations of the Agricultural Finance Corporation (AFC). Technical assistance being provided under the National Range and

* 14 million acres in Northeast Province and 3 million acres in Isiolo District.

Ranch Development Project, approved by AID in June 1972, will be an essential part of the Second Livestock Project. The proposed loan is viewed as a means of responding to a recognized priority need of the GOK and of complementing AID's technical assistance efforts in livestock.

H. Ex-Im Bank Clearance:

Clearance received.

I. Country Team:

The Country Team strongly endorses this project.

J. Statutory Checklist:

Satisfied. See Annex I.

K. Recommendation:

Authorization of a loan not to exceed \$9.6 million to finance foreign exchange and a portion of the local costs associated with ranch and rangeland development and a meat processing feasibility study.

PROJECT COMMITTEE:

REDSO/EA

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Livestock Advisor
Engineer
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II. INTRODUCTION AND PROJECT RATIONALE

A. Background to the Project

Kenya is rapidly developing country with an average annual rate of increase in the Gross Domestic Product (GDP) in real terms for the past eight years of over 6.5%. While exports (recently over 25% of GDP) have risen steadily, the demand for imports is high, even under government control, with the result of a deteriorated trade balance. This has necessitated substantial inputs of concessional foreign assistance to maintain the economy's momentum. (See Annex IV.)

While agriculture accounts for 31% of GDP, livestock production represents only a small proportion of this. With four/fifth's of Kenya in rangeland, and an estimated national cattle population of 9,000,000, considerable potential exists to further develop the livestock and associated wildlife subsectors.

Most of the international donor agencies active in Kenya have recognized livestock as a major national resource for some time. A.I.D. has taken a very specific role since 1970 with its grant-funded technical assistance. Assistance through FY 82 under the National Range and Ranch Development Project as presently programmed, will approach \$5 million total. Present and planned A.I.D. assistance to Kenya takes cognizance of the historical experience and existing capabilities of the United States in the livestock field; U.S. Department of Agriculture under PASA is currently providing experts from the Forestry Service who have dealt for years with problems similar to the Kenya context.

The World Bank, through its IDA subsidiary, is the largest donor, both to the livestock sector and for all aspects of Kenya development. IDA initiated its involvement in livestock in 1968 together with Sweden with the Phase I project. Contributions were \$3.6 million each from IDA and Sweden (63%) and \$2.1 million equivalent (37%) from the GOK principally as well as benefitted farmers/ranchers. With minor exceptions, funds were channeled through the Agricultural Finance Corporation (AFC) which was given organization and management responsibility for the joint project. ^{1/}

The Phase I project was not without its problems: delays in land adjudication, lack of qualified staff, and AFC organization. IDA does, however, consider the Phase I effort to have been a success, having broken new ground in making credit available to pastoralists and small herd owners and encouraging the Kenya Government (GOK) to prepare a larger and more comprehensive Phase II project. Funds under Phase I were fully committed one year ago and are virtually fully disbursed.

^{1/} The AFC General Manager and the head of its Ranch Section during this period were American experts funded by A.I.D.-grant assistance. The post of General Manager was subsequently Kenyanized.

IDA fielded an Appraisal Mission in October - November, 1972 to consider the feasibility of follow-on assistance. The USAID/Kenya project manager for the NRRD project participated in the Mission as a consultant. On the basis of the potential findings of the Appraisal Report, IDA solicited participation in joint or parallel financing for Phase II from Canada (CIDA), United Kingdom, and the United States, and negotiated a loan agreement (subject to IDA Board approval) in July, 1973. GOK formally requested A.I.D. assistance in its application for a \$10 million loan dated April 21, 1973.

B. Project Rationale

1. General

The principal recommendation in the IBRD's Basic Economic Report on Kenya (January 1974) is that to achieve rapid growth while at the same time increasing employment and incomes, there must be a significant change in Kenya's recent pattern of growth which has been impressive in macro-economic terms but which has not been accompanied by significant gains in income distribution and employment creation. To this end, the Bank recommends a progressive shift toward export promotion with greater emphasis on agriculture where Kenya has a comparative advantage and on related processing industries. The Second Livestock Development Project with its focus on increasing livestock production (particularly by low-income producers) is consistent with this strategy. Further, as an important catalyst to increasing the amount of quality beef available for export as well as to eliminating a system which currently subsidizes higher income urban dwellers with low cost beef at the expense of greater return to rural producers, the Bank has negotiated an agreement with the GOK for removal of all price controls on beef over a three-year period.

The functional element of the overall Phase II project is discussed in more detail in Section III below. Basically, the Second Project would assist ranch development, range water development, livestock marketing and wildlife conservation. These efforts seek to address certain basic aims, many of which have already been well stated in the PROP for NRRD (Project 615-11-190-157) dated April, 1972.

First, from the standpoint of economics alone, Phase II livestock development should yield significant incremental foreign exchange, either directly through export of premium beef to European and other wealthy markets or indirectly through provisioning of the fast growing (but demanding) tourism market within country. IDA estimates the net foreign exchange generated by the Project at maturity in the mid 1980's at \$7 million annually; while A.I.D.'s estimates of FX earnings potential are somewhat more conservative due to an assumption of higher domestic demand for beef, the net effect to Kenya's trade and payment balance will be positive.

A second set of aims is the improved economic well being of individual Kenyans, mostly at or near the bottom of the development "ladder." Phase II seeks to benefit the consumer by providing more animal protein at fair prices and stable supply through both an absolute increase in beef, sheep and goat production and pricing policies which will stimulate efficient production of quality poultry and pork alternatives. Employment in allied industries -- marketing, feedlots, slaughter, and exporting -- will be created with up to 5,000 permanent new jobs. Even more meaningfully, the incomes of approximately 50,000 persons on AFC-assisted ranches and 42,400 pastoralists on open range with improved water facilities and better access to markets will be significantly increased as a result of Phase II. Together with the NRRD project, this Project will markedly improve the ability of AFC and the Ministry of Agriculture to respond to the small ranchers' and the isolated pastoralists' need for more credit and technical guidance.

Finally, the Phase II project will help contribute to major non-economic objectives of the GOK. First among these is to settle the semi-nomads of the Northeast (Somalis) and the south (Masai) and bring these pastoralists into the mainstream of the national life. By providing new water supplies and improved rangeland, Kenya will be able to more easily and efficiently provide other social infrastructure such as schools and highways. A stable, prospering population -- while not really quantifiable in economic terms -- will have the added benefit of providing better national integrity in Kenya's border areas. Another aim of the Project with both "social" and economic implications is long-term conservation of Kenya's invaluable wildlife resource. A discreet element of the Project will improve and/or expand three major national parks as well as establish a wildlife/livestock monitoring unit to collect baseline data and indicate future policy requirements. In this way it is felt that the inherent competition between wildlife and livestock can be kept in balance, essentially to the benefit of the wildlife.

2. A.I.D.-Financed Project Components

A.I.D.'s financing will be limited to development of the Northeast Province rangeland and a portion of the credit program for ranch investment. Total range areas (including location of proposed ranches) occupy 122 million acres or more than 80 percent of Kenya's land area. The entire grazing area has a population of approximately 1.5 million, most of whom are pastoralists or semi-pastoralists subsisting outside the monetized economy.

Only a small area of the rangeland has been developed by commercial ranchers; the great proportion of all grazing lands has lagged far behind in technical and social advances. Mismanagement, overgrazing and lack of water development and roads have led to range deterioration through bush encroachment and overstocking. Further, the combination of slow maturing, poor quality animals, high mortality rates, poor animal husbandry and range management practices have resulted in low quality, quantity and value of production. In this situation, the GOK has recognized the urgent need for range and water development. The pilot project undertaken in 1970 with A.I.D.

technical assistance and focussed in one section of the Northeast Province has achieved considerable success and gives much promise for extending the program during this phase to the balance of the Northeast Province. A.I.D.-financed technicians (range planners, agricultural engineers and hydrogeologists) have also been assisting in planning for range development in the areas where group and commercial ranches are being established.

The range areas' options for alternative utilization are extremely limited. Development means range and water improvement, which in turn, means increasing livestock outputs. Such development will not only increase cash incomes of the pastoral and ranch people but also will improve nutritional levels because the food supply for these people comes largely from their livestock. As a "bonus," the building of access roads and "tracks" in the grazing blocks will be of considerable benefit to communication and social development.

The pastoral people targeted by the A.I.D. Project are the Masai in the ranching areas and the Somalis in the Northeast Province. Indications are that these people are receptive to the development programs proposed.

Because the Masai remain so independent on their cattle, the group-type ranch is being formed where land and financing transactions can be arranged on a large scale, as a group, with each family retaining individual ownership of its cattle. The experience with the Masai group ranches in Kajiado District during the initial phase of the Livestock Development Project demonstrates their acceptance of dipping programs, formal land tenures, need to improve their herds through the purchase of better bulls, planned sales of steers and culling of unproductive animals.

Somali understanding and acceptance of the Northeast range management program has so far been excellent, primarily, one must assume, because following extensive study of the area, the grazing system has been fitted as nearly as possible to existing cultural and grazing practices and the grazing blocks defined in terms of tribal distribution. In addition, extensive effort has been made and will continue to be stressed with respect to acquainting the Somalis with the system and its benefits both with classroom instruction at the Giriftu Pastoral Training Center and through constant contact by the Block Managers.

C. Borrower

The Borrower will be the Government of the Republic of Kenya, acting through its Treasury. In the case of the Northeast Province range development sub-project to be financed under the A.I.D. loan, the Ministry of Agriculture's Water and Range Management Divisions will serve as the implementing agencies. The portion of the A.I.D. loan to be used for ranch development will be subloaned through the Agricultural Finance Corporation.

III. The Project

A. General Description of Total Project:

The Second Livestock Development Project is a broadly-based integrated sub-sector program intended to increase beef production in Kenya over five years through ranch and range development and the general improvement of essential production and marketing infrastructure. It would also provide for wildlife conservation and development. The following elements would be included in the five-year Project:

1. Ranch and Feedlot Development

a. Extension of credit through the Agricultural Finance Corporation for development of about 60 group ranches, 100 commercial ranches and 21 company and cooperative ranches; to be financed jointly by IDA and AID. See Section B2 below for further detail.

b. Development of three feedlots outside the disease-free zone with a capacity of 1600 head in yards and an additional 1600 head on improved pastures; to be financed by IDA through the AFC.

2. Rangeland Development

Development of approximately 14 million acres of communal grazing land in the Northeast Province (AID financing) and about 3 million acres in Isiolo District (Canadian financing) through provision of water facilities and access roads. More detail on development of the Northeast Province is provided in Section B1.

3. Livestock Marketing

To address the problem of inadequate marketing facilities for cattle from the rangeland areas, the Project, with U.K. financing, would develop 5 large (capacity 500 head a day) and 26 small (capacity 200 head a day) cattle markets on existing or new holding grounds. It would also develop three small markets for sheep and goats. The Project would provide pens, simple livestock handling facilities, office building, stores, water facilities and weighbridges. The Project would develop about 30 new holding grounds with total area about 200,000 ha. These would range in size from about 80 to 35,000 ha and would be located at strategic points on the existing stock routes network. The Project would provide for bush clearing, boreholes, storage tanks, water points and stock handling facilities. Financing would also cover two veterinary laboratories, two small boat jetties vehicles and operating costs for three years. The Project would provide 5 cattle trailers (72 head/train) and 10 cattle trucks (32 head/truck) and 12 pick-up trucks over three years. Cattle trailers

would be used to transport cattle from the Northeast and the cattle trucks mainly for transporting cattle from Kajiado and Narok districts. All markets, stock routes, holding grounds and transport equipment will be owned and operated by LMD. (See Annex V for a discussion of livestock marketing in Kenya.)

4. Wildlife

a. Amboseli and Masai Mara Park Development. Because of its rich wildlife resources and its potential as a tourist resort, the Government will convert Amboseli game reserve to a national park and extend the Masai Mara reserve. As certain areas would be reserved solely for wildlife, the result would be that cattle owners would be deprived of dry season water supplies. The Project with GOK and IDA financing would compensate for these restrictions on livestock movement by providing water from present sources within the reserves to surrounding areas. Basic inputs would be 90 km of water pipelines, 220 water tanks, pumping equipment, vehicles, and operating costs for four years. Under the land adjudication program, the rangelands in the vicinity of the game reserves are rapidly being developed for beef production. Wildlife in these areas would be endangered unless the cattle owners agree to allow the unrestricted movement of the game across the cattle ranches. The Government has agreed that cattle owners on group ranches in the Amboseli and Masai Mara ecosystems should share in the revenues from game.

b. Nairobi Park Development. Nairobi Park is to be extended to include an additional 350 km² within the park boundary. This extension would establish the park boundary, thus making livestock development within and around the boundary feasible. Some of this area to be included has already been adjudicated and a group ranch formed. As compensation for allowing the ranch area to be utilized as a park as well as for cattle production, agreement has been reached whereby part of the fees collected by the park would be paid to the group ranch members. Project investments in entry gates, roads, game barriers, staff housing and vehicles would complete the development of the park and the demarcation of these wildlife and livestock areas.

5. Census and Monitoring Unit. With Canadian financing, the Project would establish a census and monitoring unit to provide up-to-date baseline data on wildlife, livestock, and cultivation in pastoral areas. Information would then be available for identification of livestock development areas together with the ability to assess possible conflict with wildlife population. Items provided would include an initial aerial survey, one aircraft for monitoring, vehicles, weather equipment, a senior scientist and supporting personnel. The Game Department of the Ministry of Tourism and Wildlife would be responsible for carrying out the wildlife component of the Project, including provision for census and monitoring.

6. Technical Services

Technical services to be provided under the Project would include:

- a. Livestock Marketing Division. Supplemental supporting staff (i.e. a senior buyer, a transport officer, five maintenance supervisors, and an accountant) and operating expenses for three years. (U.K. financing)
- b. Agricultural Finance Corporation. A Kenyan counterpart for Head of AFC Ranch Section, three accountants, fourteen livestock/credit officers and other supporting staff to meet the operational needs of the Project. (IDA financing). See Section VIIA for technical assistance presently being provided by AID.
- c. Meat Processing. Technical services (consultants) to assist the Government in carrying out a study of meat processing in Kenya. (AID financing)
- d. Veterinary Services. A pleuropneumonia mobile testing unit housing, vehicles and field equipment, three veterinary officers, supporting staff and operating expenses. (IDA financing)
- e. Training. Training (four 2-year overseas fellowships) for technical staff and provision for study tours or consultancy for disease control. (IDA financing)
- f. Project Coordination Unit. This Unit has already been established in the Ministry of Agriculture to coordinate and supervised Project operations. Under the directions of a Project Director, Assistant Project Director and supporting staff, it has responsibility for ensuring that Project-related investigational work, Project evaluation, and monitoring are carried out. (IDA financing)
- g. Equipment Management and Maintenance. Four Technicians for management and maintenance of equipment to be used for Northeast development (AID financing) See Section IV for details.

7. Operating Expenses and Working Capital

The Project would include incremental working capital requirements for ranch development, based upon 100% of steer purchases and 50% of operating costs for the initial one to three years of development. The Project would also cover: LMD incremental operating costs for the first year, excluding technical services and cattle purchases; the first four years of operating costs for wildlife

development, range water development, veterinary services; and incremental operating costs incurred by AFC under the Project. Each of these is treated as a development cost while necessary expertise is built up.

Financing of Project costs would be shared in the following amounts and proportions: (million of dollars):

Project Component	Private Beneficiaries	%	Government	%	Foreign Credits					Total %	Total	
					IDA	U.S.	Canada	U.K.	Total			
Ranch Development	6.3	20	3.17	10	18.53	4.10				22.63	70	32.10
Range Water Development												
Isiolo District			.26	27			.70			.70	73	.96
Northeast Province			2.50	32		5.30				5.30	68	7.80
Livestock Marketing			1.27	30				2.90		2.90	7	4.17
Kenya Meat Commission						.20				.20		.20
Wildlife Censusing and Monitoring			.34	36			.60	.60		.60	64	.94
Nairobi, Amboseli and Masai Mara Parks			.54	30	1.26					1.26	70	1.80
Veterinary Services			.16	30	.39					.39	70	.55
Research and Technical Services			.16	30	.40					.40	70	.56
Project Coordination Unit			-	-	.22					.22	100	.22
AFC			.32	31	.70					.70	69	1.02
	6.3	13	8.72	17%	21.50	9.60	1.30	2.90		35.30	70	50.32

B. Description of Project Components Proposed for A.I.D. Financing

1. Rangeland Development (Northeast Province)

a. Background (Annex VI)

The Northeastern Province, with a surface area of about 31.3 million acres, comprises 21 percent of Kenya's total area. It is mostly semi-desert country suitable only for grazing. The southern extremity of the Province receives nearly 25 inches of rainfall, but the bulk of the Province is arid to semi-arid, with annual rainfall of only 10 to 15 inches. Normal weather in the Province provides two wet seasons and two dry seasons annually. Each wet-dry weather cycle is normally sufficient to permit forage plants to develop and mature, although almost a total failure of rains in one season and occasionally of both may be experienced causing periodic drought, especially in small local areas. Narrow front thunder showers often occur which produce rapid runoff which must be captured to avoid loss.

The topography is mostly flat with elevation ranging from less than 600 feet to about 1,600 feet. Daily maximum temperatures are usually in the high 80's or low 90's. The people living in the Province (pastoralists, mostly of Somali origin) depend almost entirely on livestock for their livelihood. The Province presently contains approximately 600,000 cattle (zebu type), 176,000 camels, 163,000 sheep and goats, and 135,000 donkeys.

In June 1970, a detailed development plan for approximately 1.8 million acres of the N.E. Province was completed by the Kenya Ministry of Agriculture and a USAID Range Development (Water) Project team. That area corresponds to grazing blocks 1, 2, and 3 in the Northeast Province (NEP). This area served as the pilot area and was completed in 1973. The pilot study was supplemented in 1971 with plans for completing range development on approximately 15 million acres in the Northeast Province.

b. Range Management

Northeast rangelands are the principal source of immatures for fattening elsewhere in Kenya. With minimum water, grazing development and appropriate management, previous experience indicates that carrying capacity can be increased from 89 acres/AUY to about 40 acres/AUY, where an AUY is defined as an 800 pound cow or equivalent whose daily forage requirement is 20 pounds air dry weight and water requirement is 8 U.S. gallons per day. Under this project cattle numbers in the benefited areas are projected to increase from 212,980 to 352,882 in year 20.

1/ Development Plan and Feasibility Study on a Pilot Range Development Project, Northeast Province, Kenya, 1970

2/ Grazing blocks are in effect management units based on forage, topographic and hydrologic features and designed to accommodate tribal distribution and local needs to the fullest extent possible.

The current land-use pattern by cattle is "water oriented"; with the nomadic herdsmen following the rain with their cattle during the rainy season and retreating back to the seriously depleted ranges adjacent to the widely separated permanent water sources for the duration of the dry season. With the implementation of planned water development, and good range management, stabilized livestock production is possible.

The range development plan for the Northeast Province is based on locating water points within reasonable distance to areas producing suitable livestock forage and in sufficient amounts to maintain cattle herds in balance with the forage supply. The type and location of water points are keyed to the grazing scheme to be used and are planned to minimize the need for enforced movement of cattle from pasture to pasture (Annex VI).

Permanent water facilities consisting of either boreholes or large (5 million gallon) and medium (3 million gallon) reservoirs will be constructed on a grid of approximately 15 miles, with smaller temporary reservoirs (0.5 million gallon) interspersed. Large and medium reservoirs will be located in pastures to be grazed primarily during dry season. They will be constructed to collect and store sufficient water through the preceding twelve to fifteen months period to normally provide adequate livestock water for the full cattle stocking schedule for the pasture during the season it is scheduled for use in the grazing treatment sequence. These pans are planned to supply adequate water within a reasonable distance of suitable quality and quantity forage to provide up to about 150 days grazing when necessary. Small (temporary) reservoirs will be located in pastures designated principally for wet season grazing, during and immediately following the rainy seasons. These reservoirs will be constructed for the purpose of storing sufficient water to normally provide for the full cattle numbers scheduled for the designated pasture during the rainy season and for six weeks or more following the rain.

Management of the range will be based on a rest/rotation grazing scheme. Under this scheme, each grazing block is divided into eight pastures with six of the eight pastures scheduled to be grazed some time during each wet-dry season cycle. On average, three pastures are grazed during the wet season and three during the dry season. Usually two pastures (one wet and one dry season pasture) are rested throughout each wet-dry cycle. This system, combined with the proper placement of water points, is designed to control "where" and "when" grazing occurs, thus providing sufficient deferment and rest for range forage to maintain its health and productivity.

The expectation for effective range management which underlies this project is based in large part on having designed the grazing blocks and the grazing scheme to fit as nearly as possible with tribal distribution and what is known of the socio-cultural needs and behavior of the Somali herdsmen.^{1/} Careful attention is also being given

1/ The development plan for the area reflects, for example, the findings of a 1969 GOK-sponsored study by Dr. Robert J. Chambers of the social structure, relationship and outlook of herdsmen living in the Northeast Province.

to acquainting herdsmen with the grazing and range management schemes. All of the chiefs and sub-chiefs as well as a number of individual livestock owners in the pilot area received a week's training at the Giriftu Pastoral Training Center. Similar training is being given to people in those areas now proposed for development. Further, each block will be assigned a trained range manager responsible for carrying out the block management plan. The Block Manager will work closely with the livestock owners to promote their understanding and acceptance of the plan. Finally, as each block's water facilities are completed, the Range Management Division will have these blocks declared control areas under the Kenyan Agricultural Code.

2. Ranch Development (AFC)

a. Ranching Enterprises

With joint external financing from IDA (\$18.5 million) and A.I.D. (\$4.1 million), ^{the Project will provide} for the development of three types of ranches through the Agricultural Finance Corporation (AFC).

1. Group ranches are enterprises in which 50 to 100 families collectively hold title to land, maintain agreed stocking levels, market surplus in rotation, and yet continue to own their livestock as individuals. Debt liability and loan servicing is a group function; repayment is affected by a "per head of cattle" charge to individual cattle owners for services rendered by the group. Profit sharing to members is based on the sale of their own animals minus collections for loan servicing. The Project would finance about 60 group ranches located mainly in Kajiado, Narok and Samburu districts. They would be established on trust land which in the past was communally grazed, but which is currently being adjudicated and ownership vested in groups or individuals. The average size would be about 16,000 ha (39,520 acres) but a considerable range in size is expected depending on ecological and other local conditions. On the ranches the carrying capacity of the rangeland would be increased from about 2,500 animal units to about 3,500 animal units at full development. Breeding and fattening operations would be carried out. The main investment items on these and the company and cooperative ranches discussed below would include water development, firebreaks, farm roads, stock dipping and handling facilities, workmen's housing, farm equipment, breeding stock, steers and incremental working capital. To avoid potential Code 935 procurement problems the use of A.I.D. funds would be limited to the local cost purchase of cattle. Average investment per ranch would be about Ksh 1.0 million (\$140,000).

Since group ranching by definition involves an effort to stabilize traditionally nomadic pastoralists, it will undoubtedly be the most difficult portion of the ranching project to implement. AFC is very much aware of this fact and is counting heavily on experience gained under Phase I with group ranching as well as the establishment of a special unit for handling group ranch loans to meet its target of extending credit to 60 group ranches under this project. While no difficulty is anticipated in establishing the desired number of ranches (51 new group ranches have already been formed and registered), AFC expects to spend considerable staff

* Group members have been identified, land has been adjudicated and the group has been organized into a corporate body with power to accept loans and conduct business enterprises.

time working with the group ranch leaders, acquainting them with credit concepts where necessary, setting up books and maintaining records, preparing credit applications, etc. Additional technical assistance will be forthcoming from the Range Management and Water Departments. Planning and design of water development will be provided free of charge by the Range Water Division.

2. Company ranches are enterprises in which land is leased from the Government or County Councils and prospective shareholders put up cattle or a cash equivalent for shares. Animals are collectively owned and profits shared according to established agreement. Cooperative ranches are similar in nature except that they may utilize trust lands. The Project would finance the development of 21 company/cooperative ranches on rangeland in Taita, Tana, Kwali and Kilifi districts. The average ranch size would be about 28,000 ha (69,160 acres) at full development. Average investment per ranch would be about Ksh 1.7 million (\$240,000). It is expected that each company ranch will have at least 50 shareholders.

3. Commercial ranches are owned by several individuals or a company (typically made up of 200 to 500 small farmer shareholders) on freehold land or leasehold. The Project would finance the development of about 100 commercial ranches located in Nakuru, Laikipia, Nyandarua and Machakos districts. Although a considerable range in size is expected, the average ranch would be about 3,500 ha (8,645 acres). Although development of these ranches is already relatively advanced, project funds would provide for further development; the main items financed would include water and stock handling facilities, breeding stock, steers and incremental working capital. The average investment per ranch would be about Ksh 0.9 million (\$125,000).

Project description to be incorporated as part of the A.I.D. and IDA credit agreements will specifically call for the development of the number of ranches described above, i.e., 60 group ranches, 21 company and cooperative ranches and 100 commercial ranches. It is expected that cooperation between and close monitoring by A.I.D. and IDA will assure that AFC funds are not being disbursed for the relatively easier to develop commercial ranches to the detriment of group and company ranches.

b. Agricultural Finance Corporation (AFC)

Established in 1963 and operating as a government owned corporation responsible to the Office of the President, AFC provides medium and long-term secured credit for agricultural development. Its financing is provided mainly by the Government in the form of irredeemable and redeemable capital, the latter being onlent to AFC by the Government. Funds provided under this Project, including the GOK's contribution, would be onlent to AFC for 20 years including a 5-year grace period at an interest rate of three percent per annum. These funds would be subloaned through AFC's Ranch Section at AFC's current lending rate of 8 percent per annum for a period not to exceed 10 years including a three-year grace period. The Project schedule calls for commitment of all AFC funds in three years, with disbursements taking place over five years.

Over the past several years, A.I.D. has provided considerable technical assistance to AFC including financing of its General Manager and Ranch Section Head from 1968 to 1973 and the current provision of a senior credit specialist attached to the Ranch Section. Additional managerial, accounting and technical staff will be provided under this Project with IDA financing.

For a full discussion of AFC's operations, including financial statements, see Annex X.

3. Meat Processing Study

To assist the GOK in determining a strategy for the meat processing industry in Kenya and to review the number, location and size of processing plants, projected benefits in livestock movement, disease control and producer prices, the Project, with A.I.D. financing, will provide for the carrying out of a comprehensive meat processing study. The terms of reference for the study as well as selection of the consultant will be coordinated closely with IDA and the GOK. It is expected that arrangements will be made for the study within one year of execution of a loan agreement.

IV. ENGINEERING ANALYSIS

A. Northeast Project

For development of approximately 14 million acres of grazing land in the Northeast Province the project includes financing for the following elements during the four-year construction period: (1) purchase of earthmoving equipment and related support vehicles for the force account construction of water reservoirs and access roads (tracks), (2) contract drilling and development of boreholes, (3) equipment operation and maintenance costs, including POL and other recurrent costs, (4) purchase of maintenance equipment and spare parts, (5) operation and equipping of range management personnel, (6) provision of staff housing for range officers, and (7) technical assistance personnel for equipment management and maintenance. The proposed A.I.D. loan will finance the foreign exchange costs associated with equipment purchase and technical assistance, and the local costs of POL and a portion of the borehole development expense, all other items will be financed by the GOK.

During Phase I of the Northeast Province range development program, grazing blocks 1 thru 3 (approximately 1,408,000 acres) were developed with IDA financing as a pilot project in accordance with the plans and design set forth in the A.I.D.-financed "Development Plans and Feasibility Study on Pilot Range Development Project, Northeast Province, Kenya" (Mass Study). Although additional blocks (4 through 8) were also scheduled for development during Phase I, funding shortages limited development beyond the pilot area to roughly 50 percent of block 4. Thus Phase II, which originally was scheduled to start with block 9, has been expanded to include those blocks not completed under Phase I, i.e., the balance of 4 plus 5 through 8. Blocks and acreages to be developed during Phase II (the proposed project) are as follows:

<u>Block No.</u> ^{1/}	<u>Name</u>	<u>Net Area Size (Acres)</u> ^{2/}
4	Buna	576,000 ^{3/}
5	Tarbaj	1,792,000
6	Lak Dera	1,984,000
7	Lak Dima	2,048,000
8	Dadaag	1,280,000
9	Giriftu	1,600,000
10	Waju	2,176,000
11	Dif	1,472,000
15	Takaba	<u>1,408,000</u>
		14,336,000

^{1/} Blocks 12, 13 and 14 have been deferred for later development pursuant to GOK priorities.

^{2/} Block acreage counts do not necessarily agree with those in Mass Report due to boundary redefinition following further study and reconnaissance.

^{3/} Equivalent to approximately 50 percent of total acreage, half of the block having been developed under Phase I.

Development of these blocks will follow the design outlined in the Mass Study and will consist of establishing minimal infrastructure facilities - primarily permanent and temporary watering points and boundary/access roads. (See Section III A for a discussion of the relationship of water to range management.)

1. Planning and Implementation

The A.I.D. grant-financed PASA team, consisting of a Range Management Advisor, an Agriculture Engineer and a Hydrogeologist, are assigned to the Project, working with the Water Department and Range Management Division in the Ministry of Agriculture. This team represents a continuation of the technical assistance provided by A.I.D. under the pilot project.

Working on site with their GOK counterparts and the local Range and Water Survey Team and Provincial staff, the PASA team will undertake all planning, design and implementation of the Range Water and Range Management development required during the four-year construction period. This includes responsibility for the preliminary engineering of the block development plan, final design of block facilities, and implementation of engineering requirements, i.e., inspection and construction layout during the construction phase, using personnel from the engineering section of the Water Department for field support.

Prior to actual construction, a management plan is prepared by Range Management in conjunction with the Water Department for each grazing block. This plan includes a physical description of the block (location, size, topography, soil, climate, vegetation), a review of the history, sociology and ecology of the block, an estimate of current and potential carrying capacity, a projection of development costs and benefits, the grazing system formula and management controls to be applied (including designation of wet and dry season pastures), correlation with other uses of the block (wildlife, LMD routes and holding-grounds, camel herding, etc.), an overall implementation schedule, a plan for maintenance and procedures for executing plan revisions.

2. Construction

The order of work from year 1 to year 4 of the project would follow a development plan for the timely implementation of required infrastructure facilities in each block: (a) road construction to delineate grazing block boundary lines, (b) preliminary site investigations for construction of water reservoirs and borehole development, (c) construction of access roads to selected water sites, (d) construction of reservoirs and/or (e) exploratory drilling for borehole development and/or contract drilling for development of production wells, (f) installation of ancillary items, pump, tanks, troughs, gabions, fencing, (g) construction of housing for range officers.

a. Reservoir Design and Construction

Detailed reservoir design will be based on a modification or fitting to site conditions of the standard plan for the reservoir of the designated size required in the development plan. Reservoirs will be of three basic sizes: (1) large - 5.0 million gallons or less, (2) medium - 3.0 million gallons or less, and (3) small - 0.5 million gallons or less. Each reservoir will be sited on the basis of watershed area, rainfall potential and sub-surface ground conditions.^{1/} The location and size of each reservoir will be selected by the Range Management Division and will conform to the wet/dry season grazing system.

The proposed construction of 45 large, 24 medium and 160 small reservoirs is to be done by force account operation by the Range Water Branch of the Water Department, Ministry of Agriculture, using a designated spread of equipment known as a Dixey Unit.^{2/} Presently the Water Department has one Dixey Unit working the Northeast area. The construction schedule for the pans is based on operating this Dixey Unit in grazing blocks 4, 5, 9, 10 and 15 during years 1 to 4 of the project. A new Dixey Unit will be provided under the proposed loan and will be available on site during year 2 of the project. This new Dixey Unit will start work in Block 6 and after completing work in this Block will move to Blocks 7 and 11, through years 2 to 4 of the project. (Annex VII).

Projected pan construction work is based on past performance under Phase I, where the Dixey Unit had the capability under optimum conditions of constructing 12 large pans or 20 medium or 60 small pans per year. Allowing for delays due to logistical problems and net available equipment operation time, it is expected that construction can be completed with two Dixey Units during the four-year project period.

^{1/} Large reservoirs, for example, will only be constructed where the watershed area is such that a system of crude drainage channels can be constructed to collect the runoff necessary to fill the reservoir. Temporary (small) reservoirs will be placed so as to optimize the chances for catching water from the "strip" rains common in the Northeast.

^{2/} The Dixey Unit, named for the originator under Phase I Livestock Project, consists of 6 - 10 units of equipment capable of a self-contained construction capability of the type and size facility designated for the Project. A Dixey Unit would normally consist of: 3 motorized scrapers, 2 graders, 1 track dozer, 2 rubber-tired pushers, 3 - 5 flatbed trucks, 3 pickup trucks and maintenance support equipment. The Unit is designed for high mobility.

b. Borehole Drilling and Development

The Water Department will contract for borehole drilling, testing and development using competitive bid procedures. All planned borehole development during the four-year period of the project will be completed in this manner. In addition, the Water Department will provide, by force account operations, two borehole equipping teams to build pump houses and watering troughs. Contract methods will be used to install storage tanks. Thirty-seven boreholes are planned for drilling and equipping during the four-year period. In addition, 11 existing boreholes will be equipped.

For borehole development, the ground water hydrogeologist, using hydrogeologic studies and location requirements of the Range Management Division, will site locations for borehole exploratory drilling and borehole development for producing wells. Borehole logs will be maintained by the contract driller, under monitoring by the ground water hydrologist, and all data will become the property of the Water Department and be maintained in permanent files.

Ancillary design requirements for both reservoirs and boreholes related to Gabion Construction, perimeter fences, pump requirements, storage requirements and water troughs will be completed on site by the Water Department.

c. Boundary and Access Roads (Tracks)

Each grazing block developed will require a minimum amount of track construction comprising a low standard dry weather type road with no permanent drainage structures or all-weather surfacing materials. These roads require a minimal equipment time input and engineering layout. The roads would be 12 - 14 feet in width (width of a dozer blade) and would follow the grazing block boundaries and section divisions. These low standard roads would provide block and section delineation, fire break control and access to watering points.

At present one track construction unit is available (see Table 4, Annex VII) with the capability of construction and maintenance of about 300 miles of track per year. Approximately 2,600 miles of new track will be constructed in blocks 4 - 11 and 15 under the Phase II Project. To meet these planned objectives one additional track unit will be purchased under the loan. The loan will also provide for replacement of three to five pieces of equipment now assigned to the existing track construction unit.

Track construction will be by Water Department force account operations. Supervision (scheduling) of the unit will be the responsibility of the Range Management Division.

d. Pumps, Storage Tanks and Watering Troughs for Large Reservoirs

Following the construction of the large pans it is planned to concurrently install at ten of the sites small pumps, 5,000 gallon storage tanks and watering troughs. This work will be done by force account operations and coordinated between the Water Department and Range Management.

e. Staff Housing

Fourteen grade 6, fifteen grade 8, and fourteen grade 9 staff houses will be constructed at the grazing block sites for range management and other personnel. This housing, to be built to standard GOK plans and specifications, will include one-room houses constructed near the middle of each grazing block to provide overnight quarters for Block Managers and other government personnel while working in the block, and houses of three to five rooms to serve as permanent quarters for Block Managers.

3. Operation and Maintenance

a. Equipment

(1) Equipment Operation

On site equipment operation and camp support requirements will be provided by GOK personnel. These personnel will be under the jurisdiction of a camp Officer In Charge (OIC) responsible for the overall camp establishment, administrative requirements and logistical support for day-to-day living. The availability of equipment operators, mechanics and camp support personnel is not expected to present a problem for operation of the additional Dixey Unit and Track Unit being procured.

(2) Equipment Maintenance

REDSO/USAID analysis, supported by assistance from a short-term equipment specialist consultant, concluded that the following maintenance inputs are necessary to assure operation and maintenance of the construction units in such a way as to meet the project's four-year construction schedule:

(a) Maintenance Equipment and Facilities

The Project will provide for the procurement of the basic required shop tools and maintenance equipment necessary to maintain both the existing ^{and proposed} Dixey and track unit equipment. The levels of maintenance support are planned so that the field construction site has the capabilities of doing first, second and third echelon maintenance.

In addition, during year one of the project a maintenance shop and warehouse will be constructed at Wajir to provide for a permanent installation for: 1) first, second and third echelon levels of repair for vehicles and equipment; 2) repair of the Ministry of Agriculture vehicles and equipment moving throughout the Northeastern area; 3) limited stocking of fast-moving parts; 4) a back-up facility to support the construction site operations; 5) temporary storage of POL, equipment and other required project items.

The warehouse will be of a simple design using locally available construction material and will be of the least size necessary to meet the above requirements. Design and construction of the shop and warehouse will be the responsibility of the Water Department.

Operation of the shop at Wajir will not require more than five GOK personnel. These personnel would be under supervision of the equipment specialist assigned as part of the technical assistance input to the project (see below). The equipment specialist would have the responsibility of supervising and performing repair on equipment and vehicles operating in the Northeast area on the livestock project including Water Department, Range Management and Livestock Marketing Division vehicles

Additionally the equipment specialist would assist in the flow and acquisition of spare parts as required at the Dixey Unit and Track Unit construction sites. A small stocking of spare parts would be held at this shop and the shop would function as a drop point for required spares coming in from the Nairobi area.

b. Spare parts

The Project will finance the costs of spare parts over the four-year Project period for both the existing equipment of U.S. source and origin and the proposed equipment. Three methods are proposed for spare parts procurement:

1. At the time of procurement of new equipment, the manufacturer will provide a listing of fast-moving items. A small percentage (5%) of equipment acquisition costs will be utilized to procure these items.
2. A spare parts procurement contract will be executed between the GOK and in-country local equipment dealers to supply spare parts on an "as needed" basis for U.S. source and origin equipment operating on site.
3. Spare parts will be procured through a U.S. wholesale parts supplier for "as needed" parts that are not available under methods (1) and (2) during years 2, 3, and 4 of the Project. It is not contemplated that spare parts will be procured by large lot orders on a competitive bid basis for warehouse stocking.

c. Technical Assistance

It was determined from on-site inspections and discussions with the GOK that the Project requires technical assistance to assure adequate equipment maintenance and utilization; to establish and operate the proposed District Maintenance Shop at Wajir; and to establish and implement an adequate spare parts logistical system between the Nairobi source and the site of operations in the Northeast. It is therefore proposed that:

(1) Two equipment technicians (Master Mechanics) on a GOK direct-hire basis for assignment to each Dixey Unit be recruited for the Project. The first man would arrive during year one of the Project to work with the existing Dixey Unit and the second man would arrive during year two to work with the new Dixey Unit.

(2) A Master Mechanic/Shop Technician on a GOK direct-hire basis would be recruited during year two to operate and manage the Wajir District shop. The technician's arrival would coincide with the arrival of the shop tools being procured under the loan.

(3) A spare parts/warehouse technician on a GOK direct-hire basis would be brought on to the Project during year one to expedite and implement purchasing of spare parts and POL and supplying the warehouse and construction sites in the Northeast area.

d. Infrastructure - Operation and Maintenance

The Water Department is responsible for the actual maintenance of reservoirs, boreholes and range tracks as these infrastructure units are developed for the Project. The Range Management Division is responsible for selecting which structures need maintenance. GOK plans call for eventual implementation of user charge to pay for operation and maintenance of water facilities.

(1) Boreholes. Borehole operation (daily pumping and cattle watering) will be done by locally trained operators under the supervision of Water Department personnel. The Range Management Division, however, is responsible for determining when and which boreholes to operate.

(2) Pans. An estimated seventy-seven (77) large, medium and small pans will need varying degrees of maintenance by the end of 1977. Some of this work will be done in conjunction with equipping the large pans with pumps, storage tanks and watering troughs. Most of the maintenance, however, will consist of removing silt from the sediment and main pools and construction of post and wire fences and thorn bush fences where needed for pan protection.

(3) Tracks. Approximately 5,000 miles of track maintenance is needed over the next four years for planning, implementing and maintaining the Project. Most of this work will be done by the Dixey Units while they are working a grazing block during the construction phase. The balance will be done by the Track Construction Unit.

4. Basis for Cost Estimates - Northeast

Cost estimates for the construction portion of the Northeast program were developed on an item-by-item basis using existing Ministry of Agriculture (Water Department and Range Management) records of the Phase I Project and the IBRD appraisal report for this Phase II Project. In addition, USAID/FEDSO reviewed and upgraded pricing and cost estimates as follows: all equipment procurement includes a ten percent (10%) escalation factor to date of purchase; costs of petroleum, oils and lubricants (POL) as a portion of the equipment operational costs were increased by one hundred percent (100%) in the first year and nothing thereafter; other costs were assumed to increase 8 percent per year for an average of 16 percent over the four year construction period.

The services of a short-term consultant were retained to establish and cost out the requirements for the new equipment maintenance support units, shcp tools and technical assistance necessary to meet the objectives of the project.

See Annex VII for details on costs and cost assumptions.

The following table provides a summary of capital and technical assistance costs for the Northeast portion of the Project:

	<u>Cost (\$000's)</u>
A. <u>Water Department</u>	
Reservoir construction and equipping*	2,315.5
Track construction*	208.0
Borehole construction and equipping	1,227.6
Construction equipment and vehicles	929.5
Maintenance shop and equipment	<u>194.8</u>
	4,875.4
B. <u>Range Management</u>	
Housing	376.3
Vehicles	137.5
Miscellaneous equipment	<u>43.6</u>
	557.4
C. <u>Technical Assistance</u>	
Equipment Specialists	330.0
Procurement services	<u>75.0</u>
	405.0
TOTAL	5,837.8
+10% for contingency	<u>583.8</u>
	6,421.6

* Excludes cost of construction equipment

B. AFC - Ranch Development

Phase II of Livestock Development is scheduled to include 60 group ranches, 100 commercial ranches and 21 company or cooperative ranches. (See Annex V, page 5 for a discussion on the Phase I ranching program financed by IDA.)

Group ranching areas proposed for development are primarily in Narok, Kajiado and Samburu Districts of Rift Valley Province. To date little development has been done on these ranches. The lands are being adjudicated to nomadic pastoralists who have traditionally grazed these lands. Company and commercial ranches scheduled for development are in more productive areas in the southern and coastal parts of Kenya.

1. Planning

Planning teams from the Range Management and Water Department will consist of a PASA Agricultural Engineer and Range Planner and their Kenya counterparts. The PASA Hydrogeologist will assist in water development planning as needed. The Range Planner along with his Kenya counterparts will conduct mapping of range type, soil type, range condition, and trend. From this data and actual production measurements, when forage is available, a carrying capacity for each ranch unit will be obtained. The Range Planner will also determine water development and associated structure needs and prepare a management plan to assure proper use of the forage resource into perpetuity.

The Engineer will determine feasibility of water development and related structures as proposed by the Range Planner. He then prepares preliminary plans and cost estimates. His work also entails feasibility of other structural improvement, roads, etc. necessary for ranch development.

2. Water Development Procedures

The water development survey for group ranches is the responsibility of the Water Department under the Ministry of Agriculture working in cooperation with the AFC and RMD. A survey team, including A.I.D. PASA members and operating out of Water Department headquarters, is responsible for actual site inspection and area reconnaissance from which a determination would be made as to the most economical and feasible method of water development. A water survey report would be prepared showing the above which would then be passed to AFC for determination of viability of the necessary subloan.

For commercial and company ranch development it is expected that engineering consulting firms will be engaged to conduct the water survey, the cost thereof to be eligible for AFC financing.

3. Subloans

Subloan application for ranch development is made to AFC after plan completion. The subloan will cover cost of construction of needed water improvements (boreholes and reservoirs), purchase of steers, bulls for upgrading the herds, motorized equipment and working capital. Use of A.I.D. funds will be limited to the purchase of cattle.

4. Construction

Construction of improvements is to be performed by private firms on a bid basis. To encourage bidding and to realize a more competitive price a group of ranches in one locale will be included in each bid package.

5. Range Management

To insure proper range management, ranches will be required to have a properly qualified ranch manager, such as graduates of Egerton College, AHITI or Sinya Training Center. To prevent overstocking a carrying capacity will be established in cooperation with the Range Management Division. Range condition and trend studies established by the planning teams will be used as the final control of carrying capacity.

6. Basis for Cost Estimates (AFC)

On the basis of investment models for typical group, company and commercial ranches; IBRD has estimated that approximately \$32.1 million will be required for the 180 ranches and 3 feedlots scheduled for development under this Project. Of this amount, approximately \$13.3 million is estimated for the purchase of cattle (exclusive of feedlots which A.I.D. will not be financing). The investment models prepared by IBRD are included in Annex X.

C. Contractor Availability

1. Northeast Province Area

In this area, contract work will apply only to (a) borehole drilling and development; (b) some staff housing and warehouse construction; (c) some pump installation and storage tank assemblies.

The past experience of the Water Department shows that contractors are available in the immediate or adjacent areas to bid on this type of work. Water Department has in the past and is presently using contractors in the Northeast area for such work with satisfactory results.

The magnitude of the work is such that Kenya contractors will be attracted to bid on the work, especially borehole development. All work can be undertaken by Kenyan contractors.

2. AFC Ranch Area

Both the AFC and the Water Department in the past have had satisfactory experience in this area of Kenya in obtaining sufficient, satisfactory and reasonable bids for borehole development. The magnitude of the proposed Phase II program will provide additional incentive for contract response to work in this area.

With regard to ranch reservoir construction, contractor response has been minimal, but satisfactory. It is planned during implementation of the ranch development to group a number of reservoir construction projects within one Invitation for Bid. This would assure lower mobilization costs and an expected greater response from local contractors. All work can be undertaken by Kenyan contractors.

V. FINANCIAL ANALYSIS

A. Cost Estimate

Detailed cost estimates for the proposed AID project components are contained in Annex VII, Tables 1 through 8 and are summarized below (\$000's).

	<u>Foreign Exchange</u>	<u>Local Cost</u>	<u>TOTAL</u>
Northeast Project			
Water Development	1,931.0	3,337.1	5,268.1
Range Management	238.0	984.2	1,222.2
Maintenance Equipment and Personnel	514.8	-	514.8
Subtotal	(2683.8)	(4,381.3)	(7,005.1)
Physical Contingency (10%)	<u>268.4</u>	<u>432.1</u>	<u>700.5</u>
	2,952.2	4,753.4	7,705.6
AFC (Ranch Credit) ^{1/}	-	5,685.7	5,685.7
Meat Processing Study	<u>200.0</u>	-	<u>200.0</u>
	3,152.2	10,439.1	13,591.3

^{1/} Includes 30 percent host country contribution, i.e. 10 percent from the GOK and 20 percent from private beneficiaries. Does not include the IDA loan, nor the associated proportionate contributions to the IDA loan from GOK and beneficiaries.

B. Financial Plan

The financial plan for the proposed project is as follows
(\$000's):

	<u>Foreign Exchange</u>	<u>Local Cost</u>	<u>TOTAL</u>
Northeast Project ^{1/}			
AID Loan	2,952.2 (56%)	2,307.3 (44%)	5,259.5 (68%)
GOK	-	2,446.1	2,446.1 (32%)
	<u>2,952.2</u>	<u>4,753.4</u>	<u>7,705.6 (100%)</u>
AFC			
AID Loan	-	4,100.0	4,100.0 (70%)
GOK ^{2/}	-	528.6	528.6 (10%)
Beneficiary Contribution	-	<u>1,057.1</u>	<u>1,057.1 (20%)</u>
		5,685.7	5,685.7 (100%)
Meat Processing Study			
AID Loan	200.0	-	200.0 (100%)
TOTAL			
AID Loan	3,152.2 (34%)	6,407.3 (66%)	9,559.5 (69%)*
GOK & Beneficiaries	-	<u>4,031.8</u>	<u>4,031.8 (31%)</u>
	3,152.2 (24%)	10,439.1 (76%)	13,591.3 (100%)

* Round to \$9.6 million

^{1/} Includes 10% price escalation to date of purchase on equipment; other items include 8% p.a. for inflation or an average of 16% over the 4-year construction period, except POL for which cost was increased 100% in year one and nothing thereafter. See Annex VII for details.

^{2/} Does not include as GOK contribution Water Department's design work for group and company ranches, equivalent to approximately \$0.5 million.

1. Northeast Project

It is proposed that AID finance the total foreign exchange ^{1/} requirements of the Northeast project and approximately 48 percent of the local costs (equivalent to 44 percent of the proposed loan). Foreign exchange costs to be financed under the AID loan include the heavy earthmoving equipment, vehicles, spare parts, maintenance equipment and the four maintenance/logistics specialists. The AID contribution for local costs would be used primarily for POL and invoiced costs associated with borehole drilling and equipping, all on a cost reimbursement basis. Reimbursement of local costs by AID will be made upon presentation of required documentation and satisfactory evidence that the GOK is making budgetary allocations to the Range and Water Departments when and as required and that these Departments are carrying out their contribution to the project in an acceptable manner. (See Annex VII for a detailed breakdown of the Northeast costs and proposed AID/GOK sharing of these costs).

2. AFC

AID's contribution to the proposed AFC ranch development program will be commingled with the IDA and GOK loans to avoid placing upon AFC unnecessary accounting and administrative burdens that would ensue if each donor were to require the setting up of special accounts and identification of special subloans for the use of its funds. To ensure, however, that AID funds are utilized to finance legitimate local costs, AID disbursements will be made exclusively for the purchase of cattle for the ranching operations. While cattle purchases will represent more than 50 percent of the total AFC disbursement, AID's loan input will represent only 15 percent of the total AFC financing. It has been agreed with IDA and the AFC that limiting the use of AID funds to cattle purchases can be readily accomplished by charging a percentage of each AFC reimbursement request to AID. That at least this amount was spent on cattle will be verifiable by AFC's copies of invoices for cattle purchases.

The total cost of the AFC ranching program is estimated at \$32.1 million, including in addition to the AID contribution, the IDA loan of \$18.5 million and a loan from the GOK of \$3.2 million at the same terms as for the IDA and AID loans. Another 20 percent or \$6.3 million will be in the form of equity contributions by the ranch subborrowers. Costs to be financed for the ranching and feedlot schemes other than cattle, include water development, firebreaks, farm roads, stock dipping and handling facilities, workmen's housing and working capital. (See Annex X Tables 8 thru 19 for estimated costs for model ranches and facilities.)

C. Loan Terms

It is proposed that proceeds of the AID loan be made available to the GOK at AID's standard concessional terms: ten-year grace period at

^{1/} Defined on basis of source of procurement

2 percent interest per annum followed by a 30-year repayment period at 3 percent interest per annum. The GOK would onlend \$4.1 million of the total loan to the AFC at 3 percent interest for 20 years, inclusive of a five-year grace period. AFC subloan terms would be 8 percent per annum with a maturity not to exceed 10 years, inclusive of a grace period not to exceed three years.

D. Prospects for Repayment

Kenya has an excellent record for meeting external obligations promptly. The Kenyan economy is stable with an average 7 percent growth rate since independence and should continue to generate adequate resources to service this loan. The debt service ratio in 1972 was 3.6 percent.

Introduction

A complete economic analysis of the project was conducted by IBRD/IDA staff in preparing the IBRD "Appraisal of Second Livestock Development Project - Kenya." Utilizing shadow prices for labor and foreign exchange, excluding price contingencies, valuing production at international prices adjusted for transport costs and, using as an approximation of the value of wildlife development the benefits which would have accrued to group ranches if they had been developed instead of game parks, the economic rate of return for the total project was estimated to be 27 percent. If capital costs were increased by 10 percent and benefits decreased by 10 percent the rate of return declined to 19 percent. While the above analysis is no longer strictly valid due to changes in the project -- an expansion of Northeast Province Development and the exclusion of construction costs for an abattoir -- it appears the effect of the changes would be to improve the rates of return because with the changes, production is increased, foreign exchange costs are decreased and exports are largely unaffected vis-a-vis the original project.

Nevertheless, due to the difficulties encountered when attempting to modify the original IBRD/IDA analysis to reflect the changes, an economic analysis of only the revised Northeast Range Development Project was prepared. For the ranches and feedlots to be financed through the AFC, model ranch plans including projected cash flow are presented as originally prepared by IBRD. Financial returns expected for each type of ranch (as calculated by IBRD) are 23 percent for group, 15 percent for company and 12 percent for commercial.

Benefits

The primary economic benefits from the Northeast range development project result from increased cattle population and offtake as the carrying capacity of the range is increased almost two and a half times at full development in four years and the offtake rate is raised due to better management and several other factors. Secondary economic benefits also accrue from (a) growth in sheep and goat population due to increased water availability and better range management, (b) reduction in camel population at least in part due to the redundancy of water-carrying pack animals, and (c) increased incremental milk production for subsistence consumption from cows which do not have to walk as far for water and forage.

Under what have been determined to be the most probable parameters^{1/} the cattle population increases from the current level of 212,980 head to 352,882 head in year 20 -- an increment of 139,902 head or a 165% increase. Offtake grows from 11.5 percent currently (including 3 percent for subsistence consumption) to 16.3 percent (again including 3 percent for subsistence) or from 24,460 head to 57,650 head. At an average price of

^{1/} See Table 2, Annex XII

Ksh 500/head (Ksh 2.65 per kilogram) the value of the incremental offtake is shown in Table 2, Annex XII.

Benefit Distribution

Northeast range development would directly benefit the owners of over 352,000 cattle by year 20. No definitive studies of cattle ownership in the Northeast are available but if it is assumed that per capita ownership is about 5 head (one study indicates per capita ownership of approximately 2 head which the Project Committee considers low), the Project would benefit over 42,000 individuals initially and 63,000 individuals in year 20. Per capita incomes would be increased from an estimated \$45 per annum to about \$64 per annum in twenty years. This computation only recognizes benefits from cattle offtake; in reality, additional "income" will be derived from better milk supplies and larger sheep/goat offtake. See Table 4, Annex XII.

For the AFC ranching component, the IBRD has calculated that with all ranch investment in place by year 5 of the project, approximately 10,000 families or 51,000 individuals would be benefitted. Per capita cash incomes would be increased from \$56 per annum to an estimated \$195.

Internal Rate of Return

Utilizing the most probable coefficients for herd growth and offtake, attributing all incremental cattle benefits to the project, and utilizing market prices for both costs and benefits, the IRR is calculated to be 10.66 percent (Table 3, Annex XII). To the extent that in-migration of cattle from outside the project area occurs^{1/} and the highly conservative herd growth coefficients are exceeded, this IRR will rise.

Sensitivity analysis indicates that with a ten percent reduction in benefits and ten percent increase in investment costs, the internal rate of return falls to 8 percent. The Project Committee, however, believes that the conservative herd growth and offtake parameters may be exceeded, and with only a ten percent increase in benefits, the internal rate of return rises two points to 12.6 percent. See Tables 3a and 3b for calculations.

^{1/} Which is not an unreasonable expectation since even in Year 20 the developed range will not yet be fully utilized.

VII. MANAGEMENT, IMPLEMENTATION AND EVALUATION

A. Project Management

Project Coordination Unit (PCU)

Responsibility for overall project coordination of the Second Livestock Development Project is vested in the Project Coordination Unit as provided for under the Development Credit negotiated between the Republic of Kenya and International Development Association:

The Project Coordination Unit, within the Borrower's Ministry of Agriculture and under the direction of a full-time Project Coordinator, will be responsible for the overall coordination and supervision of the Project, in cooperation with the Borrower's Ministries and other agencies involved in the Project. The Project Coordinator, appointed by the Minister of Agriculture and responsible to the Director of Agriculture, is empowered to make all day-to-day decisions relating to the operation of the Unit, including staff management. He is assisted by an Assistant Project Coordinator and such supporting staff as may be required for the efficient carrying out of the responsibilities of the Project Coordination Unit. These responsibilities include the following:

1. coordination and integration of all Project activities with the ministries and other agencies of the Borrower;
2. arrangements for and advice on the selection of consultants and other specialists required for the Project;
3. arrangements for and decision on the selection of people for training under the Project;
4. evaluation of investment plans, as to technical, economic, ecological and aesthetic suitability, before submission to AFC for final approval; and
5. project monitoring reporting and evaluation, including monitoring and evaluation of the First Livestock Project, and evaluation made by consultants, universities or other agencies employed by the Project Coordination Unit.

The PCU was officially established in late 1973 with the selection by the GOK and approval by the IBRD and A.I.D. of the Project Coordinator (formerly head of Range Management) and his deputy (an A.I.D.-financed advisor to the Ministry of Agriculture).

Implementing Agencies

The principal institutions through which project implementation will proceed are:

- a. The Agricultural Finance Corporation (AFC);
- b. Range Management Division of the Ministry of Agriculture (RMD); and

c. The Water Department of the Ministry of Agriculture (WD).

The Range Management Division (RMD) is staffed with about 360 professional and technical employees and receives substantial assistance from A.I.D.-financed range advisors and FAO/UNDP specialists. In addition to field and extension activities, RMD is also charged with responsibility for initiating research on rangelands. The Water Department's Range Water Division, which also receives considerable technical assistance from A.I.D., is responsible for water supplies on range areas. The Agricultural Finance Corporation is the government's principal institution for extending agricultural credit.

In each of these organizations USAID is providing technicians, through PASA agreements or contract, who will be directly involved in implementation activities. These technicians include:

- (1) Credit specialist, AFC Ranch Section and 3 area credit supervisors for AFC
- (2) Three Range/Ranch Planners for RMD
- (3) Three agriculture engineers for WD
- (4) One hydrogeologist for WD

In addition, USAID is supplying the Deputy Project Coordinator and one Livestock Economist for the Economic Planning Division of the Ministry of Agriculture.

USAID has provided degree training in range management for 9 Kenyans and short-term training for 11 others. In 1973, 5 participants started training in U.S. universities, 3 in range management and 2 in agriculture engineering. It is anticipated that over the next 4 years a total of 26 participants will have received or be in the process of acquiring degrees in the above fields and thus be available to continue activities started under the Phase II Developments.

In addition to the above mentioned A.I.D.-financed technicians and U.S.-trained Kenya staff, four equipment specialists are to be financed under the proposed loan: These include:

1. A coordinator for logistics and accounts in the Water Department for the N. E. Province Development.
2. A maintenance foreman and coordinator for N. E. province development.
3. Two maintenance foreman/master mechanic, one for each of the two units.

With the above mentioned support along with other donor contributions to the Kenya Government's institutions and governmental departments, project management infrastructure should be adequate.

B. Project Schedule

It is anticipated that the entire loan should be drawn down within approximately four years of loan execution, i.e., the time-frame of the overall project. Virtually all equipment will be procured within the first 12-18 months. Most drilling on both the Northeast and on AFC-supported ranches, all to be performed by private contractors, will be completed by the end of Year Three. Pan and access road construction will extend over the entire four-year period. Chronological progress of AID loan-financed project elements is projected as follows:

May 15, 1974	Loan authorized and draft loan agreement presented to GOK.
June 30, 1974	Loan Agreement signed.
June 30, 1974	Specifications for heavy construction and maintenance equipment, well pump, and vehicles prepared by GOK; draft procurement agency contract prepared; recruitment begins for 4 loan-financed technicians.
July 30, 1974	REDSO approves above specs and draft procurement contract; both sent to procurement agency.
August 15, 1974	Initial Conditions Precedent cleared; procurement agency contract signed.
August 30, 1974	Procurement agency arranges publication synopsis in CBD and SBC as appropriate.
August 30, 1974	Dixey Unit No. 2 begins construction first pans in northeast; REDSO approves well drilling IFB.
September 15, 1974	Heavy equipment/maintenance vehicles pumps IFB released.
September 30, 1974	WD releases IFB for well drilling contract for Northeast (5-10-wells) and Wajir workshop; RMD releases IFB for staff housing in Northeast (first year's requirement - 11 houses).
October 1, 1974	WD lets design contract for water facilities on first 10 AFC ranches.
November 15, 1974	U.S. equipment, workshop, and housing IFB's opened.
November 30, 1974	N.E. well drilling contract award recommended by GOK.
December 15, 1974	AID/W approves all minor U.S. equipment procurement awards; GOK awards workshop and housing construction contracts; REDSO approves well drilling contract.

December 31, 1974 REDSO/GOK approves major U.S. equipment awards and request AID/W issue L/Comm; procurement agent establishes L/Credit.

December 31, 1974 AFC ranch water designs completed (first 10).

January 1, 1975 Japanese-financed heavy equipment (temporary allocation) arrives in NE; well drilling contractor mobilizes; AID reimburses AFC for initial cattle purchase loan disbursements.

January 15, 1975 First project evaluation held (every 6 months thereafter).

January 31, 1975 L/Comm and L/Credit issued for U.S. procurement and fabrication begins; workshop/housing contractors mobilize; four loan-financed U.S. technicians arrive.

March 15, 1975 First minor U.S. equipment items shipped; first AFC ranch water development contracts let.

June 15, 1975 First minor U.S. equipment items (e.g. RMD and WD support equipment) arrives at site; vehicles shipped; RMD releases IFB for remaining 32 houses.

August 31, 1975 Wajir workshop and first RMD houses completed; housing IFB's opened (second tranche).
Remaining minor U.S. equipment items, plus vehicles and pumps, arrive on site.

December 31, 1975 Heavy construction equipment shipped.

February 28, 1976 Heavy construction equipment (Dixey No. 3 plus replacements for Dixey No. 2) arrives on site; Japanese construction unit transferred out.

July 1, 1978 N.E. well drilling program completed; AID makes final reimbursement under AFC ranch program.

July 1, 1979 N.E. pan construction program completed; final disbursements under loan; loan closed out.

C. Procurement Plan

It is anticipated that the services of a procurement agency in the United States will be utilized for all initial equipment and materials purchases. Subsequent procurement of spare parts will be accomplished through local dealers or, in the case of smaller items having no dealer facilities in Kenya, through a U.S. supply house under letter of credit arrangement. Items of local cost such as petroleum products will be purchased initially with GOK working funds, with subsequent reimbursement from the loan upon presentation of paid invoices.

Due to (a) the need to maintain a simplified spare parts inventory under difficult and highly mobile working conditions, and (b) the need to standardize new equipment with existing, single-manufacturer equipment to be intermingled with new equipment in the two Dixey units, it is recommended that proprietary procurement for certain items of heavy construction equipment be authorized. A waiver request is attached as Annex IX.

D. Project Evaluation.

The proposed loan fully endorses the aim of the AID grant-financed National Range and Ranch Development (NRRD) Project - to increase livestock production to meet growing domestic demand and to earn foreign exchange through exports of livestock and livestock products - and its development implications for various segments of the Kenyan economy, including:

- a. for pastoralists and ranchers an improved means of gaining a-livelihood;
- b. for farmers in high potential areas increased numbers of better quality stock and feeder animals from range areas;
- c. expanded employment opportunities on ranges, ranches, feedlots and marketing facilities;
- d. for the national economy, increased commercialization of a major economic sector, increased domestic product and increased foreign exchange earning potential.

As in the case of the NRRD project, key indicators of achievement will be the extent to which range lands are brought under improved management schemes and the annual rate of increase in animal marketings.

For purposes of measuring and evaluating these indicators as well as the physical outputs of the loan project, the following project resources will be utilized:

1. The Coordination Unit

Overall responsibility for monitoring and evaluation of this Project as well as the First Livestock Project will rest with the Project Coordination Unit (PCU).

For the collection of baseline data PCU will rely primarily on Range Management Division, LMD and the Census and Monitoring Unit. RMD staff, in planning and designing the NE grazing blocks will develop data on the resource characteristics of the area, including the status of the range, stock management, range carrying capacity, water resource potential, cattle and human population. This data will be periodically updated by the extension staff of RMD as project development proceeds. Offtake data, including cattle origin/destination, numbers, weight, age, etc., will be provided by LMD. The Census and Monitoring Unit will provide up-to-date baseline data on the interface between livestock and wildlife in the ranching areas as well as the Northeast Province and Isiolo district. This will make available information for identification of livestock development areas together with the ability to assess possible conflict with wildlife population.

In addition to its day-to-day monitoring and evaluation actions, PCU will be assisted as necessary by consultants, universities or other appropriate agencies, in the conduct of periodic special studies including a farm management and accounts survey based on a stratified sample; a survey of the ecological, social and economic impact of the Project, and investigation of the efficiency of various functions critical to the project's success such as cattle marketing and meat processing.

Funds have been budgeted under the Project specifically for the evaluation and monitoring work of PCU (\$100,000) and for the Census and Monitoring Unit (\$775,000 for the 4-year project period and \$50,000 annually thereafter).

2. Range Trend Survey Teams

The A.I.D. loan will provide approximately \$38,000 over the 4-year project period for the equipping and operation of two two-man range trend survey teams. The GOK will pay the salaries of these four men (approximately \$56,000 for four years) and assume all costs for the teams in year 5.

These teams, under RMD supervision and operating out of Garissa in the Northeast Province, will have the specific task of establishing, monitoring and re-reading range trend studies to determine the effectiveness of the range management program. The continual monitoring of NE project areas by these teams will permit early detection of evidence of overgrazing and overstocking. It is anticipated that within five years of activation of these teams, study results should be available to indicate to the Block Managers and District Range Officers whether their management practices are causing range improvement or range deterioration.

3. Six-Month Donor Review Missions

For this project the concept of the normal semi-annual IBRD project review mission will be expanded to include participation by representatives of each of the other donors as well as the GOK. These field reviews, to be led by the IBRD's Regional Mission for East Africa (Nairobi), will provide not only for joint donor reviews and evaluation of all phases of the project but also an opportunity for greater donor coordination, an open forum for sharing problems and experiences associated with respective donor segments of the project, and identification of project elements needing modification, reinforcement and/or reconsideration.

VIII. GENERAL EFFECTS OF THE LOAN

A. Impact on the U S Economy and Balance of Payments

It is recommended that the loan finance Code 941 (U S and selected developing countries) and local costs. Approximately 34 percent of the loan or \$3.2 million will constitute non-Kenyan source/origin procurement; it is anticipated that virtually all of this procurement will be from the United States. The remainder of the loan will be used to finance local costs which will yield a net negative effect on the loan on the U S balance of payments.

B. Effect on Private Enterprise

Almost every facet of the loan will directly benefit either Kenyan or American private enterprise. The investments in water facilities development and improved range management in the northeast will greatly improve the economic and social prospects of the resident pastoralists who own and take benefit from the entire livestock herd in that area. AFC ranch development loans will go exclusively to private borrowers. From the standpoint of procurement virtually all equipment and materials will be supplied by private enterprise suppliers in the U S principally and to a lesser extent in Kenya. It is further expected that the loan financed technical assistance will be furnished from private, non-governmental sources.

C. Environmental Impact

The Project has major environmental ramifications particularly with respect to the development of permanent water in previously arid areas. To avoid the potentially disastrous effects of cattle overstocking and overgrazing the Project supports a strong program of range management both in the Northeast Province and in the areas to be developed for ranching. Although not financed by AID, wildlife protection is also a major component of the Project. For a full discussion of this Project's contribution to the conservation of range-land and wildlife see Annex III.

IX. CONDITIONS PRECEDENT AND COVENANTS

In addition to the standard conditions for legal opinion and specimen signatures, the following special conditions and covenants to the loan agreement will be discussed and negotiated with the GOK:

A. Conditions Precedent

1. Initial Conditions

- a. IDA credit effective and copy of signed and binding agreement available.
- b. Budget provisions adequate for first year of project.

2. Conditions to Disbursement for Equipment (other than Maintenance)

- a. Evidence of satisfactory arrangements for equipment servicing of purchase of spare parts, including establishment of a separate logistic and accounting section for Northeast Province Water Development.
- b. Evidence that an equipment maintenance program will be undertaken, including guidelines for maintenance of equipment.
- c. An equipment utilization schedule, including a firm plan for year one and a projected plan for succeeding project years.
- d. Executed contracts for A.I.D.-financed technical personnel under the Northeast Range Development Sub-Project.
- e. Completion/availability of suitable housing for A.I.D.-financed technical personnel under Northeast Range Development Sub-Project.

3. Conditions to Disbursement for Maintenance Equipment

- a. Evidence that arrangements have been made for recruitment of technicians.
- b. Evidence that the Wajir shop and warehouse facilities have been completed (or will be completed prior to arrival of maintenance equipment).

B. Covenants

1. Northeast Covenants

- a. GOK agrees to reconstruct pans previously completed in or adjacent to project area as required to maintain range carrying capacity.

b. GOK agrees to take steps whenever appropriate to declare developed blocks control areas under the crop production and livestock ordinance.

c. GOK agrees that not more than 20 percent of project production will be exported to U.S.

d. GOK shall be responsible for operation and maintenance of reservoirs and boreholes and best efforts for establishing program whereby costs are recovered from beneficiaries.

e. Preparation and approval by RMD and WD of block management plans prior to development of each individual grazing block.

f. Recommendations of consultant's evaluation of A.I.D.'s technical assistance program for range development will be fully considered and agreement reached between A.I.D. and GOK for implementation of these recommendations.

2. AFC Covenants

a. AFC agrees to suitably advertise all cattle purchase or sale transactions of 100 head or more financed under the project and facilitated by AFC, excepting those cattle purchases or sale transactions with LMD or KMC.

b. AFC assures that Group Ranch Chairmen, delegees or Ranch Managers will be encouraged to participate in purchases.

c. AFC will make its best efforts that for this project it intends to abstain from engaging in business as intermediary to cattle sales to and from recipients of subloans from AFC.

See Annex XIV for a list of the undertakings negotiated with the GOK by the World Bank.

CHECKLIST OF STATUTORY CRITERIA
DEVELOPMENT LOAN FUND

Many of the questions require only yes or no answers. Others, however, must be answered more fully. In those cases, a specific reference to explicit discussion of the matter in the loan paper will suffice. But where the loan paper does not deal explicitly with a matter that clearly requires more than a yes or no response, sufficient response must be made to indicate that the matter has been appropriately considered.

The following abbreviations are used in the checklist:

FAA - Foreign Assistance Act of 1961, as amended, incorporating amendments effected by the Foreign Assistance Act of 1973.

App. - Foreign Assistance and Related Agencies Appropriations Act, 1974.

MA - Merchant Marine Act of 1936, as amended

Space for answers is provided in the margin to the right of each question. This form must be made a part of the Capital Assistance Paper.

I. COUNTRY PERFORMANCE

A. Progress Towards Country Goals

1. FAA §§ 201(b)(5), 201(b)(7), 201(b)(8), 208. Discuss the extent to which the country is:

(a) Making appropriate efforts to increase food production and improve means for food storage and distribution.

(b) Creating a favorable climate for foreign and domestic private enterprise and investment.

(c) Increasing the people's role in the developmental process.

The Kenyan Government has emphasized in both the current and 1974-79 Five-Year Plan the need to increase domestic agriculture production through the expansion and diversification of crops and to make the benefits of such expansion available to the people.

Kenya has a mixed economy which is receptive to foreign investment. There are about 120 US firms with a direct investment of \$95 million with assets of approximately \$225 million, primarily in petroleum distribution, light manufacturing food processing and tourism.

It is standing policy of the Kenyan Government to include the populace in the developing process. There are continuing programs which involve the people in the planning and execution of development both through the formal government structure and through the solicitation of voluntary efforts.

(d) Allocating expenditures to development rather than to unnecessary military purposes or intervention in other free countries' affairs.

Kenya maintains a foreign policy which eschews active hostility towards other governments and as a consequence has been able to keep its military expenditure at a very low level.

(e) Willing to contribute funds to the project or program.

Refer to Section V of the CAP.

(f) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangement; and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

The Kenyan Government has committed itself to effecting those reforms which will provide a more equitable social, political and economic system while avoiding where possible those measures which would exacerbate the process of development. Kenyan society is one which is basically open with an absence of civil repression.

(g) Responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

It is basic and public policy that the Government is to devote its energies to improving the lot of its citizens. There is every indication that the Government pursues this policy in fact as well as word.

B. Relations with the United States

1. FAA §620(c). Is the government indebted to any U.S. citizen for goods or services furnished or ordered where: (a) such citizen has exhausted available legal remedies, including arbitration, or (b) the debt is not denied or contested by the government, or (c) the indebtedness arises under such government's, or a predecessor's unconditional guarantee?

NO

2. FAA §620(d). If the loan is intended for construction or operation of any productive enterprise that will compete with U.S. enterprise, has the country agreed that it will establish appropriate procedures to prevent export to the U.S. of more than 20% of its enterprise's annual production during the life of the loan?

A covenant covering this clause will be included in the loan agreement.

3. FAA §620(e)(1). Has the country's government, or any agency or subdivision thereof, (a) nationalized or expropriated property owned by U.S. citizens or by any business entity not less than 50% beneficially owned by U.S. citizens, (b) taken steps to repudiate or nullify existing contracts or agreements with such citizens or entity, or (c) imposes or enforced discriminatory taxes or other exactions, or restrictive maintenance or operation conditions? If so, and more than six months has elapsed since such occurrence, identify the document indicating that the government, or appropriate agency or subdivision thereof, has taken appropriate steps to discharge its obligations under international law toward such citizen or entity? If less than six months has elapsed, what steps if any has it taken to discharge its obligations?

There has been no such nationalization, expropriation, nullified contracts or discriminatory taxes against the US citizens.

4. FAA §620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property, and failed to take appropriate measures to prevent a recurrence and to provide adequate compensation for such damage or destruction?

There has been no instance in the recent past when there was any need for the Kenyan Government to act in protection of or compensate for loss of US property.

5. FAA §620(l). Has the government instituted an investment guaranty program under FAA §221(b)(1) for the specific risks of inconvertibility and expropriation or confiscation?

6. FAA §620(o); Fisherman's Protective Act of 1954, as amended, Section 6. Has the country seized, or imposed any penalty or sanction against, any U.S. fishing vessel on account of its fishing activities in international waters? If, as a result of a seizure, the U.S.G. has made reimbursement under the provisions of the Fisherman's Protective Act and such amount has not been paid in full by the seizing country, identify the documentation which describes how the withholding of assistance under the FAA has been or will be accomplished.

7. FAA §620(q). Has the country been in default, during a period in excess of six months, in payment to the U.S. on any FAA loan?

8. FAA §620(t). Have diplomatic relations between the country and the U.S. been severed? If so, have they been renewed?

No, relations between the US and Kenyan have always been on a friendly and cooperative basis.

C. Relations with Other Nations and the U.N.

1. FAA §620(i). Has the country been officially represented at any international conference when that representation included planning activities involving insurrection or subversion directed against the U.S. or countries receiving U.S. assistance?

No, as far as is known

2. FAA §§620(a), 620(n);

Has the country sold, furnished, or permitted ships or aircraft under its registry to carry to Cuba or North Viet-Nam items of economic, military, or other assistance?

No, as far as is known

3. FAA §620(u); App. §108 What is the status of the country's U.N. dues, assessments, or other obligations? Does the loan agreement bar any use of funds to pay U.N. assessments, dues, or arrearages?

Kenya has not been delinquent in any obligations to the UN. Funds under this loan will be fully committed to the loan activity and cannot be used for any other purposes.

D. Military Situation

1. FAA §620(i). Has the country engaged in or prepared for aggressive military efforts directed against the U.S. or countries receiving U.S. assistance?

NO

2. FAA 8620(a). What is (a) the percentage of the country's budget devoted to military purposes, and (b) the amount of the country's foreign exchange resources used to acquire military equipment? Is the country diverting U.S. development assistance or P.L. 480 sales to military expenditures? Is the country diverting its own resources to unnecessary military expenditures? (Findings on these questions are to be made for each country at least once each fiscal year and, in addition, as often as may be required by a material change in relevant circumstances.) Has the country spent money for sophisticated weapons?

Approximately 5 percent of Kenya's budget (including the Development Budget) was to be spent during the 1973-74 fiscal year for military purposes. A negligible amount of foreign exchange has been spent for purchase of military equipment, none of which would fall into the classification of 'sophisticated weapons'.

II. CONDITION OF THE LOAN

A. General Soundness

-- Interest and Repayment

1. FAA §§ 201(d), 201(b)(2)

Is the rate of interest excessive or unreasonable for the borrower? Are there reasonable prospects for repayment? What is the grace period interest rate; the following period interest rate? Is the rate of interest higher than the country's applicable legal rate of interest?

The loan terms are reasonable for the borrower and within his capacity to repay. The grace period rate is 2 percent with an interest rate following that period of 3 percent. The rate of interest is below the legal rate of interest in Kenya.

-- Financing

1. FAA § 100. Has the host country provided assurances that it will meet at least 25 percent of the project costs in cash or kind?

Refer to Section V of the loan paper.

1. FAA s 201(b)(1). To what extent can financing on reasonable terms be obtained from other free-world sources, including private sources within the US?

Kenya has received financing on reasonable terms from the United Kingdom, the IBRD, the Federal Republic of Germany, Canada, Italy, Sweden, Norway, the Netherlands, and the United Nations but has needs in excess of these sources. There are no private sources in the US which provide loans of this type.

-- Economic and Technical Soundness

1. FAA §§ 201(b)(2), 201(e). The activity's economic and technical soundness to undertake loan; does the loan application, together with information and assurances, indicate that funds will be used in an economically and technically sound manner?

The IBRD and the Kenya Consultative Group of Donors have found the GOK to be competent in the management of its economy and development programs. AID concurs in this finding, as substantiated in the C A P.

2. FAA §611(a)(1). Have engineering, financial, and other plans necessary to carry out assistance, and a reasonably firm estimate of the cost of assistance to the U.S., been completed?

Yes, refer to Sections IV and V of the loan paper.

3. FAA §611(b); App. §101. If the loan or grant is for a water or related land-resource construction project or program, do plans include a cost-benefit computation? Does the project or program meet the relevant U.S. construction standards and criteria used in determining feasibility?

The loan plans include a cost-benefit computation. The project meets U S construction standards and criteria in determining its feasibility.

4. FAA §611(e). If this is a Capital Assistance Project with U.S. financing in excess of \$1 million, has the principal A.I.D. officer in the country certified as to the country's capability effectively to maintain and utilize the project?

Yes, see Annex II.

B. Relation to Achievement of Country and Regional Goals

-- Country Goals

1. FAA §§207, 201(a). Describe this loan's relation to:

a. Institutions needed for a democratic society and to assure maximum participation on the part of the people in the task of economic development.

The overall purpose of this loan is the development of livestock production in Kenya. This activity will directly and indirectly affect the lives of those people living in an contiguous to areas benefiting from the loan inputs.

b. Enabling the country to meet its food needs, both from its own resources and through development, with U.S. help, of infrastructure to support increased agricultural productivity.

The principal by-product of this loan will be expanded production of beef which is an important source of protein in the Kenyan diet. The loan will also be applied to areas which have been marginal producing areas in the agriculture sector because of their semi-arid and poor soil conditions thus increasing Kenyan agriculture potential.

c. Meeting increasing need for trained manpower.

Not applicable to this loan.

d. Developing programs to meet public health needs.

Not applicable to this loan.

e. Assisting other important economic, political, and social development activities, including industrial development; growth of free labor unions; cooperatives and voluntary agencies; improvement of transportation and communication systems; capabilities for planning and public administration; urban development; and modernization of existing laws.

Refer to Section II of the loan paper.

FAA §201(b)(4). Describe the activity's consistency with and relationship to other development activities, and its contribution to realizable long-range objectives.

Kenyan Government with the assistance of various donors has been for the past ten years developing the infrastructure which is necessary to support a major livestock development program. This loan is part of a World Bank consortium loan which is specifically designed to pick where these previous efforts have stopped.

3. FAA §201(b)(9). How will the activity to be financed contribute to the achievement of self-sustaining growth?

The end product of this loan is expected to be a growing and self-sustaining beef industry spanning the spectrum of production, processing and marketing.

4. FAA §201(f). If this is a project loan, describe how such project will promote the country's economic development, taking into account the country's human and material resource requirements and the relationship between ultimate objectives of the project and overall economic development.

Since the activity to be financed under this loan will be devoted to overcoming the barriers to livestock production in areas of marginal agriculture potential, it will permit Kenya to maximize the utilization of its land resources and provide increased opportunities for people in the project areas to better their way of life.

5. FAA §201(b)(3). In what ways does the activity give reasonable promise of contributing to development of economic resources, or to increase of productive capacities?

See Section II.

6. FAA §281(b). How does the program under which assistance is provided recognize the particular needs, desires, and capacities of the country's people; utilize the country's intellectual resources to encourage institutional development; and support civic education and training in skills required for effective participation in political processes.

See Section II.

7. FAA 8601(a). How will this loan encourage the country's efforts to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions?

8. FAA 8202(a). Indicate the amount of money under the loan which is: going directly to private enterprise; going to intermediate credit institutions or other borrowers for use by private enterprise; being used to finance imports from private sources; or otherwise being used to finance procurements from private sources.

9. FAA 8611(a)(2). What legislative action is required within the recipient country? What is the basis for a reasonable anticipation that such action will be completed in time to permit orderly accomplishment of purposes of loan?

(a) One of the planned results of this loan is to enable Kenya to expand its export of beef. (b) By providing the base for expanded production of cattle, the loan will foster private initiative and competition. (c) One of the major beneficiaries of the loan will be cooperative ranch schemes. The activities of the Agriculture Finance Corp, a farm/ranch credit institution, will also expand. (d) Not applicable. (e) By expanding the livestock sector of the economy each of the three will have to improve their operations to handle the production, processing and marketing of beef. (f) Not applicable.

The amount of the loan going to private industry, which is to be channeled through the Agriculture Finance Corp, a credit institution, will be \$3.7 million. The amount being imported from private sources will be \$2.6 million.

There is no legislative action required on the part of Kenya.

-- **Regional Goals**

1. FAA 8619. *If this loan is assisting a newly independent country, to what extent do the circumstances permit such assistance to be furnished through multilateral organizations or plans?*

This loan is being made as part of a consortium loan organized by the World Bank.

2. FAA 8209. *If this loan is directed at a problem or an opportunity that is regional in nature, how does assistance under this loan encourage a regional development program? What multilateral assistance is presently being furnished to the country?*

The loan is not specifically regional in nature although it will effect directly some sections of Kenya more than others. It is not however conducive to a regional development program. Kenya receives a broad spectrum of assistance from the World Bank and the United Nations.

3. Relation to U.S. Economy

-- **Employment, Balance of Payments, Private Enterprise**

1. FAA 88201(b)(6); 102, Fifth. *What are the possible effects of this loan on U.S. economy, with special reference to areas of substantial labor surplus? Describe the extent to which assistance is constituted of U.S. commodities and services, furnished in a manner consistent with improving the U.S. balance of payments position.*

This loan will have no detrimental effect on the US economy. Refer to Section VIII of the loan paper for the answer to the second question.

2. FAA #6012(b), 636(h). What steps have been taken to assure that, to the maximum extent possible, foreign currencies owned by the U.S. and local currencies contributed by the country are utilized to meet the cost of contractual and other services, and that U.S. foreign-owned currencies are utilized in lieu of dollars?

The US owns no Kenyan local currency. For information re amount of local currency to be contributed to the project by Kenya, refer to Section V of the loan paper.

3. FAA #601(d); App. #109. If this loan is for a capital project, to what extent has the Agency encouraged utilization of engineering and professional services of U.S. firms and their affiliates? If the loan is to be used to finance direct costs for construction, will any of the contractors be persons other than qualified nationals of the country or qualified citizens of the U.S.? If so, has the required waiver been obtained?

The Agency has utilized the services of a U S firm for the conduct of a feasibility study relevant to this loan. None of the contractors utilized will be other than U S or Kenyan nationals.

4. FAA #608(a). Provide information on measures to be taken to utilize U.S. Government excess personal property in lieu of the procurement of new items.

U S Government Excess Property if available and suitable, will be eligible for financing under the loan.

5. FAA #602. What efforts have been made to assist U.S. small business to participate equitably in the furnishing of commodities and services financed by this loan?

The procurement procedures to be utilized under this loan will permit the equitable participation of U S small business.

6. FAA §621. If the loan provides technical assistance, how is private enterprise on a contract basis utilized? If the facilities of other Federal agencies will be utilized, in what ways are they particularly suitable; are they competitive with private enterprise (if so, explain); and how can they be made available without undue interference with domestic programs?

Standard AID contracting procedures will be utilized.

7. FAA §611(c). If this loan involves a contract for construction that obligates in excess of \$100,000, will it be on a competitive basis? If not, are there factors which make it impracticable?

Procurement

1. FAA §604(a). Will commodity procurement be restricted to U.S. except as otherwise determined by the President?

Yes. Procurement will conform to the limited untying policy announced by the President.

2. FAA §604(b). Will any part of this loan be used for bulk commodity procurement at adjusted prices higher than the market price prevailing in the U.S. at time of purchase?

NO

3. FAA § 604(e). Will any part of this loan be used for procurement of any agricultural commodity or product thereof outside the US when the domestic price of such commodity is less than parity? NO.

4. FAA § 604(f). If this agreement provides for a commodity import program, will the Agency receive prepayment certification from suppliers as to description, condition, eligibility and suitability of commodities? Not applicable

D. Other Requirements

1. FAA § 201(b). Is the country among the 20 countries in which development loan funds may be used to make loans in this fiscal year? Yes

2. App § 106 Does the loan agreement provide, with respect to capital projects, for U S approval of contract terms and firms? Not applicable

3. FAA § 620(k) If the loan is for construction of a productive enterprise, with respect to which the aggregate value of assistance to be furnished will exceed \$100 million, what preparation has been made to obtain the express approval of the Congress? Not applicable.

4. FAA 8620(b), 820(f):

Has the President determined that the country is not dominated or controlled by the international Communist movement? If the country is a Communist country (including, but not limited to, the countries listed in FAA 8620(f)) and the loan is intended for economic assistance, have the findings required by FAA 8620(f) been made and reported to the Congress?

Kenya is not controlled by the international Communist movement.

5. FAA 8620(h). What steps have been taken to insure that the loan will not be used in a manner which, contrary to the best interest of the United States, promotes or assists the foreign aid projects of the Communist-bloc countries?

The standard AID loan provision against comingling will be included in the loan agreement.

6. App. 8110. Will any funds be used to finance procurement of iron and steel products for use in Vietnam other than as contemplated by 8110.

No

7. FAA 8636(i). Will any part of this loan be used in financing non-U.S.-manufactured automobiles? If so, has the required waiver been obtained?

No

8. FAA §§620(a)(1) and (2), 620(p);

Will any assistance be furnished or funds made available to the government of Cuba or the United Arab Republic?

No

9. FAA §620(q). *Will any part of this loan be used to compensate owners for expropriated or nationalized property? If any assistance has been used for such purpose in the past, has appropriate reimbursement been made to the U.S. for sums diverted?*

No

10. FAA §201(f). *If this is a project loan, what provisions have been made for appropriate participation by the recipient country's private enterprise?*

The loan provides for the use of local private enterprise in the construction of boreholes and catchment basins.

11. App. #104. *Does the loan agreement bar any use of funds to pay pensions, etc., for persons who are serving or who have served in the recipient country's armed forces?*

Yes. The loan agreement limits the use of the prohibited purposes.

12. IMA § 901 b. Does the loan agreement provide, for compliance with US shipping requirements, that at least 50 percent of the gross tonnage of all commodities financed with funds made available under this loan (computed separately by geographic area for dry bulk carriers, dry cargo liners, and tankers) be transported on privately owned US-flag commercial vessels to the extent such vessels are available at fair and reasonable rates for US flag vessels. Does the loan agreement also provide for compliance with US shipping requirements, that at least 50 percent of the gross freight revenue of goods shipped under this loan must be earned by privately owned US-flag commercial vessels to the extent such vessels are available at fair and reasonable rates for US-flag vessels? Yes.
13. FAA, Section 481. Has the country failed to take adequate steps to prevent narcotic drugs from entering the US unlawfully? No.
14. FAA, Section 604, e. Has there been compliance with restriction against procuring with AID funds agricultural commodities outside the U S when the domestic price of such commodity is less than parity? Not applicable.
15. App § 110. Is the loan being used to transfer funds to world lending institutions under FAA §§ 209 (d) and 251 (h)? No.

16. FAA § 612 (d). App 113. Does the United States own excess foreign currency and, if so, what arrangements have been made for its release and will local costs be met with excess host country currency (acquired without the payment of dollars) on deposit in the U S Treasury?

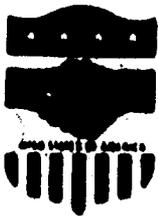
The U S does not own any excess Kenyan currency.

17. FAA § 604(d). Will provisions be made for placing marine insurance in the United States if the recipient country discriminates against any marine insurance company authorized to do business in the United States?

As far as is known, Kenya does not discriminate against any marine insurance company authorized to do business in the US.

App 114. Will the Committee on appropriations of Senate and House of Representatives be notified of the loan at least five days prior to obligation of funds?

Yes.



UNITED STATES OF AMERICA
AGENCY FOR INTERNATIONAL DEVELOPMENT

AID-DLC/P-2024
April 1974

Office of the Director,
P. O. Box 30261,
Nairobi, Kenya.

KENYA LIVESTOCK DEVELOPMENT LOAN

CERTIFICATION PURSUANT TO FAA SECTION 611 E

I, Edward B. Hogan, the Principal Officer of the Agency for International Development in Kenya, having taken into account, among other things, the maintenance and utilization of projects in Kenya previously financed or assisted by the United States, the adequate financial and manpower support given to the Phase I Livestock Development Project, the internally-generated past and proposed contributions of the Kenya Government to the Agricultural Finance Corporation, the continuing support for agricultural education programs, and the demonstration of sound fiscal planning on a national scale, do hereby certify that in my judgment Kenya has shown both the financial capability and human resource capability to effectively maintain and utilize the capital assistance provided under the Livestock Development Loan.

SIGNED: _____

Edward B. Hogan
Edward B. Hogan
Acting Director

DATE: _____

February 22, 1974

ENVIRONMENTAL ANALYSISNORTHEAST PROVINCE RANGE-WATER PROJECTSummary

The information and conclusions presented in this environmental analysis are based on data developed in the feasibility study for the Pilot Range Development Project*; the IBRD appraisal report of the Second Livestock Development Project; the Leo A. Daly Co. report, titled "Kenya Meat Commission Abattoir/Cold Storage Study", and the experience gained by the USAID Mission livestock and range specialists, hydrogeologist and engineers from the implementation of the First Livestock Development Project.

The First Livestock Development Project, sponsored jointly by IDA and Sweden, was initiated in 1968 and had as its principal objectives the increase of beef production by providing credit for ranching enterprises, establishing livestock marketing facilities, rangeland development and disease control. Since 1970 A.I.D. has assisted in the development of a 1.8 million acre pilot area in the Northeast Province through the provision of technical assistance under the National Range and Ranch Development Project. The proposed Second Livestock Development Project, coordinated by the IBRD and based on the findings of an IDA appraisal mission to Kenya in October-November 1972, builds on and expands the scope of the First Livestock Project. The principal environmental protection measure included in the proposed project is the expansion of the range management technique, developed for the conservation of resources in the pilot area, into all aspects of the grazing and ranching program. These aspects include coordinating with the Range Water Division for developing water supplies on range areas, the Department of Veterinary Services for disease control, and the Research Division of the Game Department for collection of data on interaction between wild life and livestock.

The above mentioned environmental protection measures are not considered to have a negative cost effect on the project, as they are all necessary to produce the desired increase in marketable livestock.

It was concluded that the overall effect of this project on the environment is positive. The introduction of good range management practices and the increase of water available for both human and animal consumption will greatly reduce the hardships of the Somali livestock owners, improve their economic and living standards and bring them closer to the mainstream of the Kenyan population. This program will increase the number of cattle and thus increase the protein available in the country.

* Based on development plans included in this 1970 A.I.D.-financed study, a pilot project area comprising three grazing blocks (approximately 2.0 million acres) was undertaken and completed in 1973 with World Bank financing.

The increase in cattle production would not have a detrimental effect on wildlife, in fact in the pilot project areas it was found that additional watering points and the improved range practices reduced overgrazing and actually contributed to an increase in the wildlife population.

Construction planned in support of the project would have the usual adverse short term effects, such as dust and noise, associated with earth moving equipment. There are no natural resources committed to the project that are irretrievable or irreversible.

Environmental Impact and Concerns

There are six major categories of environmental impact to be considered within this project and one major socio-cultural area of concern. These areas of impact or concern are:

1. The impact of track, road, pan, borehole construction and channeling work above the pans (stock watering ponds).
2. The impact of projected more intensive use of the forage resource.
3. The potential impact of overgrazing due to drought, possible range management or livestock marketing inadequacies.
4. The possible introduction of water source diseases including malaria and schistosmiasis.
5. The interwoven effects of and on the pastoralist culture, and the herdsman's resistance to or acceptance of change and regulation.
6. Competition between livestock and wildlife.

Analysis of Impacts and Concerns

1. Construction Activities

Nearly all construction activities will take place on flat gradient lands (0 to 2% gradient) and erosion by water will have no detrimental effect on these lands. The 2,600 miles of 14 foot wide track will be of simple construction and used to provide dry weather access and firebreaks in the range land. Only an occasional section of track, about 100 meters long, will be constructed on slope gradients of 2 to 4%, and some limited water erosion will occur but will be of small overall consequence.

There will be little environmental impact during the construction of the 229 pans which will be used as cattle watering ponds. Wind is the dominant erosive force over much of the Province and a slight increase can be expected in wind erosion on the construction areas until vegetation has been re-established. The effect of borehole drilling on the environment is considered

to be negligible. Although little information is available on the effects of borehole pumping on the water table and the ground water recharge capability, it is the opinion of the USGS PASA hydrologist assigned to the project that in general the recharge capability exceeds the proposed pumping capacity. It is possible that in some local areas heavy drawdown might effect several operating boreholes, and pumping would require close regulation.

Most of the bottom areas where pans will be constructed have only a semblance of a natural drainage system. The drainage system is more often than not simply overland flow. The earth is full of large cracks and holes, caused by the extremely dry conditions, and water from a high intensity rain storm usually disappears into the earth just outside the immediate rainfall area. The storms are typically very small and cover a front from one to three miles wide. Thus, to get a flow to the pans, it is necessary to establish a drainage system above the pans by constructing upstream channelization with crawler tractors and road graders. Due to the flat gradient, these channels do not severely gully and tend to stabilize after the first few rains. Maintenance of these channels will be necessary as they tend to revegetate and lose their effectiveness.

The construction of tracks, pans, wells, etc. will remove about 4,600 acres from the 14,000,000 acre project and the overall effects of the construction activity are considered well within tolerable environmental impact limits.

2. Intensive Forage Utilization

Only about 50% of the rangeland in the Northeast Province is grazed by livestock during the dry seasons. Thus the amount of rangeland that can be grazed during the dry season is the current limiting factor regarding livestock numbers in the Province. Implementation of this project will provide livestock water throughout the project area and in a normal rainfall year, the forage resource will become the limiting factor regarding total livestock numbers. When the carrying capacity of the range has been reached through livestock migrations and natural herd increases, good range management as specified in the block management plans becomes imperative.

A buildup of wildlife numbers is expected in the projected area based upon experience in the pilot project area. While the initial increase is due to wildlife migration, reproductive increases will also be evidenced in the years to come. In the pilot project, elephants increased from practically none to a considerable population and a sizeable increase in Grevy Zebra has been noted. These migrations and increases are a direct result of providing water in hitherto dry areas. This trend in elephant and zebra migrations and increases can be expected to continue in the Phase II project area. Little is known concerning forage competition between the livestock and wildlife of the area. Zebra, Grants Gazelle, Oryx, Dik-Dik and others have foraging habits

similar to cattle and camels. Gerenuk are browsers similar to sheep and goats but are able to browse higher in the bush than sheep or goats.

Many safeguards are built into the livestock stocking rates. When calculating available forage, total forage produced on any given area is first reduced by the amount of bush canopy present, second by the amount of mountains, lava flows and other non-range types of terrain, and finally the amount of forage remaining after the previous two deductions is decreased by 50% to provide a drought reserve, and forage for competing wildlife and fire. Of the remaining 50%, only 60% is used for calculating stocking rates. This results in a very conservative stocking rate for livestock but very justifiably so since the effects of drought or the forage use by wildlife increases can be considerable.

Another safeguard for wildlife is the range management grazing system used. Under this system, assuming 8 pastures in a typical block, 3 pastures would be grazed only during the wet season, 3 pastures would be grazed only in the dry season and 2 pastures would be rested and not grazed in either the wet or dry season. This provides much area for wildlife free of livestock with no outside influences to affect their natural habits.

One conflict between elephants and the pan design has been noted in the pilot project area which must be resolved.

The large pans (5 million U.S. gallons) have been designed with $1\frac{1}{2}$:1 backslopes to minimize evaporation. The plans were to fence the pans and pump the water into troughs for the domestic livestock. The elephants do not respect the fences and go thru them. Other wildlife and livestock follow. The steep backslopes cannot withstand trampling and begin to seek a more natural angle of repose. The earth from the backslopes ends up as sediment in the bottom of the pan, thereby reducing the depth of the pan and hastening pan maintenance. Since wildlife is a great asset to Kenya and since elephants cannot be fenced out, it seems best to design the pans with a flatter back-slope (6:1) and allow wildlife and livestock free access to the water.

Another problem of a similar nature is the fact that about 4 bush fences have been burnt by Somali herdsmen. The apparent reason is that the camel owners do not want to water their camels with cattle. Camel urine is very concentrated and strong. The Somalis do not want the camels in the pan water for this reason and so build small mud troughs at the water's edge and bucket water into these troughs for the camels. Cattle, of course, would trample and ruin these mud troughs so the camel owners seek a watering spot away from the cattle.

While there are potentials for wildlife-livestock use conflicts, none will be unsolvable. Due to the many safeguards built into the project, wildlife-livestock forage competition will not stress the forage resource. Continued application and enforcement of the livestock grazing system in use in the pilot areas will provide for range improvement and increased forage production in the future for both wildlife and livestock.

3. Overgrazing

In spite of the safeguards mentioned under the previous section, the potential exists that overgrazing could become a problem on the project area, if range management practices break down. The project is designed to function and not cause range deterioration even under drought conditions. Experience to date in the pilot project shows that the range management there has been effective and that boreholes and pans with water can be closed to use and pastures receive the deferment or rest intended for them. Evidence to date indicates a strong Range Management Division, with many young dedicated employees who know their jobs and supervision by very able range administrators, will be able to implement the Phase II program.

The effort to increase livestock production in the Northeast Province is a three pronged attack. One portion is the range-water development; the second is increased veterinary services, and the third is livestock marketing. The range-water and veterinary services projects are designed to increase livestock numbers. The livestock marketing project is designed to remove immature and slaughter cattle from the Province in a systematic manner so the economic benefits of the range-water and veterinary services projects can be realized. Phase II of the livestock marketing program involves establishment and refinement of a system of holding grounds with facilities and livestock trails as well as establishment of marketing centers and a fleet of eight cattle trains. Under drought conditions (which may well be normal conditions), trailing of livestock up to 400 miles to market has not been possible. For instance, the last purchase of cattle by LMD (Livestock Marketing Division) in the Buna area was September, 1972. Since that time they have been unable to buy cattle there because of the lack of water necessary to trail them to market. The proposed eight cattle trains (capacity 72 head each) would haul cattle from areas such as this during periods of drought. It is possible that livestock may be produced at a higher rate than they are marketed, and at a certain point in time livestock numbers could surpass the carrying capacity of the range and range conditions would begin to deteriorate. Drought conditions coupled with overstocking and the ever present wind erosion potential could combine to produce long term range vegetation damage or even Sahelian type conditions in local areas. The only obvious and practical safeguard to prevent this is an effective and viable marketing program that has a built-in ability to quickly remove culls, immatures and aged livestock when drought conditions become evident. This will leave only the basic breeding herds on the range and losses and human suffering should not occur. Marketing infrastructure to be financed by the British as part of this project is designed to permit increased off-take, however, because of its importance the effectiveness of this program will be monitored closely during donor supervision missions.

4. Still Water Hazards

Shistosomiasis is a snail borne disease which has infected a large portion of the population of Kenya. Fascioliasis, an economically important disease of cattle, also is snail borne and could become established in the pans. Both the watering pans and any feeder streams would provide a suitable habitat for the intermediate host snails of these diseases. These organisms penetrate the skin of humans or animals when they enter the water. Water for the cattle watering pans is from seasonal streams and rain runoff channels and some snail control will be accomplished by the seasonal drying up of the natural water courses. This action will reduce the numbers of snails and thus interfere with the cycle which creates the disease causing organism, but undoubtedly mollusciciding will be needed to control either of these diseases should they become a problem.

The area in which the pans will be developed is not now considered a malaria area, however, the possibility exists for malaria and filariasis carrying mosquitoes to breed in the watering sites to be established under this project. Tsetse fly breeding would be enhanced if a thick growth of trees line the pans. Control of mosquito breeding sites can best be accomplished through a testing program and the application of insecticides when and where required. Reduced vegetation along pan banks would be desirable to control tsetse flies. The Kenya Government currently carries out such insect control and water testing programs, in order to control any adverse breeding of vectors causing disease. The naturally occurring insecticides used in Kenya are pyrethrum based and not harmful to animals nor do they create adverse residual effects.

5. Socio-Cultural Effects

Experience on the pilot project area indicates acceptance and interest in the project by the Somali people in the area. All of the chiefs and sub-chiefs and about 150 individual livestock owners have been thru a one week training and information school at the Uiriftu Pastoral Training Center. There they become acquainted with the range management system, regulations and what is to be expected of them. Acceptance and understanding has been good. Interest, of course, in new water development is as strong as can be expected but there is also interest in and general acceptance of the range management principles involved. Drought years will strain the entire project system, including the Somali people, and firm measures will be necessary to insure that the established range management program is followed, especially in the utilization of water points. As the Somali sons and daughters become older, acceptance of additional regulations will be easier. Some small permanent settlements are beginning to be established at several of the established boreholes and in one or two generations pastoralism as it is known now may have disappeared.

6. Wildlife

1. General

The rapidly growing tourist industry of Kenya is largely based on the abundance and diversity of the wildlife. Eight National Parks and four Country

Council Game Reserves are one of the focal points of tourist activity; these now produce an estimated Ksh. 24.1 million per annum.

The movements and grazing patterns of the majority of the game species are seasonal in nature; they move in and out of the game reserves as water and grazing vary with irregular rainfall distribution. These migratory movements bring the game population of the parks and reserves into competition with livestock grazing in the areas by increasing stock numbers and over-grazing, has now been augmented by the rapid growth in land adjudication and the establishment of group and company ranches in pastoral range areas adjacent to the game parks.

A certain degree of accommodation between wildlife and cattle is apparent, however, Giraffe, elephant and eland graze or browse vegetation components not utilized by cattle, whereas most of the plains game are directly competitive. Competition can also be indirect; calving wildebeest are regarded as the source of Malignant Mucosal Catarrh and their grazing areas are strictly avoided by pastoral herdsmen. Ratios between the biomass of cattle and game commonly approximate 70:30 in rangeland areas adjacent to game parks. In open range areas where the availability of dry season water limits cattle numbers, the construction of permanent water points usually leads to an increase in both cattle and game numbers.

The reaction of cattle owners to wildlife on grazing land is largely related to their impact on cattle numbers and to the cash income received with or without wildlife. Quantitative data is scanty. It is clear, however, that considerable economic benefits can result from game-viewing, hunting and game cropping, and that in the game parks of Kenya, the direct and indirect returns per unit area of land are substantially higher than on similar land used for traditional pastoralism or ranching.

The most immediate problem in the competition between cattle and wildlife occurs in the wet and dry season dispersal areas of the Nairobi, Amboseli and Masai Mara parks where land adjudication and ranch formation is proceeding rapidly. If game in these new ranching areas are reduced, the tourist income of the associated game parks could decline. The game will be tolerated by local cattle owners, however, only if it represents income to them. In its simplest form, this would involve compensation payable from park revenues for the loss of cattle production. Additional incentives might be added by allowing pastoral group to profit from the hunting, viewing and cropping rights. The measurement of game and livestock grazing pressures should be the basis of control on stock and game numbers, and the balanced control of overall stocking pressure should provide the basis for transfer payments between the tourist centers and associated grazing land owners.

The wildlife component of the proposed Second Livestock Project covers the grazing areas associated with the Nairobi, Amboseli and Masai Mara game reserves. Its three basic objectives would include:

- a. Monitoring of livestock and wildlife distribution and numbers;
- b. Construction of alternative watering facilities for both game and livestock in areas where the closure of park boundaries deprives them of traditional dry season water and grazing;
- c. Compensation for the decrease in income from domestic livestock experienced in those ranching areas where the migratory movement of wildlife from game parks impedes livestock production.

2. The Monitoring Program

The monitoring program would cover about 255,000 km² and include the ecosystems of the Nairobi, Amboseli and Masai Mara parks. It would also cover the area included in the Northeast water development component of the First and Second Livestock Projects and all group and company ranch areas.

The program would collect information on the following items:

- a. Livestock and wildlife numbers in each ecosystem;
- b. Movement patterns in the wet dry seasons;
- c. Changes in habitat and habitat conditions;
- d. Local climate; and
- e. Extent of changes in local human population density and agricultural and livestock husbandry practices.

The aerial census techniques to be used are well-established and currently used by private contractors in Kenya. Ten surveys over a period of 3-5 years are required to establish accurate base data; thereafter an annual census will suffice.

The proposed Project would provide funds for the establishment of a Census Unit within the Research Division of the Game Department. Under the overall guidance of the Project Manager, this unit would have responsibility for the collection, analysis and dissemination of the data to be collected from a combination of aerial and ground surveys and from satellite photography and private research studies. It would also be responsible for recommending the changes required in stocking densities of both domestic stock and wildlife as well as optimal means of accomplishing these changes.

- a. A senior scientist to establish the unit's program;
- b. The in-country training of local Kenyan staff;
- c. The contracting of aerial and ground survey studies to cover 255,000 km² with 10 sample surveys in 3-5 years;

- d. The provision of support services involving climate measurement gauges, office expenses, computer time and film processing and reproduction.

Alternatives Considered

1. No Project

In order to increase livestock production, the proposed project will include the introduction of improved range and water management practices over an increased amount of grazing land. Without the project the present deterioration of range resources would continue and could reach a point where the deterioration might be irreversible. Without the project the potential increase in livestock offtake would not be realized and the GOK would lose considerable economic benefit. No project would mean that the Somali livestock owners and their dependents would continue to exist under extreme hardship, and with little opportunity to improve their low standard of living.

2. Change in Size of Project

Project development has been sized to most efficiently utilize available physical and management resources. The included land is the maximum area of greatest potential and excludes land where return from increased livestock production would be marginal.

A smaller area of development, with the same input, would mean a more intensive effort with fewer people benefiting from the project. The proposed size will directly involve more people initially and the more intensive development will be part of the follow-on program.

THE KENYAN ECONOMY

In terms of overall growth, Kenya's economic performance since Independence has been impressive in almost all respects. During the period since 1964, GDP has grown at an average rate of about 7 percent in real terms, which has allowed significant gains in per capita income despite the high population growth rate. Average per capita income in 1972 had risen to about \$160 which is about the median for African countries. This growth rate has been triggered by a high and growing rate of investment in both the private and public sectors. In recent years, fixed capital formation has accounted for over 25 percent of monetary GDP, which is an exceptionally high investment rate. However, this has inevitably put a strain on Kenya's economic resource base, and subsequently on the balance of payments, despite the fact that Kenya's domestic savings rates (19-20%) is one of the highest in the developing world.

The Government's fiscal and monetary management has been one of the factors responsible for the generally sound performance of the economy. On the fiscal side, the public sector's performance has been very good. In 1964, Kenya had a recurrent budget deficit, a relatively insignificant development budget and depended heavily on external aid. Since then, by virtue of its increasing tax effort and disciplined control on spending, the Government has (i) converted its recurrent deficit into a substantial surplus (which in 1970/71 accounted for 23 percent of all national savings), (ii) expanded its development budget at an average rate of 27 percent a year, and (iii) considerably reduced its relative dependence on external aid. The fact that Kenya achieved these results with only negligible internal inflation and without resorting to expensive forms of external financing makes this performance even more notable.

While Kenya's performance in sustaining a fast rate of overall growth over the past ten years has been very good, some aspects of development have been less satisfactory, and several important issues inevitably emerge as Kenya prepares to embark upon the second decade of development. The most worrying aspect of Kenya's past performance has been the failure to distribute the benefits of development as widely as the Government would like and, in particular, the growing unemployment and the continuing poverty.

In looking towards the ensuing decade, the first prerequisite for launching a more effective attack on unemployment and rural poverty is to maintain or even increase the past rate of growth. However, a number of indicators suggest that it may be more difficult for Kenya to maintain the momentum achieved in the past without some significant adjustments in the pattern of development and the style of management. Capital-output ratios, while still reasonably low on the average, have been rising, both household and public savings show some sign of levelling off, and the increasing resource gap has put pressure on the balance of payments which has exceeded the supply of external capital.

In several respects, therefore, Kenya may be at a turning point in her development and will need to determine how the economy can be made to perform more efficiently. In part the problem arises from the very success of Kenya's past performance: for example, the domestic savings rate and tax efforts have been so good that there may be little room for improvement. But the position is also partly due to the fact that by the end of the first decade Kenya had accomplished many of the more obvious and easy tasks, and that the future planning and management of the economy must inevitably be more complex.

Thus, in agriculture, the impetus provided to the sector by the major programs of land transfer and settlement is slackening, and future development will have to give more emphasis to the difficult task of increasing productivity and employment among the smallholders, ranchers and pastoralists many of whom live on lands which seem to be either too small or in marginal production areas. Similarly, in manufacturing, the process of replacing imports, often at high costs, by encouraging foreign investment, has reached the point of diminishing returns, and Kenya is having to devise a whole new set of measures designed to make manufacturers competitive in export markets, and to foster small businesses in which African entrepreneurs can develop and prosper.

The major emphasis of the recent World Bank Basic Economic Report on Kenya economic report was on agriculture and resource-based manufacturing. Agriculture and related manufacturing use resources more "efficiently" in creating incomes and employment, conserving scarce capital and skilled manpower, redistributing income, generating foreign exchange and perhaps even stimulating savings than other sectors. Moreover, in the context of Kenya, the possible policy dilemma of having to "trade-off" growth against employment (and income distribution) does not seem to arise since both growth and equity goals can be achieved through restructuring the pattern of growth in favor of the directly productive sectors. Rising import prices and the increased cost of fuel is likely to encourage greater use of Kenya's most valuable domestic resources -- land and labor.

In manufacturing, it appears that while Kenya may well have a comparative advantage in agricultural-based processing, the protection given to import substitution industries has not only encouraged the establishment of some inefficient industries and discouraged exports by distorting input prices, but has discriminated against agriculture. Import incentives for efficient resource allocation may result from the incipient moves towards uniform tariffs and incentives for exports which the Kenyan authorities are already contemplating in collaboration with the other two Partner States of the East African Community.

Kenya naturally will face a number of particular problems of her own in restructuring growth. The first is to create the appropriate environment of price and other incentives to induce the private sector to develop

rapidly and make better use of the resources available to it. A second problem Kenya faces is the capacity of the public sector to accelerate growth in the preferred sectors, particularly in agriculture. The problem is largely one of skilled manpower, and it is clear that Kenya's development potential will continue to be curtailed by the scarcity of skills for a long time. The recent World Bank Basic Economic Report and the Agricultural Sector Survey have both emphasized the resultant problem of low absorptive capacity in agriculture. For industry, the dearth of managerial skills adversely affects small-scale business development and hinders efforts to screen new large-scale industrial projects.

In adopting its new development plan, covering the period 1974-78, the Kenya Government has already taken an important step towards initiating the kind of economic reforms noted above. However, following the recent increases in oil prices and the expected rise in the cost of other imports, the ambitious targets of the plan may have to be reduced, and some adjustments will need to be made to the investment program. Preliminary estimates indicate that the net additional cost of oil to the Kenya economy in 1974 will be around \$65 million, and that, taking into account the anticipated cost increases in other imports, Kenya may face a residual external financing gap of about \$100 million in 1975. The Kenya Government has already started to draw up an emergency program to deal with the new situation. The likely components of this program are reinstatement of import controls and a curtailment of development effort in the short term, together with an accelerated move towards restructuring the pattern of long-term growth. The initial response of Government has been positive and realistic and the new stringencies imposed on the economy by the rapid deterioration in the terms of trade will probably accelerate some of the necessary long-term economic reforms. But, if the momentum achieved in development is not to be too severely curtailed, the Kenyan economy will need additional external capital during the next few years of adjustment. Much of this will have to be on concessionary terms, and some non-project assistance will probably be required towards the end of 1974 according to preliminary forecasts of the balance of payments position. The forthcoming meeting of the Consultative Group is expected to give particular attention to Kenya's short term prospects and aid requirements.

Kenya's outstanding external debt increased from \$258 million at the end of 1963 to \$510 million at the end of 1972, of which \$353 million had been disbursed. Thus, since Independence, Kenya has accumulated external debts at about 7-3/4 percent a year, or only slightly faster than the average rate of growth of GDP. In addition to its own external public debt, Kenya is also jointly responsible, together with the other two Partner States, for the debts incurred by the East African Community and its institutions, which amounted to some \$277 million in September 1972. About half of the Community's external debt is held by the Bank Group. If a notional one-third of the Community's total debt is allocated to each Partner State, Kenya's debt service burden is increased by roughly a quarter, but still represents less than 6 percent of her foreign exchange earnings.

THE LIVESTOCK SUBSECTOR IN KENYA *A. INTRODUCTION AND BACKGROUND

Lying astride the equator on the eastern coast of Africa, Kenya has an area of 582,750 km² and a wide variety of climatic and ecological conditions ranging from semi-desert to temperate. The population is now estimated at about 12 million, and is growing at a rate of about 3.4% per year. About 80% of the population lives in rural areas and depends on agriculture for its livelihood.

Kenya's Gross National Product (GNP) in 1971 was about US\$1.9 billion, with a per capita income of US\$160. The average annual rate of increase in Gross Domestic Product (GDP) in real terms for the past eight years has been over 6.5%. Kenya's exports accounted for about 27% of GDP over the past five years. In 1971 total exports were about US\$480 million (including tourism earnings and commodity exports) and imports were about US\$585 million. The growth rate of imports and export has averaged 12% and 7.5% p.a. respectively during 1964-71, resulting in a deterioration in the trade balance.

1. The Agricultural Sector

Agriculture accounts for 31% of GDP and 60% of the total value of exports. Basic food crops are maize, wheat, millet, potatoes and plantains/bananas. Main export crops are coffee, tea and pyrethrum. Livestock production, valued at about US\$71 million annually, constitutes about 4% of GDP and contributes about 8% to total exports.

Kenya may be roughly divided into areas of high agricultural potential - these comprise about 20% of the country and include the highlands and coastal belt regions - and the range areas, suitable mainly for the extensive production of livestock for both subsistence and commercial needs. Out of Kenya's total area of about 58 million ha, only about 4 million ha are presently cultivated. It is estimated that an additional 8 million ha is suitable for cropping and improved pasture. Rangelands occupy about 80% of the total area (46 million ha) and contain about 10% of the total population; these have considerable potential for livestock and wildlife development. Under a rangeland adjudication program, land ownership is vested in individuals or registered groups; at the present time an active program is being carried out in the Rift Valley Province.

2. Livestock

Livestock represents a major national resource to Kenya. The livestock population comprises about 9 million cattle (including 0.5 million dairy

* SOURCE: IERD Appraisal Report - Second Livestock Project

cows) and about 3 million sheep and goats. About half are concentrated in the densely populated agricultural areas and the other half are widely scattered over the sparsely populated rangelands. About 0.5 million head are found on large-scale commercial ranches; these are the main source of quality beef production. Growth in the national herd has averaged about 2% over the past decade. About 800,000 head of cattle are slaughtered annually. Only about 285,000 head are marketed through commercial channels, resulting in a commercial off-take rate of about 4% - half of which comes from commercial farms and ranches and half from traditional pastoral areas. Domestic per capita beef consumption* is high in comparison with countries in Eastern Africa. Exports of livestock were valued at about US\$16 million in 1971, an increase of 24% over 1970. In the previous five years, however, beef exports had stagnated at about US\$8 million annually.

* (between 13 and 14 kg)

3. Animal Health

Rinderpest has been successfully controlled by a compulsory vaccination program involving about 0.75 million cattle per year. Government has also made progress in the control of other important diseases which currently limit animal movement and production. These are East Coast Fever, Trypanosomiasis, Contagious Bovine Pleuropneumonia and Foot and Mouth Disease (FMD). During the past five years 40,000 km² has been established in or around Central Province as a FMD free zone. About 0.8 million cattle are vaccinated each year with appropriate FMD vaccine types. Outside this area FMD is endemic in the livestock and wildlife populations. Pleuropneumonia is endemic in Northeast Province, but has been prevented from spreading to other areas by strict Government control on livestock movement and by the vaccination and quarantine of all marketed animals.

4. Wildlife

Wildlife is an important natural resource and Kenya has paid considerable attention to conserving its unique population of wild animals. The main commercial uses of wildlife resources are viewing, hunting and cropping for meat and products. Of these viewing is by far the most important, and wildlife is considered a major tourist attraction. Kenya's rapidly growing tourist industry earned about US\$68 million in 1972 (20% of foreign exchange earnings) and almost 600,000 visited national game parks and reserves.

There are eight national parks and four County Council game reserves in Kenya with a total area of about 24,500 km². The largest national park, Tsavo, has an area of about 20,576 km². Although due to different grazing and browsing behavior wildlife and domestic animals are in some respects complementary in their utilization of rangelands, they often compete for the same scarce feed and water resources; there are also negative interactions through disease transmission and predation. There is, therefore, an inherent conflict in the projected development of rangelands for beef production and the goals of wildlife conservation programs. This conflict is of immediate concern in the vicinity of national parks and game reserves, where rangelands are being actively adjudicated. Wildlife will be endangered in many areas

unless their unrestricted movement over these rangelands is assured. ^{1/} Government is seeking to alleviate the problems by providing alternative water supplies outside the wildlife reserves in order to control the movement of livestock into these areas, and by compensating ranch owners for permitting wildlife on their property. Government has agreed that compensation would be made in the form of transfer payments from income generated by the wildlife parks.

5. Marketing and Processing

All existing livestock markets, stock routes and holding grounds are owned and operated by the Livestock Marketing Division (LMD) of the Ministry of Agriculture. LMD acts as a buyer of last resort, but is the largest supplier of cattle from Northeast Province, as private traders are unwilling to undertake the risk and expense associated with Pleuropneumonia vaccination and quarantine requirements. In 1972 LMD purchased about 18% of total cattle marketed (50,000 head) and purchases were almost entirely from Northeast Province. In many areas marketing facilities are inadequate or non-existent and it is Government's intention that LMD upgrade these by providing essential infrastructure in all areas.

The Kenya Meat Commission (KMC) represents the most important segment of the meat processing industry. It owns and operates two large meat packing plants at Athi River and Mombasa. With current improvements the processing capacity of these facilities will be about 1,000 and 300 head of cattle respectively. Sixteen KMC licensed abattoirs (improved slaughter slabs) owned by local government authorities slaughter about 90,000 head of cattle and about 90,000 sheep and goats. In addition local butchers and private slaughtering for home consumption accounted for about 0.5 million head of cattle and 2.5 million head of sheep, goats and calves.

KMC has a monopoly over exports of meat and meat products. About 50% of its total production is exported, and for the year ending October 1972, exports comprised about 10,000 m tons of canned corn beef, 150 m tons of meat extract and 2,500 m tons of chilled and frozen beef. Most of the canned beef was exported to the U.K. and the chilled and frozen boneless cuts have recently been sent to Italy, Spain and Switzerland. Although the Athi River plant is within the disease free zone and is generally regarded as up to export standards, its proximity to areas where FMD is endemic makes it necessary on some occasions to accept cattle from these areas and consequently makes it difficult to meet import requirements on disease grounds for certain European countries.

^{1/} A UNEP/FAO Wildlife Management Project costing about US\$2.5 million (of which Kenya Government contributed 40%) was initiated in 1971 to provide research into wildlife cropping and the integration of wildlife and cattle ranching.

6. Government Services

Responsibility for agricultural services rests with the Ministry of Agriculture. The Range Management Division is staffed with about 360 professional and technical employees and receives substantial assistance from USAID range advisors and FAO/UNDP specialists. In addition to field and extension activities, the Division is also charged with responsibility for initiating research on rangelands. The Range Water Division, which also receives considerable technical assistance from USAID, is responsible for water supplies on range areas. It is adequately staffed and its overall performance has been satisfactory. The Department of Veterinary Services is actively involved in the implementation of a program for control of the important diseases which limit cattle movement and production. Education and training services have recently been expanded. Sufficient veterinary graduates are being trained in the University of Nairobi, which now also provides degree training in General Agriculture. There is no university degree level training in animal husbandry and range management, but a considerable number of students receive training abroad each year under bilateral programs. At the present time there is an insufficient output of university level staff, and supplemental staff will continue to be recruited overseas. Sufficient technical staff will be provided from Egerton College's three year diploma course in range management, and from the Animal Health and Industry Training Institute (AHITI) at Kabete.

7. Agricultural Credit

The Kenya banking system consists of a central bank, seven commercial banks, the Agricultural Finance Corporation (AFC), the Cooperative Bank, and several statutory boards for crop promotion. The Central Bank exercises little control over agricultural lending except by setting the prime interest rate. The commercial banking system as of June 30, 1971 had total advances of Ksh 2,080 million, of which 11% was direct lending for agriculture to about 7,500 farmers and agro-industrial corporations. The Cooperative Bank loan advances at June 30, 1971 amounted to Ksh15 million, of which about Ksh8 million was provided for production finance. Certain statutory boards provide credit in kind to 75,000 farmers for the production of crops for which they are the single marketing channel. Apart from these institutions AFC is the main credit channel for small and medium-scale farmers. As of March 31, 1971, AFC loan advances were about Ksh200 million to some 14,000 farmers. Interest rates on agricultural credit are in line with those for other purposes. Commercial banks charge 8 to 9% and AFC 8%; co-operative members are charged 10% by their societies.

8. The First Livestock Development Project

The first livestock development project with a total project cost over a 5-year period of about US \$11.4 million was financed by IDA and SIDA (Sweden) with equal contributions of US \$3.6 million. The principal objective of the project was to increase beef production by providing credit for four different types of ranching enterprises. It also provided facilities and services for livestock marketing, range water development on communal land, and disease control. Under the project credit was extended for the first time to traditional pastoralists to assist them in the transition from a subsistence to a market-oriented economy.

The organization and management of the First Livestock Project was the responsibility of AFC, and the head of its Ranch Section acted as project manager. This arrangement was cumbersome as the project manager, located in AFC, had neither the power nor the status necessary to influence the government agencies.

The project was slow in getting underway, mainly due to organizational and administrative delays. There were problems in recruiting qualified staff, legal difficulties with land titles and loans, and delays in establishing a credit system for group and company ranch development. The project picked up momentum during 1970. By March 1972, funds for ranch development had been fully committed, with 90 applications approved compared with 60 projected at appraisal. The greater number reflected lower group and company ranch lending offset by an underestimate of demand for commercial and individual ranch loans. Individual ranch loans were 37 compared to an estimated 10 and commercial loans 39 compared with 20; group ranch loans totalled 9 rather than the estimated 20, and company loans 5 rather than 10. Financing of the increased number was made possible by an overestimate (about 70%) of the size of the loan required for a commercial ranch. For the project as a whole, long-term loans for fixed investment were generally overestimated and short-term loans for steer purchases were seriously underestimated. Loan categories were revised in 1972 to reflect actual demand.

The livestock marketing component has helped LMD to increase its cattle purchases from 15,000 in 1968/69 to 50,000 in 1971/72. Field visits by IDA staff indicate that borrowers have derived at least the financial benefits forecast at the time of appraisal. Even though the number of group loans fell short of the projected total, this concept represented an innovative means of ranch development. Taking into account the delays in land adjudication, the legal difficulties, and the fact that the project areas reserved for group ranches proved too

restrictive, the results achieved were encouraging. A particularly significant feature has been the willingness of semi-nomadic cattle owners to participate in group and company ranches, and of small livestock owners to form companies to own and operate commercial ranches in the higher potential areas. The first project has, therefore, broken new ground in making credit available to pastoralists and small herd owners and has encouraged Government to prepare a larger and more comprehensive Second Livestock Project.

B. LIVESTOCK PRODUCTION

The land area of Kenya is about 583,000 km², about 20% of which has agricultural potential. The remainder is mainly rangelands with varying degrees of aridness and suitable only for extensive beef production.

Agriculture is the most important sector of Kenya's economy, accounting for 31% of GDP and 60% of the total exports and engaging 80% of total population (12 million). Gross agricultural marketed production was US\$234 million in 1971, of which US\$71 million (30%) was contributed by livestock and livestock products. The growth rate (1966-1971) for livestock and livestock products was about 6% p.a.; the rate for all agricultural marketed production was about 4% p.a. The value of livestock production in relation to the rest of the sector increased from 2% in 1970 to 30% in 1971 as a result of decreased agricultural production due to drought and a reduction in the price of coffee and tea.

The livestock subsector contributes a small share to Kenya's external trade. Livestock imports are negligible; exports of livestock and livestock products were about US\$12.6 million in 1970 and accounted for 6.3% of total commodity exports. In 1971 the export value for livestock and livestock products was US\$15.7 million, accounting for 7.6% of total commodity exports. The potential for increased livestock production is considerable because of the favorable environment and demand for beef and beef products on world markets.

The Second Development Plan emphasizes the need for increased productivity and provides for an increase in the quantity and quality of inputs into agriculture. In the livestock subsector the plan calls for a decrease in the time taken to bring cattle to slaughter weights, improvement in the transfer of cattle from range areas to slaughter plants, and the transfer of immature cattle from marginal breeding lands to areas of greater potential to increase the weight of beef produced per animal and to permit an increase in the number of breeding cows to be kept on these ranges.

1. Beef Cattle Production

The beef cattle industry is divided into a traditional and a modern commercial sector. The cattle population of about 9.0 million is about equally distributed between the rangelands, most of which have a rainfall of 600 mm or less, and the better agricultural areas. The pastoral tribes of Kenya, who occupy most rangelands, keep cattle primarily for subsistence

consumption. As milk is the major subsistence food, the proportion of cows in the pastoral herds is large; in times of severe scarcity (drought) few male calves are reared and offtake rates are therefore relatively low. Cattle sold are primarily steers of about 250-270 kg liveweight. Unproductive and aged cows are used largely for local consumption. Mature females make up about 43% of cattle numbers and milk yield per lactation is of the order of 250-350 kg. Calving rates are believed to average 65%. About 44 ha and five head of cattle are available per head of pastoral population. The distribution of cattle, human populations and cattle sales, classified by farming categories, is given in Table 1.

The commercial cattle sector consists mainly of large ranches in the higher rainfall zone. The ranches were mainly European-owned, but an increasing number are now farmed as company ranches with share holdings owned by a large number of Africans. Crossbred cattle of European and Zebu origin are common on these ranches and dairy ranching is often practiced. Production coefficients are substantially higher than in the pastoral areas. There are about 1.8 ha of pasture per animal unit and the livestock/human population ratio is 1.3, including urban areas.

Livestock husbandry in the range subsistence areas is similar to that in the pastoral zone, but greater population densities and higher rainfall lead to a much greater reliance on agriculture for basic food production. The grazing area per animal unit is about two ha and there are about 0.9 animal units per head of human population.

Animal production in the higher potential smallholder districts is more commercialized, particularly with respect to dairy production. Present stocking rates are about 0.9 ha per animal unit with about 0.8 animal units per human. Milk yields range from 850 to 2,000 kg per lactation. As in the range subsistence and pastoral zones, the heavy grazing pressure leads to the early slaughter of many male calves and the preferential use of limited feed supplies for lactating cows.

Ranch Development

The project would support the development of group, company, cooperative and commercial ranches. Group ranches are production enterprises in which 50 to 100 families collectively hold title to land, maintain agreed stocking levels, market surplus in rotation, herd their livestock as sex/age aggregates and yet continue to own their livestock as individuals. Debt liability and loan servicing are a group function; repayment is effected by a "per head of cattle" charge to individual cattle owners for services rendered by the group. Profit sharing to members is based on the sale of their own animals minus collections for loan servicing. Company ranches are enterprises in which land is leased from Government or County Councils and prospective shareholders put up cattle or a cash equivalent for shares. Animals are collectively owned and disposed of, and profits shared according to established agreement. Management are paid and operate under a policy-making board of directors. There are generally at least 50 shareholders per company, and in the case of 'directed'

companies (Government representative on board of directors), the number of shareholders is much larger. Cooperative ranches are similar in nature except for the method of shareholding. Commercial ranches are owned by one or more individuals or a company on freehold land; they are usually located in high agricultural potential areas. Ranches owned by European settlers are being gradually purchased by Kenyans. Usually a large number of Kenyans (200-500) form a company or cooperative to provide the funds to purchase an existing ranch. Part of the ranch is normally used as a settlement area and the remainder is operated as a commercial ranch with paid management.

3. Breeds

The indigenous Zebu, with a total of about 8.8 million head, is the most important type of livestock in Kenya. Two subtypes and a number of intermediate stages can be identified. The Large East-African Zebu which occupies the Northern and Northeastern range areas, totals about 1.6 million head. The Small East-African Zebu is indigenous to the highlands and Southern range areas, and totals about 5.1 million head. Some 2.1 million head are of intermediate size. The major part of the country's commercial beef cattle is composed of improved Boran and its crosses with exotic breeds; there are about 500,000 such animals in Kenya. The majority of dairy cattle are owned by smallholders and settlement farmers in Central province, and these are increasing rapidly in the high potential areas of Western Kenya. The annual increase in the number of dairy cows is currently about 8%, and a large proportion of the dairy herd are crossbreds of exotic dairy breeds and the indigenous Zebu.

4. Animal Health

The major animal disease problems of Kenya include Trypanosomiasis East Coast and other tick-borne fevers, Contagious Bovine Pleuropneumonia and Foot and Mouth Disease (FMD). Rinderpest, once a major problem, has been almost completely eliminated. The standard of veterinary services in Kenya is good and an active program of disease control is being pursued.

Disease control problems are aggravated by the movement of wild game, the unauthorized movement of cattle in spite of rigid restrictions, and the largely free movement of cattle across national frontiers.

Foot and Mouth Disease (FMD) is widespread and represents an important constraint to the proposed export of meat to Europe. The disease is endemic in the main pastoral regions where outbreaks are now controlled by restrictions on stock movement. In the central areas of the country, biannual vaccination of about one million cattle has largely eliminated FMD. The disease causes minimal production losses in indigenous Zebu cattle and widespread vaccination of these animals is of questionable economic merit. The crossbred cattle of the higher rainfall areas show greater losses when infected and their protection by vaccination and movement control is most desirable. As carcass meat for export must come from the present FMD disease free zone, the economic merit of any expansion of this controlled

area is closely linked to the potential surplus of good quality cattle for export and to the price differential available between those markets (e.g. Europe) requiring meat from FMD disease free areas and those which are less stringent in this requirement (Libya, Hong Kong, Saudi Arabia and Zaire). The price differential between these markets is presently minimal.

An FMD control policy for Kenya necessitates the minimization of the FMD threat to existing control areas and the inclusion in new vaccination campaigns of those areas with a rapidly expanding proportion of grade cattle. An extension of the FMD campaign on the scope proposed by Government, (three million additional head vaccinated/year) may not represent the most cost-effective use of resources. The threat of FMD infection from Masailand could be avoided by minimizing cattle movement by constructing fattening and slaughter facilities in Karok and Kajiado, rather than by initiating an expensive and operationally difficult FMD campaign in Masailand. The construction of two feed lots in this area would ensure sufficient capacity to market the offtake from the proposed group ranches. The areas where the proportion of grade cattle numbers are increasing and which are net surplus areas in terms of cattle movement include parts of Machakos, Kitui, Baringo and Elgeyo Marakwet. These are likely to be the priority zones for any extension of future compulsory vaccination campaigns. Smallholder areas with increasing numbers of grade cattle, but which are net import areas, are of less strategic importance and can be protected by voluntary vaccination campaigns.

Contagious Bovine Pleuropneumonia has been confined to the North-east provinces and all animals moved from this area, as well as from Masailand, are subject to a most rigorous program of bloodtesting and vaccination. Cattle scheduled to go to the large farm areas of Kenya for further fattening must pass three consecutive tests at least six weeks apart before they are released from Government holding grounds. This testing and clearance procedure frequently requires up to six months. The holding ground charges are passed on to the herd owners in the pastoral areas by lower purchase prices. Feeder cattle released from the holding ground in 1971 realized about Ksh1.40 per kg liveweight, whereas prices paid in cattle markets in the Northeast were of the order of Ksh0.90 per kg liveweight. The indirect costs of combating the disease are thus very high. The feasibility of less stringent test requirements should be examined in an effort to minimize marketing costs and reduce the incentives for illegal cattle movement.

Trypanosomiasis is confined to the coastal strip and certain river lands. Seasonal movement of cattle in such areas, coupled in some cases with drug-induced trypanocidal protection, provides reasonably satisfactory interim measures to tsetse fly clearance.

East Coast Fever is the most important of the tick-borne fevers. These are controllable by regular dipping, and increasing evidence now shows that there is a substantial decline in calf mortality in all breeds following such treatment.

Beef measles (cystercicosis) is common, particularly in the Southern areas of Kenya. The meat from such animals must be frozen for 10 days prior to use and infected carcasses are subject to a price penalty of about 25%.

5. Nutrition

In spite of serious disease problems, high death losses and low herd productivity are mainly attributable to nutritional causes. Periodic droughts and the consequent concentration of cattle on permanent water points cause high mortality, while the low energy, protein and mineral content of all rangelands, particularly in the dry season, limits the productivity of both breeding and dry stock. Improved dry season watering facilities, better grazing movement, the stratification of breeding and fattening areas, and where practical, the strategic supplementation of grazing resources by protein and phosphorus supplements provide, in association with disease control, the key husbandry practices required to increase beef cattle numbers and offtake rates in Kenya. Intensive and semi-intensive fattening of immature and unfinished animals on improved pastures in better areas and in feedlots is required to add weight to range-bred cattle.

6. Agricultural Research

Responsibility for agricultural research in Kenya is widely dispersed among various government departments, the East African Research Organization (EAFRO) and the University of Nairobi. Rangeland research is largely limited to the survey work being carried out in association with an FAO/UNDP project, while pasture improvement studies in the higher rainfall areas are confined to small-scale work at Kitale. Research into veterinary problems is more developed with Government, EAFRO and FAO/UNDP active in this field. Research on animal production problems is mainly confined to the fattening studies of FAO/UNDP at Lanet and the work of German and Dutch bilateral aid groups on cattle breeding and intensive dairying respectively. FAO/UNDP are now commencing studies on sheep and goat production.

Fields of study in which large returns for small expenditures might be expected include:

- a) Incorporation of pasture legumes into rangelands;
- b) Optimal stocking rate and stock management systems for the alternative production systems of rangeland farmers and cattle keepers;
- c) Simple rearing systems for young calves bred in feed-deficit areas;
- d) The role of minimal strategic supplementation of minerals, protein and energy in raising the productivity of breeding stock during periods of nutritional stress; the supply distribution and credit needs for these supplements also require study.

7. Intensive Beef Cattle Feeding

The optimal strategy for developing the beef cattle industry of Kenya involves breeding immature cattle in the drier pastoral areas and fattening these animals to heavier weights on improved grazing and/or in feedlots. The present average weight of cattle being killed is around 130 kg carcass weight, and most animals killed are capable of considerable improvement in weight and quality by further feeding. In the short term, the addition of weight to these animals is the simplest and least expensive means of increasing national beef production.

Pasture improvement, particularly in the rangeland areas, is virtually unexplored in Kenya. In the higher rainfall areas where improved pastures can be established there is little information available on grass production and utilization, although it is estimated that stocking rates could easily be doubled with the adoption of modern techniques. However, competition for land use and lack of modern techniques limit cattle fattening.

The price structure for cattle of varying weight and quality reflects the present lack of adequate fattening facilities and the resultant shortage of well-finished stock. The weight and price for the main carcass grades are given in Table 2.

In 1970 the offtake of immature steers from the exporting districts of Kenya's traditional farming areas was 297,000 head. A further 32,400 head came from Somalia and Ethiopia, giving a total "source" in Kenya of some 329,700 head. (Meyn 1971). Of these, only 153,000 were sold and the remaining 177,000 were slaughtered locally. These 153,000 head, 65,000 Boran and 88,000 smaller Zebu, are now available for possible fattening. In addition, the 177,000 immatures now consumed locally could be considered as potentially available for purchase as feeder steers.

The availability of high energy feed for cattle is determined largely by the supply of maize. The marketed production of maize, about 300,000 tons annually, represents only 25% of total production. The introduction of hybrid maize varieties is greatly increasing crop yields, and export surpluses in excess of 400,000 tons annually are now projected by the Development Plan. Also about 15,000 tons per annum of maize bran and maize germ meal are available from local maize milling. As each animal fattened consumes approximately 0.4 tons of high energy feed, grain and grain by-products are available to fatten over one million head of cattle, numbers far in excess of the cattle available. The export parity price of maize export is estimated at about Ksh17 per bag.

The economic aspects of intensive beef feeding in Kenya have been examined in considerable detail over the last four years by an FAO/UNDP project near Nakuru. The promising results of this project have led to recent private investment in feedlot capacity (presently estimated at 30,000 head per year). These private feedlots are located in the disease free

zone and are located so as to maximize financial returns. Further public investment in strategically placed feedlots outside the disease free zone is now required in order to maximize offtake rates from range areas, to minimize disease control problems and to provide additional value-added to cattle slaughtered. It is these feedlots that the proposed Second Livestock Project would support.

In Kenya the killing out percentage of fattening cattle increases by approximately one percentage unit for each 15-18 kg of liveweight gain. Cattle weight and carcass grade are correlated; Boran cattle improve their grade to fair average quality or better when liveweight reaches about 340 kg.

Feed costs vary with the energy density of the ration and the varying cost of ration components. The average and relatively constant cost of a medium energy ration providing one kg of liveweight gain per day is about 8.6 Kenyan cents per Megacalorie (approx. Ksh24 per 100 kg dry matte) or Ksh1.8 day Boran steer. Non-feed costs including yard, management, interest and cattle losses add a further Ksh0.86 per animal per day.

The conversion efficiency of feed to carcass gain is approximately 40 to 45 Megacalories per kg, depending on age and weight (approximately 7 kg dry matter per kg liveweight gain in the 250-350 kg weight range and 8:1 in heavier cattle). Investment and financial projections for a feedlot fattening 6,400 head on an area of 500 ha is given in Annex 6, Table 14. Silage would be grown on 160 ha each, and a second crop used only for grazing would be grown in the short rains. Improved pastures would account for 300 ha, and with second crop grazing is estimated to provide for a liveweight gain of 24 kg per animal purchased (450 kg/ha on pasture and 116 kg on crop grazing). A further 40 ha would be in feedlots, roads, etc., (1,600 head yard capacity). Production coefficients and prices are summarized below:

Production Coefficients and Prices

Average Purchase Weight (kg)	240
Average Price/kg (incl. freight) (Ksh)	1.85
Average Price head (Ksh)	450
Liveweight Gain Grazing (kg)	25 (60 days)
Liveweight into Feedlot (kg)	265
Liveweight out of Feedlot (kg)	340
Days on Feed	75
Dressing Percentage	51
Carcass wt Sold (kg)	175.6
KMC Price (Ksh)	711
Conversion Ratio (kg D.M./kg gain)	7:1 /1

/1 Excluding current bonus of 5% for feedlot cattle.

C. LIVESTOCK MARKETING

The rapidly growing world demand for beef provides Kenya, which has about 9 million cattle and about 80% of its total area in rangeland (180,000 square miles), with a unique opportunity to increase beef exports. The main constraints to increased production include:

- a) Difficulties in marketing cattle from the rangeland areas due to inadequate marketing facilities and disease control regulations involving costly vaccination and quarantine; and
- b) Controlled beef prices leading to depressed prices to cattle producers which in turn lead to depressed offtake rates and overstocking.

Kenya's beef production is stratified; cattle are bred on the rangeland and moved for fattening to high potential grasslands or feed lots. Cattle are moved on the existing stock route network from two surplus regions, Northeast^{1/} and the South^{2/} (Map). The Northeast is an underdeveloped semi-arid region, with endemic Pleuropneumonia (2% incidence). Northeast cattle are required to undergo stringent disease control^{3/} procedures before being moved and an average of four to five months elapse between purchase and sale. All other provinces are without Pleuropneumonia, but FMD is endemic outside the disease free zone. Veterinary regulations require that cattle be vaccinated against strains "A", "O", "C" and "SAT II" before being moved, and cattle cannot be moved from an FMD outbreak area.

Pleuropneumonia controls impose severe constraints on the movement of cattle by foot, but infected cattle may be moved by truck provided they are intended for slaughter. Besides adequate disease controls, the existing stock route/holding ground system lacks such basic facilities as water and physical infrastructure. Cattle moved on these routes exhibit a high mortality and live weight losses through lack of feed and water. Due to the lack of water, cattle cannot be moved from the Northeast except immediately after rain.

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- ^{1/} Includes Carissa, Isiolo, Mandera, Marsabit, Samburu and Wajir Districts.
 - ^{2/} Includes Baringo, Kajiado, Kitui, Lamu, Narok, South Nyanza, Tana River, Turkana and West Pokot Districts.
 - ^{3/} All reactors to the Pleuropneumonia test are slaughtered immediately. All non-reactors must be vaccinated and retasted eight weeks later; any reactors are slaughtered immediately. Rest at six week intervals continues until the whole herd has passed through consecutive tests.

ious disease controls, inadequate stock route/holding grounds, and lack of regular markets are the three principal constraints to regular movement of cattle from the producing to the consuming areas. The livestock marketing component of the proposed Project aims at overcoming these constraints.

1. The Livestock Marketing Division (LMD)

The Livestock Marketing Division (LMD) of the Ministry of Agriculture has a staff of about 500 and is responsible for ensuring that range livestock producers are provided with market outlets which return the highest possible prices. Although LMD has responsibility for developing livestock marketing throughout Kenya, priority has been given to developing facilities to serve the Northeast.

LMD purchased about 50,000 cattle ^{1/} in 1971/72 and expects to purchase 55,000 cattle ^{2/} in 1972/73. Funds for cattle purchase come from a Kenyan Government grant of KSh1 million operated as a trading account. In 1971/72 the expenditures under this account were KSh753,000; the estimate for 1972/73 is KSh1 million.

The majority of cattle purchased by LMD originate in the Northern pastoral areas of Kenya. Purchases are made at auctions organized by LMD, with LMD as the major (usually the only) buyer. During the past three years the cattle purchased were 60% immatures and 40% slaughter stock, at an average price of Ksh250 and average weight of about 250 kg. Purchased cattle are then moved to one of the LMD's two major holding ground complexes, Isiolo or Bodhai/Bargoni.

Movement is mainly on foot, but recently three cattle transport trains ^{3/} financed under the first project have been used. Since the bulk are still moved on foot, LMD's purchasing is heavily dependent on favorable climatic and quarantine conditions. If water and grazing are available along the stock route, the herds are broken into lots of 200 animals and one lot per day is moved 15 to 20 miles. Experience with cattle trains has been encouraging and LMD is emphasizing movement by lorry; this would reduce dependence on rainfall and quarantines and would enable LMD to hold markets at regular intervals. Although Kenya has a network of stock routes (approximately 5,000 miles) and holding grounds (500,000 acres), facilities at the existing holding grounds are inadequate and additional grounds are required.

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- ^{1/} It purchased 15,000, 32,000, 29,000 cattle in 1968/69, 1969/70 and 1970/71 respectively. (Source: LMD records).
 - ^{2/} By October 1972 it had purchased 33,000 animals in that year.
 - ^{3/} Tractor pulling two trailers (72 cattle/trip).

2. Livestock Marketing Component

The proposed livestock marketing component would provide the necessary marketing infrastructure and services on a country-wide basis and would enable LMD to move cattle from rearing to finishing areas or slaughter points. The component has three parts:

- a) Development of markets and transport service;
- b) Development of stock routes and holding grounds; and
- c) Development of sheep and goat markets.

The Project would establish 5 large (500 head/day) and 26 small (200 head/day) cattle markets and would provide 5 trains and 10 cattle trucks. ^{1/} It would provide water points and physical structures on stock routes and holding grounds, and would develop about 500,000 acres of additional holding grounds. The Project would also establish markets for sheep and goats in Turkana, Marsabit and Isiolo.

a. Markets

The markets would be constructed on holding grounds and would provide a sales yard, a loading ramp and a weighbridge. Five large markets ^{2/} would be located in Lamu, Garissa, Wajir, West Pokot, and Isiolo Districts, and the twenty-six small markets ^{3/} would be located in Marsabit, West Pokot, Kara Pokot, South Nyanza, Kajiado, Kitui and Machakos districts (Map, IBRD 10311). Large markets would hold monthly sales and would have a throughput of about 30,000 cattle/year. Small markets would hold sales every two weeks and would have a throughput of about 135,000 cattle/year.

b. Cattle Transport

The cattle transport fleet would include five cattle trains and ten cattle trucks. The cattle trains would transport cattle from the Northeast and the cattle trucks would transport from Narok, Kajiado and other districts in the South and East. After about four years the train and truck fleets would have the capacity to transport 57,000 and 72,000 animals per year respectively (Table 1). With motorized transport cattle may be moved from the Northeast during the dry season and on foot during the wet season. The number of cattle passing through the market/stock route system are given in Table 2.

^{1/} Tractor with one trailer (36 animals/trip).

^{2/} At Bargoni, Garissa, Wajir, Kacheliba/Kong-elai and Garba Tula.

^{3/} At Marsabit, Kisaunat, Kasei, Migeri, Macalders Mine, Unidentified, Nakor, Ngorengora, Suswa, Emarti, Kajido, Mile 46, Kitengela, Basil, Namanga, Kuku, Mashuru, Emali, Athi Tiva (Kamutei), Kangondi, Mutiko, Mwangi, Machakos, Kiangini, Koma Rock and Makueni.

The projected cattle offtake and the projected number passing through the marketing system in the Northeast are given in Table 3. Incremental offtake from the Northeast is estimated to reach 52,000 after 10 years, 30,000 of which are generated by the marketing system and 22,000 by grazing scheme developments.

Projections for cattle offtake from the South are given in Table 4. The incremental offtake from market and ranch developments is 43,000 by year 10, 10% of which may be attributed to market development. The number of cattle moved by year five is estimated at about 58,000; the remaining 118,000 would move over stock routes on foot.

c. Stock Routes and Holding Grounds

The proposed Project would provide supplemental services where facilities are lacking. Land clearing, 17 boreholes, 108 surface water points, 48 spray races/dips, 72 fenced cattle paddocks with crushes would be provided on about 0.5 million acres of new holding grounds. Development details are given in Table 5. It is expected that by Year 5 about 160,000 animals will be moved through the stock route system; about 40,000 of these will be from the Northeast.

d. Sheep and Goat Markets

Sheep and goat markets would be established in Turkana, Marsabit and Isiolo. Although a minor component of the Project, this is a first step in providing outlets of small stock. ^{1/} Sheep and goats are mainly consumed by producers in rural areas but it is desirable that urban consumption of mutton be encouraged and developed.

e. Costs

The cost of the proposed livestock marketing component over a three-year period is estimated at Ksh25 million (US\$3.5 million). (Details are given in Annex 6, Table 19.) The relatively high foreign exchange cost, about US\$2.1 million, is due mainly to the purchase, operation and maintenance (for one year) of the transport fleet and the development of water points.

^{1/} National flock estimated at five million sheep and five million goats in 1972.

f. Technical Assistance

The proposed Project provides technical assistance in the form of a co-ordinator for organizing markets, one transport officer for the first year, five maintenance supervisors for five years who will train local counterparts, and one cost accountant to develop an accounting framework which identifies the cost of each component of LMD's marketing operations.

g. Benefits

The livestock marketing component would:

- a) Increase livestock offtake through better market facilities;
- b) Reduce mortality and weight losses in transporting animals; and
- c) Regularise the flow of cattle to ranches and slaughter plants.

Estimates of the incremental cattle marketed from the Northeast and the South are given in Tables 3 and 4. The benefits associated with transport, based on a UNDP/FAO ^{1/} study and local experience, are summarized as follows:

Losses in Transporting Cattle

	Northeast		South	
	With Project	Without Project	With Project	Without Project
<u>Trekking Cattle</u>				
Mortality Rate (%) ^{/1}	4	4	2	4
Weight Loss (%) ^{/2}	8	10	4	6
<u>Trucking Cattle</u>				
Mortality Rate (%)	2	-	1	-
Weight Loss (%)	5	-	3	-
<u>Price/kg Liveweight (Ksh)</u>				
On-range	1.25	1.25	1.25	1.25
At Sale Point	1.75	1.75	1.75	1.75

^{/1} Losses due to deaths en route.

^{/2} Weight loss in transit.

^{1/} Transport of cattle from North Kenya, Axelson G.R. UNDP/FAO Nairobi.

Benefits from regularizing the flow of cattle, better utilization of processing capacity etc., although important, are difficult to quantify and therefore are not included in the rate of return calculations. The estimated rate of return is 19%.

h. Employment and Income Distribution Effects

By year five the proposed livestock marketing component would create additional employment for 900 unskilled and 150 skilled workers through the operations of the markets and stock routes. Of these, 200 unskilled and all the skilled would be directly employed by the LMD; the remaining 700 unskilled would be used as herders on the stock route system. The incremental offtake from the pastoral areas will result in increased incomes for the producers. In the Northeast alone it is estimated that an additional 30,000 animals will be marketed by year 10. With a value of KSh5.0/animal, this involves an injection of an additional Ksh470,000 into the region.

i. Comparison of Cattle Trucking vs. Cattle Trekking.

The objective is the development of an integrated cattle transport system which would permit trekking as well as trucking. The relative advantages of the two approaches depend on the specific routes; in the Northeast trucks have the advantage of permitting year round movement, thus facilitating regular markets and better overall utilization of range resources. In the FAO study cited above, Axelsen has compared the two systems of transport. He concluded that trekking should be used over short distances (less than 150 miles) when the stock route has adequate feed and water facilities and where weight and mortality losses do not exceed 8%.

The two modes of moving cattle from El Wak to Isiolo (330 miles) are compared in Table 6 under the assumption that the same number of cattle are moved. Transport by truck, however, is capital and foreign exchange intensive, with high recurrent costs which in turn are foreign exchange intensive; when shadow prices are used the economic rate of return is about 10%. This, however, is a narrow basis for comparison given the substantial inter-relationships between Project components. Cattle trucking is considered worthwhile since it permits cattle movement on a year round basis from the Northeast.

j. Financial Impact of the Project

LMD is at present operating at a loss; it incurred an estimated loss of Ksh83,000 in 1971/72. Its main revenue is the margin between

sale and purchase price of cattle. In 1971/72 the average purchase and sale prices were Ksh246 and Ksh267 per animal respectively. The margin was thus only Ksh21, and was substantially below the cost incurred per animal sold of Ksh53.

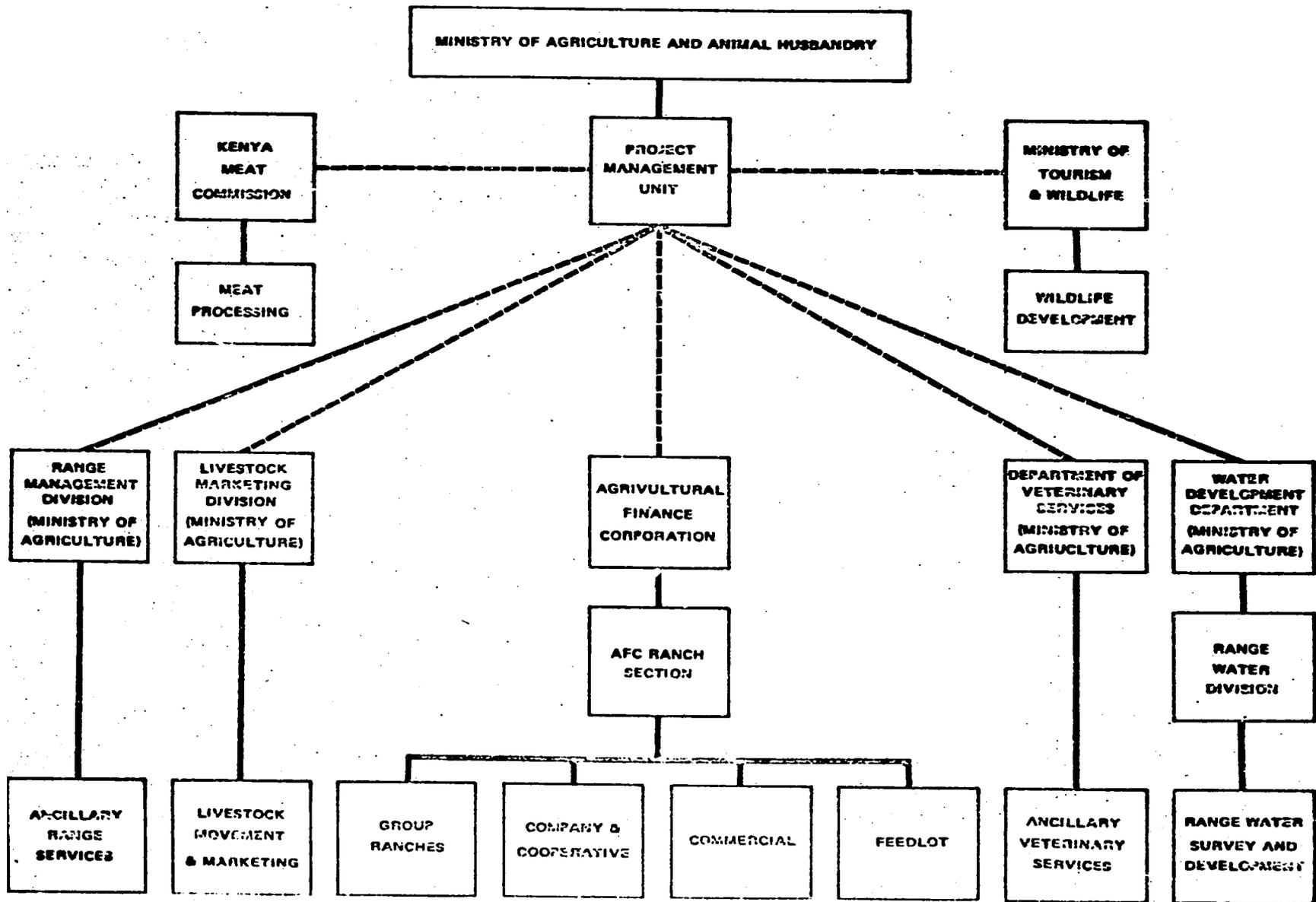
In order to finance its cattle purchases, in 1970 the Government of Kenya gave LMD a grant of K£1 million to operate a trading account. LMD's inability to operate regular markets has forced it to buy cattle in large numbers and to hold them for substantial periods of time (up to 9 months); this has tied up its capital. In a normal commercial operation the interest charges on the capital alone would have been about Ksh50,000 /year, over and above the Ksh83,000 loss incurred. Cumulatively, such losses would be unbearable without subsidies from Government.

The Project is expected to increase the number of cattle marketed. The markets would be held regularly and as the result of the increased transport capacity the average holding time for cattle would be less than a month. In addition, the margin between sale and purchase price would be increased from about Ksh0.20/kg liveweight to about Ksh0.50/kg liveweight. Furthermore, a market charge of Ksh5/animal would be imposed. The stock route/holding ground charge would be maintained at Ksh 20/animal. A projection based on these prices and charges (Annex 6, Table 22) indicates that LMD would make a profit in the first year, and would gradually increase its surplus from K£111,000 in year 1 to over K£200,000 by year 5. Interest charges are not reflected in the projection. It is estimated that the trading account of K£1 million should be adequate to finance yearly cattle purchase of up to 300,000 animals, 1/ and that LMD can cover interest charges from its projected surpluses. Regular operation of markets and a steady flow of cattle through the system should enable LMD to operate as a financially viable entity, and technical assistance is included in the Project to ensure that these objectives can be realized.

It is proposed that LMD organize its operation under two sections: one dealing with the marketing and transporting operations in the North-east, and the second with the South. This specialization would be useful in view of the special problems presented in the Northeast.

1/ 300,000 animals/year is equivalent to about 25,000 animals/month or about K£400,000 per lot. If the average holding period is 2 months then about K£800,000 will be tied up during any one time interval.

KENYA
LIVESTOCK DEVELOPMENT PROJECT
PROJECT ORGANIZATION CHART



NORTHEAST PROVINCE RANGE DEVELOPMENT*

A. Land Use

1. General Condition and History of the Landscape

(a) Area Comparison

Kenya's Northeast Province, with a surface area of about 49,000 square miles comprises about 21 percent of the country's total area.

(b) Weather

The annual rainfall at Garissa in the south central part is about 12.7 inches. The southern extremity of cattle range in the Province receives nearly 25 inches of annual rainfall but the bulk of the Province is fairly well represented by the record at Garissa.

"Normal" weather in the Province provides two growing seasons and two dry seasons annually. Each wet-dry weather cycle is normally sufficient to permit forage plants to develop and mature. Thus two range forage crops per year are usually produced although almost a total loss of one crop and even occasionally of both crops may be experienced through periodic droughts extending through two growing seasons, especially on small local areas. Small areas are often missed by the "narrow front" thunder showers that do occur. The daily maximum temperature is usually in the high 80s or low 90s throughout the year. It is perpetually warm or hot and usually dry.

(c) Topography, Barriers and Elevation

The topography of the southern two-thirds of the Province is flat, with naturally vegetated, mostly red sandy clay and/or grey to black loam soils. Complete access is hindered in some local areas by dense bush, but otherwise there are practically no barriers to livestock. The elevation ranges from less than 600 feet along the Ewaso Ngiro (Lak Dera) to about 1,600 feet south of Banane.

(d) Vegetation

Vegetation and soil are deteriorated where they have been subject to continuous excessive grazing by livestock. Such areas are normally limited to within about six miles of permanent water sources or along heavily used driveways.

(e) Industry

Livestock production now supports most of the people living in the Province.

*SOURCE: Development Plan and Feasibility Study on a Pilot Development Project, Northeast Province, Kenya.

(f) Range Resources and Disciplines

Wherever dominant climax grasses are being maintained in good vigor and density, they are good forage producers, especially in the deeper soils. They are preferred and readily taken by cattle in both the wet and dry seasons and are adequately nutritious (depending on the degree of maturity) to provide satisfactory gains.

The delicate balance between good forage producing grasses and low or non-producing "bush", annuals, or bare ground, is easily upset by the impact of continuous livestock grazing over extended periods. This is true of preferred forage plants where and when they are found in low rainfall areas common to semi-arid climate. There is ample evidence to indicate that good vigor, density and production can be maintained on the forage producing grasses, where basic non-continuous grazing management practices are employed. Conversely, there is also ample evidence to confirm that the range resource could be rapidly destroyed wherever new permanent water sources were created and used by livestock without following prescribed grazing management practices.

The area has the essential climate, topography, soil and vegetation suitable for the managed production of livestock within the above listed natural disciplines.

(g) Current Land-use Pattern by Cattle - Water Oriented

The present land use consists of the nomad herdsmen following the rain with their cattle during the rainy season, and retreating back to the seriously depleted ranges adjacent to the widely separated permanent water sources, for the duration of the dry seasons. In this process the cattle are dispersed over the larger areas with no permanent water points, for only a very brief period during the rains, but during the dry season which invariably follows, the cattle are necessarily concentrated within nine miles or less, of permanent water. Distances of over one hundred miles between permanent water points are typical in many areas during the latter part of the dry season. Many, or perhaps even most, cattle herds are watered only every third day and travel five to eight miles each way between water and forage as a general practice during a typical dry season. They may travel up to $9\frac{1}{2}$ miles to 10 miles maximum between feed and water for short-duration stress periods. Instances of cattle herds of a thousand head or more walking for five continuous days without water, in moving from a dried water hole to the Tana River, are uncommon in the typical dry season.

From a situation of a forage supply without water, it then becomes another difficult situation for the livestock operator of finally having available water, but with little or no forage for his cattle within walking distance of the permanent water, because of the deteriorated range condition.

(h) The Trend

These grossly inadequate permanent water supplies permit only very inefficient and damaging range use. With the programs of disease and tick control, cattle buying and water development that are being extended into the area, continuing damage is occurring to more acreage of range adjacent to permanent water points recently developed. At the same time the great majority of the area, in the absence of water supplies correlated with range management planning, is still greatly under-utilized.

(i) Need for Planned Water Development and Management for Stabilized Livestock Production

Most of the stock water ponds, both natural and those constructed so far, still go dry shortly after seasonal rains stop. Those which have been successful in holding water for the longest periods through the dry seasons, are those which are the deepest and situated on strong water courses so as to more effectively trap and deliver water quickly and hold it with a minimum of evaporation loss. Unfortunately, most of the reservoirs are subject to heavy siltation and require periodic cleaning by heavy equipment in order to restore them to their original capacities.

There is great need then for developing water points according to an overall plan that can be managed for stable forage production and which will provide a dependable source of livestock water when it is needed to meet the grazing schedule in the range management plan. The location of these water points should be within reasonable distance to areas producing suitable livestock forage, and the water supply sufficient to maintain a cattle herd in balance with the forage supply, as far as practical. Nomad herdsmen tend to experience more difficulty in maintaining pumping and storage equipment at borehole water points, than they do at successful catchments. To that extent they tend to prefer reservoirs to boreholes, if the reservoir can provide the water when it is needed. Reservoirs can provide adequate water if properly engineered and constructed and the herdsmen maintain good water discipline.

There is also a need for temporary water storage facilities on areas to be designated "wet season grazing areas" in the management plans so as to extend the period of grazing for a reasonable time in these areas, beyond the date when the rain stops.

2. The Livestock Producers of Northeast Province

(a) Background Information

A study, sponsored by the Government of Kenya, of the present social structure, relationship and outlook of the people presently producing livestock in Northeast Province was made in August-September, 1969, by Dr. Robert J. Chambers. His observations made during visits with the livestock operators

in the Province are covered in an unpublished report from which considerable information was utilized for this report.

(b) Basis of Livelihood

Livestock use is characterized principally by little more than subsistence level economic patterns of long standing.

The basis of livelihood for people in Northeast Province, is grazing of cattle, camels, sheep and goats. Though the lot of the livestock operator has been, and is, very rugged, they have succeeded in living the best they can, within the climate, topography, soil, vegetation and weather and without the benefit of community-wide planned development and use of this substantial resource.

Cattle owners frequently own no camels, except for milk and pack animals and few, if any, goats, sheep or donkeys. Camel owners rarely own cattle, but frequently own large numbers of sheep and goats. The ownership of sheep and goats as a primary animal is rare. These typical nomadic and semi-nomadic people tend to be good herdsman, and their system of stock raising characterizes land use in Northeast Province. It has evolved over centuries, under conditions over which they have had little or no control, other than to credit their very existence to their strong will, natural pride and "know how" in tending their livestock.

(c) Aptitude for Producing Livestock and Maintaining the Resources

The apparent intent of these livestock operators to perpetuate the range resources, if given a reasonable opportunity, is commonly documented by several indicators. For instance, the usual presence of a strip of fair to good condition forage plants, still growing up to the very edge of some key watering points (such as along certain sections of the Golana Gof), is the result of self-imposed restraints of grazing within the immediate proximity to permanent water sources which have been used annually for centuries. This is also an indicator and evidence that forage producing vegetation will respond successfully even under considerable grazing pressure, if a favorable situation is provided to the forage plants through grazing practice.

It is also an indicator of the very important natural capability and desire of all herders, to have complete control over the choice of area their livestock may graze at any time or place. This can only be considered a very valuable capability. It eliminates the need for control fences between management pastures, which is normally the one most expensive necessity of range improvement over so much of the managed dry land cattle ranges of especially North America. This is a distinct and tremendous advantage, in proper management of cattle on dry land ranges in semi-arid climates. This advantage

can be very much reflected in the directing of substantially higher proportions of available range development funds to developing stable livestock watering facilities to the fullest extent. The savings apparent by eliminating the need for costly management fences could go far in fully exploiting the water potential in Northeast Province.

General deterioration of the key livestock forage areas accessible from permanent water sources has occurred over long period of subsistence living. The primary task of the livestock operator up to now, has apparently been one of surviving through short-range planning alone, in competition for forage and water with others. Often fully aware of the situation, he is obliged to carry on without a community-wide long-range program. So far it seems there has been little or no opportunity to develop, use and stabilize the range resource, so as to provide its optimum, rather than minimum, benefits to the people.

The nomadic herdsman from Northeast Province often lacks formal education and money, but he does have the very important interest, attitude, aptitude and natural skill in many tasks necessary for successful livestock production.

(d) Promising Local Source of Range Managers

The first students to enroll in colleges in Kenya offering training in range management, who were also "raised" in the Northeast Province environment, have graduated, with formal qualifications for administrators of range management and have started to perform their role as range administrators in Northeast Province. They tend to be outstanding. A very important key to the successful implementation of this development project will be the unusual skills associated with the heritage of the nomadic livestock operators in Northeast Province.

3. Livestock in Northeast Province

(a) Livestock Census - Northeast Province

The Livestock Census prepared for the Kenya Ministry of Agriculture in 1969 reports the following for Northeast Province: ^{1/}

	<u>Districts</u>			
	<u>Garissa</u>	<u>Wajir</u>	<u>Mandera</u>	<u>Total</u>
Cattle	361,000	155,500	80,500	597,000
Camels	95,000	76,000	90,500	176,000
Sheep and Goats	74,000	74,500	143,000	291,000
Donkeys	2,000	500	160	2,600

^{1/} Northeast Province Livestock Census, 1969, Watson

The above estimates for cattle indicate an increase of 39%, 35%, and 38% respectively over the 1964 census for the three districts in the order listed. All other livestock showed a substantial decrease in all districts.

(b) Production

In a typical herd, maturity is apparently quite slow. Females tend to first calve later and males tend to require five to eight years to reach mature size. Production is relatively low, with calf losses (one year and less) averaging about 35 percent. ^{1/} The ratio of births to mature cows is 60 percent or less. The average annual available take-off is considerably less than is normally expected to be produced on developed, managed rangeland in similar climate and vegetative types.

(c) Low Cattle Production is Related to Range Development Needs

Low cattle production is believed to be caused primarily by inadequate water facilities, poor forage conditions near existing sources of water and low level nutrition during key growth and production periods. Moreover, it seems probable that lack of transportation facilities, uncertain markets and the shifta activity have been major delaying factors for motivating better cattle production.

4. Correlation with Other Uses

The grazing treatments prescribed are expected to increase forage plant vigor and density and soil mulch. This will improve the general health and composition of the range and tend to improve the habitat for cattle, people and wildlife.

The increased density of surface water reservoirs will tend to increase the area of yearlong habitat for some wildlife, including elephant, zebra and possibly other species.

^{1/} The following reference and discussion with others, tend to substantiate this. Northeast Province Livestock Census, Watson, 1969. Measurement of weights and size and herd composition of cattle in GOK-FAO Cooperative Project, Isiolo.

Emphasis should be directed to permit only structures on the range and especially at water points, which are designed to be subject to the very minimum disturbance of any species of wildlife. The use and value of wildlife will probably tend to increase and be more closely associated with livestock production in the future.

It is probable that use of forage by game will be a significant competitive factor in management of the grazing block if the prescribed grazing treatments by livestock which are designed to restore and maintain the range in good vigor, density and production, along with optimum stable cattle production, are accomplished by the livestock owners.

5. Ownership of Land

All land in the unit, beyond a short radius of villages already withdrawn from beef production is under jurisdiction of the Government of Kenya.

At the barazas attended by the team members, which were arranged by Dr. Chambers as a part of his study, it seemed apparent that the livestock owners were not interested in owning land except possibly for small shamba use in a few instances. Leaders and chiefs who were assumed to be speaking for the people urged community use of the rangelands.

B. Range Development

Surface reservoirs will be constructed at locations where the average distances between stored water and cattle forage will average 2-3 miles with a usual maximum of about 4 miles and the most, in the corners, about 5-6 miles.

1. Deep Reservoirs

Reservoirs designed to 30 feet depth, when practical, will be constructed in the pastures designated to be principally grazed during dry seasons. These deep reservoirs will be constructed to collect and store sufficient water through the preceding twelve to fifteen month-period, to normally provide adequate livestock water for the full cattle stocking scheduled for the pasture, during the season it is scheduled for use in the grazing treatment sequence. These reservoirs are planned to provide adequate water within a reasonable distance, of suitable quality and quantity forage, to provide up to about 150 days grazing, when necessary.

2. Temporary Reservoirs

Reservoirs located in the pastures designated to be principally managed for wet season grazing, are planned to be used as livestock watering points during and immediately following the rainy seasons. These reservoirs will be constructed for the purpose of storing sufficient water to normally

- 8 -

provide for the full cattle numbers scheduled for the designated pasture during the rainy season for six weeks or more following the rain. The purpose of this type of reservoir is to:

(a) extend the grazing period to make the fullest use of the green forage crop in the wet season pastures,

(b) minimize the length of period it will be necessary to provide livestock water in the pastures scheduled for dry season use, so as to accumulate and save maximum storage in the deep reservoirs for possible subsequent drought conditions whenever practical,

(c) provide time for forage plants to become fully made (deferred use to past "peak" of grass flowering) on pastures planned for dry season grazing to maintain full grass vigor, density and cattle production. These temporary reservoirs are designed for relatively small storage capacity for short duration only, and will be relatively shallow, usually 12 feet or less in depth.

C. The Range Management System

1. Grazing Treatments and Cattle Management

The heart of each management plan for each grazing block then, consists of accomplishing two simple steps:

Step 1

Graze cattle in the wet-season areas, scheduled for the first wet-dry season cycle just as soon after the rains start as there is enough green feed on these areas to carry the cattle. This is usually in the March-April period and the October-November period. Cattle are kept out of other parts of the grazing block during that wet season.

Step 2

When the cattle run short of water or feed in the wet-season grazing area, designated for grazing in the first wet-dry cycle, then move the cattle into the dry-season grazing areas, scheduled for the first wet-dry cycle, where there will be water and feed to last through the usual dry season. Cattle are kept out of areas designated for rest through the dry season. When the next wet season comes, repeat steps 1 and 2 as scheduled for the second wet-dry season cycle.

By making these two steps, the herder is helping to make a favorable situation for the range to produce more and better beef, on a stable program. From that point on, the herder can "let things happen" and forage conditions will tend to get better and better on the range.

Beyond these two steps, the responsibility of the livestock owner is to work with the water reservoir and dip custodians and the field representatives of his range committee and to take good care of his cattle. This latter will mean keeping the cattle in good grass, plenty of water, free from ticks, bad flies and disease, all with a minimum of disturbance, or walking. The goal of the herder in this regard will be to make the most weight gains with the fewest losses and cooperate in regularly accomplishing the two steps outlined above during each wet-dry season cycle.

2. Grazing Blocks Divided Into Pastures

In the sequence of grazing treatments scheduled for each of the designated "pastures" usually six of the seven or eight, or nine designated "pastures" are scheduled to be grazed some time during each wet-dry season cycle. On the average, three pastures are grazed during the wet season and three additional or more pastures are grazed during the dry season. Usually two pastures (one wet and one dry season pasture) are rested throughout each complete wet-dry cycle. Pasture boundaries are marked by a vehicle track.

The grazing formula prescribed for the range manager for each grazing block, is designed to produce optimum quality and quantity livestock on the specific range conditions, on each block. At the same time to stabilize the range resource, the grazing formula has a mandate to maintain good grasses where they occur now, as well as to restore trends on "poor" and "fair" condition ranges towards better production, through grazing treatment.

3. Sequence of Grazing on Wet Season (growing season) Pastures

A review of the grazing order which provides the sequence of grazing treatments for four consecutive wet-dry season cycles, as follows:

- 1st treatment: Grazing in wet season (growing season).
- 2nd treatment: Grazing in wet season (growing season).
- 3rd treatment: Deferred grazing "after peak of flowering" (dry season) or alternate with the 4th treatment.
- 4th treatment: Rest completely through wet-dry cycle or alternate with 3rd treatment.

In carrying out this grazing schedule through four complete wet-dry season cycles (a 2-year period) each wet season pasture is grazed during the growing season, for two consecutive years. This is followed by a treatment of deferment through the third growing season, thus grazing it in only the dry season after the "peak of flowering". This provides the opportunity for forage plants grazed during the wet seasons of the previous two cycles to

regain vigor and produce seed for the natural seeding process to be completed by the late grazing.

This deferment is followed in turn by the 4th treatment which is complete rest from grazing throughout the fourth and last wet-dry cycle of the sequence. This treatment permits the re-establishment of forage plant seedlings, together with soil mulching and aeration and permits further restoration of forage plant vigor.

By carrying out the above four treatments on the wet season pastures, optimum forage utilization and livestock production, to the full capability of the land to produce beef in sustained yield, is expected to be obtained. At the same time, this treatment is expected to maintain and improve the range resource through providing a favorable situation for upward trends.

4. Sequence of Grazing on Dry Season Pastures

A similar review of the scheduled grazing order for the dry season pastures is as follows:

- 1st treatment: Grazing in wet season (growing season)
- 2nd treatment: Deferred grazing until after peak flowering (dry season grazing).
- 3rd treatment: Rest completely through wet-dry cycle
- 4th treatment: Deferred grazing until after peak of flowering (dry season grazing).

In the first treatment of the sequence for grazing dry season pastures, each of the dry season pastures in turn is scheduled to be grazed during the wet season (growing season) of the first wet-dry cycle. This is planned in order to utilize this substantial crop of available forage, while it is green and most nutritious for good beef production gain. This is considered good business here, because it can be done in this sequence while other pastures are available by the plan, to carry the livestock through the dry season to follow. This same pasture in the second treatment is not grazed until the dry season of the second wet-dry cycle. This will permit the forage plants grazed during the first treatment to regain vigor, full root production and food storage, prior to the grazing during the dry season. This deferment also will permit opportunity for, and assist natural seeding and provide more time for reservoirs to fill for dry season water needs.

Complete rest is provided this pasture in the third treatment, through the entire wet-dry cycle. This makes a favorable situation for seeding establishment a full wet-dry cycle period for re-charging the reservoirs.

This is followed in the fourth treatment by deferred grazing again for protecting seedling from pulling and maintaining favorable conditions for restoring plant vigor and for additional water storage.

5. Treatment Order to be Repeated as a Common Practice

The treatment will be repeated every two years except for minor modifications that may be introduced to utilize on-the-ground opportunities noted and applied by the range manager in continuing evaluations. It is anticipated that he will try to observe the rule that range management plans should be modified if there is a very good reason but they will usually lose most of their benefit if modified without a very good reason.

From a study of rainfall records, runoff tables and other known factors, it has been estimated that within the average ten-year period, there is likely to be drought conditions extending across the equivalent period approximately two years. During such drought periods the reservoirs may not fill completely, nor provide the full volume of water specified for the regular grazing schedule.

It is important, therefore to set up and maintain alternatives to the regular grazing schedules to make additional water supplies available to meet emergency needs brought about by expected periodic, prolonged droughts.

6. Herd Composition and Cattle Quality Response Expected From Planned Improvements and Management of the Range

The composition of a typical herd grazing on the improved and managed grazing unit, will be quite different from the herds grazing the area today.

(a) Average cattle will mature at four years and more heifers will calve as three-year olds. The average gain on cattle will be greater and cattle will weigh more at the same age. The average age of steers sold will be lower. It is anticipated that there will be a continuing demand for immatures (1, 2 and 3-year olds). There will also be a market for good larger cattle, especially as transportation facilities improve. There will be a tendency for ranchers who have good grass and water to hold cattle to older age classes. This, together with the existing backlog of over-aged cattle will mean that there will be a supply of some older steers for some time to come.

(b) Death losses of calves will be reduced from the present 35 percent to less than 10 percent.

(c) Death losses of animals other than calves will be reduced. The net result of these improvements toward producing more, larger and better quality cattle in a shorter period, on the same acreage will be apparent, by comparing the number and weights of cattle sold in 1960 and 1970 with expected take-off from a projected composite herd of Boran cattle.

Both, the increase in the numbers of the grazing herd as well as the increased number, size and quality of saleable cattle which may be produced in the same period, on the same acreage, on a more suitable schedule, are indicators of some of the obvious benefits to be realized through implementation of the range development project. In actual practice all of these benefits are not likely to take place over-night. They will more likely be realized within a period related to certain and various fragmented circumstances and at about the same rate as prescribed practices are phased into actual practice, on the ground. Take-off numbers are kept conservative to allow for such continuing loss items as lion kills and thefts, the elimination of which may not be entirely within the control of the range manager.

D. Administration of Grazing Block

Initially there will be a need for close Province-level coordination with certain leaders and livestock owners to develop common understanding of the range development project and to formulate and correlate action plans in the communities involved. Responsibilities for carrying out the range management project on the three separate grazing blocks can well be delegated to one grazing block manager on each, with one assistant and one clerk. Each block manager will need to be equipped with a travel vehicle and portable trailer house for residence, office and field quarters.

The estimated managerial field job load required to administer each grazing block will be outlined in the management plans to be prepared for each of the grazing blocks.

A suggested check list of tasks to be accomplished on time schedules by the grazing block managers and their staff is provided in each management plan, together with suggested recording forms for control records.

The owners of livestock that graze on each of the grazing blocks will comprise a cooperative organization that would meet at least biannually for briefing on grazing plans for the next wet-dry season cycle. Indicators are that this group will probably include fifty to a hundred owners on each grazing block. These livestock owners probably can best assist in the routine management matters of the range if not more than a dozen or so elected representatives of the owners will meet the Grazing Block Manager periodically.

This group then, which may be referred to as the Range Committee, can elect one or more individuals of their group who can make themselves available to accompany the grazing block Manager on regular trips to the range. In this way the committee will be currently represented in routine on the ground decisions made jointly with the Block Manager. The individual chosen to rep-

represent the Range Committee in the field is referred to here as the Range Representative.

About 130 field days of actual on-the-range field inspection and supervision time will be required annually on each of the grazing blocks by the managers and/or their assistants. An equal amount of time will be required for the range representatives of each Range Management Committee for each grazing block. The Range Representative is a key man and normally should be encouraged to accompany the manager on all field trips on a grazing block. In addition, a substantial amount of time, up to that available to the Block Managers and their assistants, will be required for arranging for and conducting group meetings and special training and show-me tours on the grazing blocks. It will be necessary to train and involve the livestock owners in current management planning and decisions. This will be vital for obtaining and maintaining fullest common understanding and solution of the usual circumstances needing current attention for good results on the range.

E. Administration of Construction and Maintenance of Range Improvement

Field administration of the engineering, construction and maintenance staff will be the responsibility of the Chief Agricultural Engineer in co-operation with the Range Officer on the project. All aspects of engineering involved in the survey, design, layout and supervision of construction and maintenance of surface water reservoirs shall be under the supervision of the Engineer, who shall have the authority to inspect all materials, equipment and workmanship entering into the work to furnish all instructions and information regarding design plans and specifications that may to him seem necessary and to point out to the construction and maintenance crews any disregard of any of the provisions of the design plans.

Plans and schedules for maintenance of improvements on a specific block will be planned jointly and correlated with the Grazing Block Manager, who with the Grazing Block Range Committee will provide recommendations annually for maintenance needs to be provided by the Government of Kenya crews.

April 1974

ANNEX VII

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NORTHEAST PROJECT

TABLE 1

SUMMARY OF RECURRENT AND CAPITAL COSTS
 (TABLES 2 THRU 4) FOUR - YEAR TOTALS (\$000's)

	<u>FOREIGN EXCHANGE</u>	<u>LOCAL COSTS</u> (Dollar Equivalent)	<u>TOTAL</u>
<u>Recurrent Costs</u>			
Water Department	9.4	493.1	502.5
Range Management	<u>57.9</u>	<u>606.9</u>	<u>664.8</u>
	67.3	1,100.0	1,167.3
<u>Capital Costs</u>			
Water Department	1,921.6	2,844.0	4,765.6
Range Management	180.1	377.3	557.4
Maintenance Equipment and Personnel	<u>514.8</u>	-	<u>514.8</u>
	2,616.5	3,221.3	5,837.8
Total Recurrent & Capital	2,683.8	4,321.3	7,005.1
Add 10% for physical contingencies			<u>700.5</u>
Grand Total for Northeast Project			7,705.6

April 07, 1974

TABLE 1A

SUMMARY OF AID AND GOK FINANCED COSTS 1/

	AID			LC
	<u>FX</u>	<u>LC</u>	<u>TOTAL</u>	
Water Department				
Recurrent	9.4	-	9.4	493.1
Capital	1,921.6	1,971.6	3,893.2	872.4
Range Management				
Recurrent	57.9	126.0	183.9	480.9
Capital	180.1	-	180.1	377.3
Maintenance Equipment and Personnel	<u>514.8</u>	<u>-</u>	<u>514.8</u>	<u>-</u>
	2,683.8	2,097.6	4,781.4	2,223.7
Add 10% Physical Cont	<u>268.4</u>	<u>209.7</u>	<u>478.1</u>	<u>222.4</u>
	2,952.2	2,307.3	5,259.5	2,446.1

1/ From Tables 2, 3 and 4.

NORTHEAST PROJECT

ANNEX VII

TABLE 2

WATER DEPARTMENT COSTS - FOUR YEAR TOTALS (\$000's)

	<u>Foreign Exchange</u>	<u>Local Cost (Dollar Equiv)</u>	<u>Total</u>
<u>Recurrent Costs</u>			
Salaries (ex-PASA)	-	199.2*	199.2
Headquarters Operations	-	82.9*	82.9
Maintenance			220.4
Tracks	9.4	31.0*	(40.4)
Boreholes	-	<u>180.0*</u>	<u>(180.0)</u>
Total Recurrent	9.4	493.1	502.5
<u>Capital Costs</u>			
Construction	-	-	-
Reservoirs	-	-	2,315.5
POL	-	1,220.1	(1,220.1)
Personnel	-	529.1*	(529.1)
Spares	531.3	-	(531.3)
Equipment	35.0	-	(35.0)
Tracks	-	-	208.0
POL	-	111.3	(111.3)
Personnel	-	48.3*	(48.3)
Spares	48.4	-	(48.4)
Boreholes	-	-	1,227.6
Drilling	-	488.4*	(488.4)
Equipment	343.2	343.2	(686.4)
Testing	-	52.8	(52.8)
Construction Equipment and Vehicles 1/	898.7	30.8 2/*	929.5
Wajir Workshop	-	20.0*	20.0
Procurement Services	<u>65.0</u>	-	<u>65.0</u>
Total Capital	1,921.6	2,844.0	4,765.6

* Connotes cost to be assumed by the Government of Kenya

** Costs to be split between the United States and the Government of Kenya (244.2 each)

1/ Includes 10 percent price escalation to date of purchase; other items include 8 percent per annum for inflation or an average of 16 percent over the 4-year construction period, except POL for which cost has been increased 100 percent in year one and nothing thereafter

2/ Living caravans (to be procured locally)

April 07, 1974

TABLE 3

RANGE MANAGEMENT COSTS - FOUR-YEAR TOTALS (\$000's)

	<u>FOREIGN EXCHANGE</u>	<u>LOCAL COST (Dollar Equiv)</u>	<u>TOTAL</u>
<u>RECURRENT COSTS</u>			
Salaries (ex PASA)	-	410.5*	410.5
Vehicles (ex drivers)	-	-	145.0
POL	-	101.5	(101.5)
Maintenance (spares)	43.5	-	(43.5)
Motor Bike - operations & maintenance	8.6	8.15	17.1
Aircraft Charter	-	16.0	16.0
Range Travel Teams	<u>5.8</u>	<u>70.4*</u>	<u>76.2</u>
Total Recurrent	57.9	606.9	664.8
<u>CAPITAL COSTS</u>			
Housing	-	376.3*	376.3*
Vehicles <u>1/</u>	107.8	-	107.8
Motor Bikes <u>1/</u>	16.5	-	16.5
Equipment <u>1/</u>	38.6	-	38.6
Range Trend Teams	<u>17.2</u>	<u>1.0*</u>	<u>18.2</u>
Total Capital	180.1	377.3	557.4

* Connotes costs to be assumed by GOK

1/ Includes 10 percent for price escalation to (all other items include 8 percent per annum for inflation or an average of 16 percent over the 4-year construction period.

April 07, 1974

TABLE 4

MAINTENANCE, EQUIPMENT AND PERSONNEL

FOUR - YEAR TOTALS (\$000's)

	<u>FOREIGN EXCHANGE</u>	<u>LOCAL COSTS</u>	<u>TOTAL</u>
Equipment <u>1/</u>	174.8	- -	174.8
Specialists <u>2/</u>	330.0	- -	330.0
Procurement Services	<u>10.0</u>	<u>- -</u>	<u>10.0</u>
	514.8	- -	514.8

1/ Includes 10 percent inflation to date of purchase

2/ Includes two master mechanics for six man-years, one logistics and accounting specialist for 3.5 man-years and one shop supervisor for 2.5 man-years for total of 12 man-years at average of \$27,500 per year.

April 07, 1974

TABLE 5

RANGE MANAGEMENT DIVISION EQUIPMENT

FOUR-YEAR TOTALS* (\$000's)

	<u>Quantity</u>	<u>Total Costs</u>
Vehicles		
2 ½-ton pickups	1	8.0
¼-ton 4 x 4 pickups	15	90.0
Motor Bikes	15	15.0
Water Tank Trailers	5	5.0
Camp Equipment	42	12.6
Survey Equipment	5	7.5
Radios	12	6.0
Miscellaneous Office Equipment	-	4.0
		<u>148.1</u>
Add 10% price escalation		14.8
		<u>162.9</u>

* Does not include equipment for Range Trend Study Teams (Table 6)

TABLE 6

RANGE TREND STUDY TEAMS (2)

FOUR-YEAR TOTALS 1/

	<u>FOREIGN EXCHANGE</u>	<u>LOCAL COSTS</u>	<u>TOTAL</u>
Recurrent Costs			
Salaries (4)	-	56,000*	56,000
Vehicle Operations and maintenance	5,760	13,440*	19,200
Printing	-	1,000*	1,000
	<u>5,760</u>	<u>70,440</u>	<u>76,200</u>
Capital Costs			
Vehicles (2)	13,200	-	13,200
Safari Gear (2 sets)	-	500	500
Cameras, Instruments, etc	2,000	-	2,000
Drafting Equipment	1,000	-	1,000
Radios (2)	1,000	-	1,000
Miscellaneous Supplies	-	500	500
	<u>17,200</u>	<u>1,000</u>	<u>18,200</u>
Add 10% Physical Contingencies			9,440
			<u>9,440</u>
			103,840

1/ Assumes GOS will take over costs in fifth year

* Connotes cost to be assumed by GOK

Northeast ProjectBasis for Selected Cost Assumptions

1. New Equipment for Construction of Reservoir and Tracks: The target objectives of the Phase II project were translated from completed reservoir in gallon capacity and miles of tracks to Dixey Unit and track construction production capability. Net available working time of equipment was estimated to be 0.50 based on a 2,000 hour year. This condition is believed to reflect the average work condition to be experienced during this Phase II project based on the situation during the Phase I project. On this basis it was determined that one additional Dixey Unit and one additional track unit would be needed to meet the construction objectives of years 1-4 of the project.

Unit construction costs (including POL, personnel and spares) for reservoirs are assumed to be as follows: large - \$24,900; medium - \$15,000; small - \$5,000. Cost of equipping large reservoirs is estimated to be \$3,500 each.

2. Maintenance Equipment and Facilities to Support Equipment Operations: The USAID/REDSO/Consultant review of maintenance support for existing equipment and new equipment procurement showed that a sub-standard condition existed at the construction site with regard to available facilities, tools and maintenance equipment support. Maintenance requirements were then established with the related inputs of facilities, tools and equipment. These requirements were costed to establish the minimal investment necessary to support project operations.

Spare parts costs were estimated on the basis of a percentage parts replacement of the residual value of the existing equipment and a percentage parts replacement of the estimated purchase cost of the new equipment spread over the four years of the life of the project.

3. Borehole Development: These costs include drilling, casing and well development and were compiled by the PASA ground water hydrologist from past reference data under the Phase I project and recent Water Department contract costs, all upgraded to estimated January 1974 prices. Unit costs are assumed as follows: drilling and equipping - \$27,500; equipping only - \$14,300; drilling only - \$13,200.
4. Pump, Storage Tanks, Gabion, and Reservoir Site Development: These costs were compiled by the PASA Field Engineer and Ground Water Hydrologist from past Water Department projects, upgraded to January 1974 prices.

5. Staff Housing: These costs were obtained from the Range Management Division, Ministry of Agriculture, from past projects and contract work.
6. Recurrent Operations: The recurrent operating costs were established from the Water Department budget year based on incurred operating costs during the Phase I project.
7. Equipment Procurement: It is planned to use the services of a U.S. based Procurement Agency for procurement of all AID financed equipment. It is anticipated that such services will be obtained by negotiations on a fee basis.
8. Technical Assistance: A total of twelve (12) man-years of TA would be provided during years one to four of the Project at an average cost of \$27,500 per man-year. Housing will be provided by the GOK.
9. Range Management Operations: Vehicles and equipment have been provided under the Project to support the operations of a staff of 15 Assistant Range Officers and 15 Range Assistants during the four-year construction period. In addition equipping of two range trend study teams is included.

Northeast Project Table I

Construction Schedule

<u>Year/Structure</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Total</u>
<u>Reservoirs</u>					
Large	7	12	13	13	45
Equip only	3	4	3	-	10
Medium	4	6	7	7	24
Small	26	44	45	45	160
<u>Boreholes</u>					
Drill & Equip	7	10	10	10	37
Equip only	3	4	4	-	11
Drill only					4
<u>Tracks</u>	500	750	750	600	2600

NORTHEAST PROJECT TABLE 2Water Structures by Block ^{1/}

<u>Block No.</u>	<u>Boreholes</u>		<u>Reservoirs</u>			
	<u>Drill & Equip</u>	<u>Equip Only</u>	<u>Large Equip Only</u>	<u>Medium</u>	<u>Small</u>	
1						
2						
3		2				
4	2	1	4	3	3	15
5	2	1		3	6	25
6	3	4	4		2	15
7	7		3			15
8	5	3	3			5
9	7		8		2	25
10	3		8		5	20
11	4		8		3	20
15	<u>4</u>		<u>7</u>		<u>3</u>	<u>20</u>
	37 ^{2/}	11	45	10	24	160

^{1/} Net of previously built structures except for those shown as Equip Only.

^{2/} Does not include allowance for 4 dry holes.

Table 3

ANNEX VIII
DETAILED COST ESTIMATE - AID PORTION KENYA LIVESTOCK

1. Construction Vehicles and Equipment

	<u>Cost</u>	<u>Qty.</u>	<u>Total</u>
A. Construction Equip.			
1) 621 Wheel Tractor Scraper	86,000	3	258,000
2) 824 Wheel Tractor Dozer	90,000	1	90,000
3) 120 Motor Grader Std.	38,000	2	76,000
4) 814 Wheel Tractor Angle Dozer	51,000	1	51,000
5) D-7 Tractor Bull-Dozer	69,000	1	69,000
			Subtotal
			544,000
B. Vehicles			
1) 3/4 Ton 4x4 Pick-Up	6,000	11	66,000
2) 1,500 Gal. Fuel Tanker	14,000	2	28,000
3) 4x4 Truck w/mech. body	14,000	3	42,000
4) 7 Ton 4x4 Flat-Bed Truck	14,000	4	56,000
5) 1,500 Gal. Water Tanker	12,000	2	24,000
6) 1,500 Fuel Tanker Trailer Mtd.	6,000	2	12,000
7) Truck Tractor w/winch & 5th Wheel 280 H.P.	32,000	1	32,000
8) Lowbed Trailer Tandem Axle	13,000	1	13,000
9) Living Caravan	7,000	4	28,000
			Subtotal
			301,000

2. Maintenance Equipment

	<u>Cost</u>	<u>Qty.</u>	<u>Total</u>
* 1) Truck Mtd. Lube Unit	16,000	3	48,000
* 2) Mobile Repair Shop Trailer Mtd.	38,000	2	76,000
3) Electric Generator 25 KW	7,000	1	7,000
4) Electric Hand Drills 1/4, 1/2, 3/4, w/drill	66.75	3	200
5) Blacksmith Set	800	1	800
6) Air Compressor, 85 CMF	1,500	1	1,500
7) Oxygen Acetylene Torch	250	1	250
8) Bench Grinder	200	1	200
9) Tyre Dismounter Manual Type	200	1	200
10) Tap & Die Set NF & NC	350	1	350
11) Electric Welding Machine, Acc. & Diesel Engine	3,200	1	3,200
12) Skid Mounted Lube Unit w/Fuel Tank	6,000	1	6,000
13) Hydraulic Jack (20 Ton)	125	1	125
14) Hydraulic Jack (10 Ton)	80	1	80
15) General Purpose Tool Kit	600	5	3,000
16) Master Mechanic's Took Kit	1,000	1	1,000
17) 50-Ton Hydraulic Puller Set, Gears	1,000	1	1,000
18) Electric Soldering Set	40	1	40
19) Battery Charger, 12-24 Volts	400	1	400
20) Battery Tester Set	80	1	80

To be assigned to construction units.

	<u>Cost</u>	<u>Qty.</u>	<u>Total</u>
21) Tube Patching Set w/Patches	40	1	40
22) A-Frame, 3 Ton Capacity	800	1	800
23) Vices Bench-Type, 6 & 8 Inch	60	2	120
24) Hand-Type Grease Gun	400	2	800
25) Chain Hoist, 3-Ton Capacity	500	1	500
26) Radio Transmitting Set	1,200	3	3,600
27) Abor Press	75	1	75
28) Die Rethread NF & NC Set	80	1	80
29) Oil Cans, 1 Quart	2	2	4
30) Rotary Hand Pump	15	2	30
31) Bench Grinder- 10" Wheel	200	1	200
32) Adjustable Wrench Set 6-20 Inch	200	1	200
33) Pipe Wrench 6-24 Inch	200	1	200
34) Pipe Cutter	40	1	40
35) Pipe Thread Set 3/8 to 1 Inch	220	1	220
36) Hydraulic Brake Bleeder Set	60	1	60
37) Tube Cutting & Flaming Set	20	1	20
38) Socket Set, One Inch Square Drive	400	1	400
39) Valve Grinder Set Manual Type	50	1	50
40) Pens, Keys, Bolts, Nuts, etc.	2,000	lot	<u>2,000</u>
	Subtotal		158,864

Table 4

NORTHEAST PROJECT
TABLE 4 - SPARE PARTS

ANNEX VIII

	<u>Value</u>	<u>Years</u>				<u>Amt Factor</u>
		1	2	3	4	
1. New Equipment (Est.)	\$1,000,000		5%	5%	10%	
			50,000	50,000	100,000	
2. Shop Tools (Est.)	250,000		2%	2%	2%	
			5,000	5,000	5,000	
3. Existing Equipment (Est.)	350,000	10%	10%	10%	15%	
3 yrs. old		35,000	35,00	35,00	52,000	
 Total	200,000					
	15,000					
	<u>122,000</u>					
	337,000					
	<u>35,000</u>					
	\$ 372,000.					

NORTHEAST PROJECT

TABLE 5

WATER DEPARTMENT EQUIPMENT

ANNEX VIII

No.	Item	Unit Price	Dixey 2		Track Unit 1		Dixey 3	Track Unit	Wajir Shop	Spare Parts	Total Quantities On Hand	New Procurement	Total Cost
			On Hand	New Purchase	On Hand	New Purchase	New Purchase	New Purchase		Man Nairobi			
1	Pick up, standard box body 3/4 ton 4 x 4	6,000	3	3	0	1	3	1	2	1	3	11	66,000
2	Truck Mtd. Lube Unit	16,000	0	1	0	0	1	1	0	0	0	3	48,000
3	Truck Mtd. Fuel Tanker 1500 gals.	14,000	0	1	0	0	1	1	0	0	0	2	28,000
4	Trucks with Mechanical body w/tools, 4 x 4	14,000	0	1	0	0	1	1	0	0	0	3	43,000
5	Truck flat bed, cargo 4 x 4 7 ton	14,000	3	1	0	1	1	1	0	0	3	4	56,000
6	Truck Mtd. water 1500 gallons	12,000	0	1	0	0	1	0	0	0	0	2	24,000
7	Trailer Mtd. fuel tank 1500 gallons	6,000	0	1	0	0	1	0	0	0	0	2	12,000
8	Truck Tractor, tandem axle w/winch and 5th wheel 280 H.P.	32,000	0	0	0	0	1	0	0	0	0	1	32,000
9	Lowbed trailer, tandem axle goose neck, 50T	13,000	0	0	0	0	1	0	0	0	0	1	13,000
*10	Mobil repair shop trailer Mtd.	38,000	0	1	0	0	1	0	0	0	0	2	76,000

Dixey 2 and Track Unit

ANNEX VIII

<u>No.</u>	<u>Item</u>	<u>Unit Price</u>	<u>On Hand</u>	<u>New Purchase</u>	<u>On Hand</u>	<u>New Purchase</u>	<u>Dixey 3 New Purchase</u>	<u>Track Unit New Purchase</u>	<u>Wajir Shop</u>	<u>Spare Parts Mar Nairobi</u>	<u>Total Quantities On Hand</u>	<u>New Procurement</u>	<u>Total Cost</u>
11	Wheel tractor scraper (621) 14/20 yd. 300 H.P.	86,000	0	0	0	0	3	0	0	0	0	3	258,000
12	Wheel tractor w/st. blade dozer/push cup 300 H.P. (824)	90,000	0	0	0	0	1	0	0	0	0	3/1	90,000
13	Wheel tractor/ Angle dozer w/push cup, 170 H.P. (814)	51,000	1	0	0	0	0	1	0	0	1	1	51,000
14	Motor grader/std type 125 H.P. (120)	38,000	2	0	1	0	1	1	0	0	3	2	76,000
15	Track type tractor w/st. blade, bulldozer w/push cup, rear mtd. 3 shank ripper, 170 H.P. (D-7)	69,000	1	0	0	0	1	0	0	0	1	1	69,000
16	D-6 Dozer, 150 H.P.	-	1	0	1	0	0	0	0	0	2	0	-
17	966 Wheel dozer	-	1	0	0	0	0	0	0	0	1	0	-
18	613 Scraper/8 yd.	-	3	0	0	0	0	0	0	0	3	0	-
19	627 Scraper 14/20 yd.	-	2	0	0	0	0	0	0	0	2	0	-

Dixey 2 and Track Unit

ANNEX VIII

<u>No.</u>	<u>Item</u>	<u>Unit Price</u>	<u>On Hand</u>	<u>New Purchase</u>	<u>On Hand</u>	<u>New Purchase</u>	<u>Dixey 3 New Purchase</u>	<u>Track Unit New Purchase</u>	<u>Wajir Shop</u>	<u>Spare Parts Man Nairobi</u>	<u>Total Quantities On Hand</u>	<u>New Procurement</u>	<u>Total Cost</u>
20	7 Ton lorries	-	2	0	0	0	0	0	0	0	2	0	-
21	Radio transmitter	1,200	2	0	0	0	1	1	0	0	2	2	2,400
<hr/>													
Sub-total												94,400	
10% Contingencies												9,440	
Total												1,038,840	
Use												\$1,100,000	

These items are included as maintenance equipment in Table 3

UNITED STATES GOVERNMENT

ANNEX IX

Memorandum

TO : Office of Capital Development/Africa Bureau

DATE: February 22, 1974

FROM : REDSO/EA

SUBJECT: Kenya Livestock Loan, Request for Proprietary
Procurement Waiver.

AID through REDSO/EA is currently in the process of designing a Capital Development Loan for the Government of Kenya (GOK) as a part of the Phase II Kenya Livestock Project. This Project is multi-donor financed of which IBRD/Canada/Sweden are the other major financing agencies along with AID.

The total project financing is estimated at U.S. \$52.0 million of which AID will finance the amount of U.S. \$10.5 million for providing:

- (a) equipment;
- (b) technical assistance; and
- (c) local currency financing.

The equipment portion, estimated at U.S. \$2.3 m, provides for the procurement of U.S. source and origin heavy construction equipment, vehicles, maintenance and shop tools, engineering equipment, spare parts, pumping equipment, and other miscellaneous equipment required for Livestock Range Development.

This Phase II project is a follow-on undertaking as an extension of a pilot Range Development Program started under a Phase I, IBRD/Swedish financed Program (1969-1973).

Under the Phase I Project the GOK purchase specific pieces of Caterpillar Construction equipment for excavation of Range Livestock watering ponds and construction of range track (low standard roads).

The nature of the location of the pilot project, some 400 km. from the Nairobi, supply center, with its extreme logistical supply problems, being in the remote N.E. area of Kenya, and the level of support, both spare part, service and equipment reliability, provided by the local Caterpillar agency in Kenya, resulted in the GOK purchasing 12 units of construction equipment of Caterpillar manufacture for the project. No other heavy equipment makes were utilized. This present equipment will now be used in the Phase II project.

The proposed Project (Phase II) requires the procurement of eight additional units of heavy construction equipment of the same type now being used.



The past experience under the Phase I work and the present circumstances for the Phase II, which now places the work site some 700-1000 km. from Nairobi and in a much more remote section of the N.E. area of Kenya, dictates that equipment standardization, compatibility, service ability and spare part availability should compliment the existing equipment on site to assure effective and efficient accomplishment of the project goals.

The Caterpillar equipment now being used (along with the new equipment) has proven service support and spare part availability. No other US manufacture of similar equipment presently provides the level of support as that now provided in Kenya by Caterpillar Co.

The remote location of the project (2 days driving from Nairobi) and the extreme logistical problems involved requires the standardization of spare parts to the maximum extent possible. Due to the nature of the work, requiring considerable movement from pond site to pond site, the mobility factor is uppermost. This reflects providing the minimal requirements for parts storage and support on site. Standardization of equipment will minimize this problem.

The ease of procurement of Cat. spares, both in Kenya and Regional Warehouses in Europe assure a short lead time on servicing Cat. equipment.

The total estimated procurement costs of the eight units of caterpillar equipment is \$0.5 m. This represents 23% of the estimated total equipment costs for the project being financed by the AID loan.

It is hereby recommended that a proprietary procurement waiver for the purchase of the designated 8 units of caterpillar construction equipment be approved by AID/W for the Kenya Livestock Project.

ANNEX X

THE AGRICULTURAL FINANCE CORPORATION

A. Organization and Procedures

1. Establishment

The Agricultural Finance Corporation (AFC) was originally established as a government-owned statutory corporation in 1963. Under the Agricultural Finance Corporation Act of 1969 the AFC was reconstituted with wider, additional powers and assumed all the liabilities of the former Corporation as well as those of the Land and Agricultural Bank. According to the act the "functions of the Corporation shall be to assist in the development of agriculture and agricultural industries by making loans to farmers, co-operative societies, incorporated group representatives, private companies, public bodies, local authorities and other persons engaging in agriculture or agricultural industries".

2. Structure

As a Statutory Board the AFC is responsible to the Office of the President, while its management is under a Board of Directors. The AFC Law provides for a Board consisting of not less than four and not more than six persons appointed by the Minister responsible for AFC (of whom at least two shall be appointed by reason of their knowledge of banking or financial matters) and the Permanent Secretaries of Finance and Agriculture (or their designees).^{1/} The present Chairman of the Board is the Permanent Secretary of the Ministry of Finance.

On day-to-day business the AFC is closely involved with the Ministry of Agriculture and major policy decisions always involve the Office of the President. Since the AFC is a Statutory Board it is not subject to the Companies or Banking Acts.

3. Personnel

The General Manager of the AFC, who is its chief executive but a non-voting participant in Board meetings, is appointed by the Board with the approval of the Minister. The current general manager is a Kenyan appointed in June 1973 after serving for a number of years as Deputy General Manager. The post of Deputy General Manager is currently vacant although the AFC is actively recruiting and hopes to fill the position by June 1974.

^{1/} See Attachment I for a list of current Board members, and Attachment II for the current AFC Organization Chart.

As of June, 1973 AFC had a total^{2/} staff of about 350 of whom approximately 75 percent were professionals.

Experts provided or supported through bilateral assistance currently number 13 including the Head of Loan Department, the Chief Accountant, the Head of the Computer Section, the Head of the Budget Section, the Deputy Head of the Computer Section, four Area Supervisors, a Computer Programmer, a Credit Specialist in the Ranch Section and the Head of a Branch Office. In addition, the Financial Controller and the Head of the Ranch Section are AFC employed expatriates. Bilateral assistance is also expected to provide an additional financial controller specializing in computer use. It is planned to completely Kenyanize the AFC staff by 1978.

4. Lending Terms and Interest Rates

The law establishing the AFC gives the Board of Directors, with the approval of the Minister of Finance, broad powers to establish interest rates and security requirements. The law restricts the maximum length of loan to 30 years or less.

Since January 1973 the AFC lending rate has been 8 percent on all new loans and also on amounts overdue after that date. The previous rate was 7.5 percent. This compares with commercial bank rates of 8-9 percent.

B. Resources, Operations and Demands

1. Resources

As of March 31, 1972 over Ksh. 222.56 million of the AFC's total assets of Ksh. 242.23 million were provided by government. Irredeemable or ownership capital amounted to Ksh. 124.92 million, of which Ksh. 80.10 million earned an interest obligation of five percent. The remainder of irredeemable capital was interest free. "Redeemable" or long-term debt capital as of March 31, 1972 amounted to Ksh. 97.64 million and included proceeds of loans to the Government from the World Bank's International Development Association (IDA) and other external sources on-lent to the AFC, mainly on 25 year terms.

At March 31, 1972 the General Reserve stood at Ksh. 5.08 million. This account has diminished in size over the past several years due to AFC's continuing operating losses. Deposits are not a major source of funds, amounting to only Ksh. 9.48 million. Approximately one-half of this sum was represented by land purchase deposits which consist of borrower's own payments of up to 40 percent for land purchases which are temporarily held by AFC pending completion of transfer formalities which generally require at least two months.

^{2/} Professionals defined as individuals having a skill.

2. Current Operations

AFC operates some credit schemes on an agency basis, and is the principal for others. The Guaranteed Minimum Return Scheme, pineapple development loans and loans to cotton growers and cotton cooperative societies are included in AFC's operations as an agent for other organizations which provide the funds for each of these schemes. Amounts advanced under these programs are not reflected in AFC's financial statements and are not further discussed in this analysis.

AFC is presently extending credit in the role of principal under several large-scale and several small-scale programs. The large-scale schemes include land purchase and development loans financed by the British Land Transfer Program and ranching loans funded by the World Bank Group, Sweden and West Germany. The small-scale schemes include smallholder development projects funded by the World Bank group and the West German Government and other programs which are funded by the AFC entirely with resources generated or made available locally. The small-scale programs generally provide funds for specific purposes in amounts up to Ksh. 10,000 while advances under the large-scale schemes are for larger amounts and often finance farm enterprises such as ranching, which are different from those typically promoted in small-scale schemes such as dairying and food and cash crop production.

During the most recent fiscal year for which complete data are available (April 1, 1971 - March 31, 1972), loans in the amount of Ksh. 46.5 million were made compared to Ksh. 39.4 million the previous year. Net loans outstanding at year end (gross loans minus provision for bad debts) amounted to Ksh. 200.55 million compared to Ksh. 193.07 million a year earlier. Net large scale loans outstanding (for land purchase, large scale farm development, ranching, etc.) amounted to Ksh. 178.03 million and gross small-scale farm loans outstanding amounted to Ksh. 22.52 million.

3. Financial Position

AFC's balance sheet as of March 31, 1972 (Table III) is summarized as follows:

		(K £)
<u>ASSETS</u>		
<u>Current</u>		
Cash and Bank Balance	363,754	
Other Current	248,761	
<u>Loans and Investments</u>		
Large scale	8,901,401	
Small scale	1,126,154	
Investments	1,162,394	
<u>Mixed Assets</u>	297,389	
<u>Other Assets</u>	<u>11,673</u>	
Total Assets	£ 12,111,526	
<u>LIABILITIES</u>		
<u>Current</u>		
Deposits		473,964
Loans unissued		-
Other		254,670
<u>Long Term</u>		
Loans		4,882,088
Total Liabilities		£ 5,610,722
<u>Capital and Equity</u>		
Capital		6,246,338
Reserves		<u>254,466</u>
Total Capital & Equity		6,500,804
Total Liabilities and Capital		£ 12,111,526

AFC's rate of current assets to current liabilities is 1.0:1.19 which is satisfactory. The rate of long-term debt and guarantees to equity is 0.75:1.0, which is well within the reasonable debt-equity ratio criteria utilized by AID of 3:1, and gives the AFC considerable ability to secure additional foreign capital.

4. Profitability

AFC's income statements for the past five years are contained in Table IV. As can be seen AFC income has been steadily rising. However operating losses continue to be incurred (Ksh. 673,500 in 1971/72) although the substantial write off of doubtful debts (Ksh. 2.8 million) may be exaggerating the losses. The January 1, 1973 increase in interest rates from 7½ to 8 percent should improve the income flow. Projections show that the AFC should move into a profit situation in 1976. Administrative costs and provisions for doubtful debts are expected not to exceed 3.5 percent of total portfolio, which is reasonable. Combined with the AFC's cost of funds, which is approximately 4 percent on a blended basis, there is a need for average interest rates to reach the 7.5-8.0 percent range. However, the fact that a sizeable proportion (30+%) of the present portfolio is long-term at a 6 percent rate means a continuing period of financial strain until the proportion declines and/or other interest rates are raised further. A review of interest rates is scheduled once the result of a credit survey financed under a previous IDA loan is completed.

5. Accounts and Audit

Since 1970/71 the AFC has increased its accounting capabilities through the introduction of new accounting machines. In the past year all the accounts have been brought up to date with current information on borrowers and repayments available to the branches in a timely manner. A computer is being utilized and once the programs are completely "debugged" additional data and analyses will be available.

Three advisors provided under bilateral assistance are working steadily on improving the AFC's use of computers. Additional Kenyan staff in this area are required and are being recruited.

Presently the accounts are audited by the Nairobi Office of Messrs. Cooper Brothers and Co. For the past four years the annual financial statements have received an unqualified opinion as to accuracy noting that Special Emergency Loan Assistance Funds are excluded.

6. Forecast of Future Operations

Projections prepared for the IDA Appraisal of the Second Livestock Development Project show that the AFC should begin to show a profit in 1976. Total agricultural loans are expected to increase to Ksh. 658 million in 1976, with a net income of Ksh. 4.23 million (see Table V for IDA's projections).

The projections assume that the provision for bad debts will continue to be 2 percent of large scale loans and 30 percent of small scale loans. However, with the improved accounting and control expected within AFC over the next few years it may be possible to develop a less arbitrary provision policy.

C. The Ranch Section

1. Organization and Responsibilities

The Ranch Section of the AFC was established in 1969 to handle AFC's credit responsibilities in the first Livestock Development Project Loan. The section is under the Loan Department but has direct access to the General Manager. The section maintains its own sets of accounts.

Responsibilities of the Section include:

1. Implementation of AFC policies as directed by the General Manager and the Head of the Loans Department.
2. Accommodation and implementation of the directives of the Project Coordinator within the framework of AFC's own policies and organization.
3. Liaison with other agencies involved in the project.
4. Ensuring conduct of the project within the terms of agreement between aid donors and the GOK.
5. Maintenance of proper on-lending procedures particularly by directing and training AFC officers in all project areas.
6. Ensuring that proper accounts and records are kept by clients, branch offices and head office.
7. Preparation of normal and special reports as required by the General Manager, the Project Coordinator and other interested parties.
8. Assistance in the formulation of project policy and the preparation of future projects as and when required to do so by the General Manager.

2. Personnel

The Ranch Section currently has a staff of thirteen. The Section is headed by a Kenyan-born expatriate with a degree in agriculture and local ranching experience. The Deputy Head of Section is a Kenyan citizen with a degree in agriculture and considerable AFC field experience. Other head office staff include a USAID/PASA credit specialist, two accountants, a records/accounts specialist and a secretary. The Manager of the AFC Branch Office at Athi River, a Kenyan-born expatriate with extensive livestock experience, is scheduled to become a member of Ranch Section Head Office staff by March 1, 1974 with full time responsibility for the group ranches (he is currently handling group ranches along with his Branch responsibilities).

Field staff consists of six ranch/technical field loan officers with recruitment for an additional officer underway. In addition, four Branch Managers or Assistant Branch Managers from appropriate Branch Offices have received two weeks of training in ranch finance in anticipation of their key role in the making of ranching loans.

The IERD/IDA Appraisal Report calls for the Ranch Section staff to include 14 Livestock/Credit officers, three accountants, three clerks and four secretaries, plus head office management when the project is fully underway.

3. Operating Procedures

To date, due to the small number of personnel in the Ranch Section, all activities have been performed on a closely coordinated basis. The Head of the Section is thoroughly informed on all loans and takes an active role in all facets of extending credit from loan application preparation to loan implementation to loan monitoring and collection. Because the Section maintains its own set of accounts, once a loan is approved by the AFC, in day-to-day operations a considerable degree of independence from the remainder of AFC has been possible.

The actual procedure for securing a loan from the Ranch Section is rather long and complex, involving several steps and requiring the input and approval of a number of GOK and AFC officials. Table VI outlines the procedure to be employed under this project. It is estimated that the process of application through approval will require a minimum of 3-4 months and in some cases will probably take much longer.

After approval, implementation and disbursement begin which, particularly if part of the loan is for ranch development, will require considerable time depending on the complexity of the development, and various other controlled and uncontrolled factors. A number of current loans have been approved for over two years with development not completed. The

AFC makes the funds available either through payment of vouchers and invoices or through deposits in the borrower's bank account, the utilization of which must be documented to AFC's satisfaction before additional deposits are made.

Evidence of the time required between the approval and loan disbursement is shown by the December 31, 1973 financial report on Phase I IDA funds which has loan approvals of almost Ksh. 61 million and loans not yet issued of approximately Ksh. 19 million.

4. Performance

Since the Section's establishment in 1969 through 9/30/73, over 110 loans totalling Ksh. 60.9 million have been approved. The peak year in approvals was CY-1972 when 45 loans for a total of over Ksh. 26.5 million were approved. The decline in CY-1973 to eight loans approved for slightly over Ksh. 9.0 million reflects the lack of available funds with the exhaustion of the funds provided under the First Livestock Development Project.

Over the period, group ranch loan approvals totaled 15 in number and approximately Ksh. 14.9 million in value. Ten loans to company ranches were approved in the amount of Ksh. 20.7. Individual loans valued at Ksh. 4.7 million were made to 45 individuals and 43 commercial loans for Ksh. 20.6 million were approved. Of the total of Ksh. 60.9 million, funds for development amounted to Ksh. 24.6 million and steer purchase/operating expense loans totaled Ksh. 36.3 million.

As of December 31, 1973 loans approved but not yet issued amounted to approximately Ksh. 19 million, down from Ksh. 34 million six months earlier, demonstrating continuing progress but also pointing up the heavy implementation load still facing the AFC. For example, of the 15 group ranches, only three are in full production with another 10 under various stages of development. The remaining two have yet to begin development. For the company ranches approximately 65 percent of approved loan amounts have been disbursed. For individual ranches 53 percent of approved amounts have been disbursed and for commercial loans 89 percent. Of total operating capital/steer purchase funds, 83 percent have been disbursed while only 47 percent of approved development amounts have been paid out.

The arrears position at March 31, 1973 amounted to Ksh. 2,702,331,115 comprised primarily of operating capital loans. As of December 31, 1973 arrears had been reduced to Ksh. 1,952,135; however, bank officials assert that the amount does not present an accurate picture because over Ksh. 1.0 million is owed by one ranch in quarantine (cannot market) and approximately Ksh. 190,000 is due from ranches currently suffering from the drought.

During the most recent fiscal year, income of the Ranch Section amounted to Ksh. 1,279,500 or more than double the previous year. The operating loss of the Ranch Section amounted to only Ksh. 56,040 down from Ksh. 524,800 the previous year. However, this is not a cash loss as the provision for doubtful debts was increased by over Ksh. 540,000.

5. Current and Future Demands

Current demands on the Ranch Section are at a lower than normal level because available funds have been committed. No new loans are being considered (a back log of applications is reported to exist). Consequently Ranch Section staff are primarily engaged in the monitoring of loans and the implementation of approved but not yet fully utilized loans.

For the future, projections by the Ranch Section indicate that in Year One of the Second Livestock Project (approximately CY-1975) Ksh. 36.9 million will be lent, giving an outstanding loan balance at year end of about Ksh. 90 million (36 million plus approximately 54 million from the First Project). New lending will rise to Ksh. 66 million in Year Two and to 76 million in Year Three before declining to 36 Million in Year Four and 10 million in Year Five. Amounts outstanding at the end of the fifth year are projected to be in excess of Ksh. 230 million and will probably be closer to Ksh. 270 million. At this point, unless new funds are available, the outstanding loan portfolio will begin to decline as repayment by AFC of Livestock Project Loan funds begins. However, due to probable disbursement and implementation lags it would appear that the peak periods of Ranch Section activity will continue beyond the fifth year. Based on the number of current borrowers and the projected new loans, approximately 290 loans will have outstanding balances at the end of Year Five of the project (1979).

D. Loan Considerations ^{3/}

1. Adequacy of Staff and Operating Procedures

The AFC appears to have adequate numbers of staff in most areas and is actively attempting to strengthen identified weak areas (accounting for example) through recruitment of additional qualified personnel. As in any large organization the quality of staff is very uneven but new personnel and operating procedures (training, preparation of job descriptions) being developed should allow a gradual upgrading and more effective utilization of higher quality staff. Certain specialities which the AFC will increasingly require, i.e., computer specialists, will undoubtedly be difficult to recruit due to the short supply in Kenya.

^{3/} The discussion in this Section will deal primarily with the Ranch Section and only as specially indicated with the overall AFC.

For the future, given the current staff and the on-going attempts at upgrading and making staff more effective combined with the AFC salary scales which allow the organization to successfully attract personnel, staffing should not be a growing problem. However, the precipitous departure of the existing expatriate experts or the departure of some of the key Kenyan staff could seriously and quickly affect AFC performance. A continuing review of AFC staffing seems warranted and needed to ensure effective AFC and Second Livestock Project operation.

The Ranch Section has a good core staff with a clear understanding of the requirements and problems of ranch lending. To date the Section has been able to discharge its responsibilities with perhaps no more problems and mistakes than could be expected from a new AFC section handling new types of loans. Procedures and modes of operation have been developed which seem reasonable and which should facilitate expanded operations.

Although the staff is being expanded and current management is confident that an increased work load can be handled, a note of concern still seems appropriate. While the loan funds from the First Livestock Project are fully committed, they are less than half disbursed. The Ranch Section historically has played a heavy role in the actual implementation of loan financed ranch development and livestock activities. Combining the great deal of work which remains in implementing the approved First Livestock Project Loans with the new demands on Ranch Section staff imposed by the larger Second Livestock Project could over-extend staff with resultant delays in loan approvals and project implementation. The Group Ranch Loans, which require the heaviest time input and which are scheduled for the greatest expansion, are the most likely to be affected.

In recognition of these potential problems, certain organizational changes have taken place within the Ranch Section creating a division of responsibilities for new loan development and implementation and monitoring of approved loans. In addition, responsibility for all group ranch aspects of the Second Livestock Project, including the training and support of Branch officers on the structure and administration of group ranches, will be assigned to one individual - a former branch manager who is thoroughly familiar with the group ranching concept.

2. Potential Implementation and Sub-Loan Problems

As indicated in the previous section, staff and operating procedures need to be periodically reviewed. However, any required changes can be implemented by the AFC. A potential problem outside

AFC's direct control but with major importance to the lending program is the performance of the Range Management and Water Departments of the Ministry of Agriculture. Range management and water development plans form an important part of all loan applications. For group ranches the Range Management Department provides a ranch manager during the initial years of the ranches operation.

It is currently reported that the Water Department is unable to prepare required water development plans for potential borrowers due to a lack of recurrent budget. Because the AFC has fully obligated its ranching funds there is not a present bottleneck but the implications are severe if the situation persists. The Project Coordination Unit is aware of this problem and is currently working with the Water Department to have additional funds targeted for range water development. It is also reported that the quality of the ranch managers provided by the Ministry of Agriculture is not always satisfactory. Admittedly the type of persons required may not be in abundant supply but every effort must be made to ensure that conscientious hard working staff able to master the intricacies of both ranch management and loan administration are obtained. Without them the burden of ranch management will fall on the AFC Ranch Section. AFC has already anticipated this to some extent in agreeing to add 14 livestock credit officers to its staff.

A second potential problem which may or may not assume importance is the ability and willingness of Kenyan firms to provide services required in a timely manner, i.e., contracted water development. To date the record is good and it is reported that the capability exists for the projected expansion in demand for services. However, presumably the most accessible and easily developed areas are the first ones done. In more remote areas contractors may be less willing to perform needed services unless higher prices are paid which in turn could reduce the economic viability of the sub-loans.

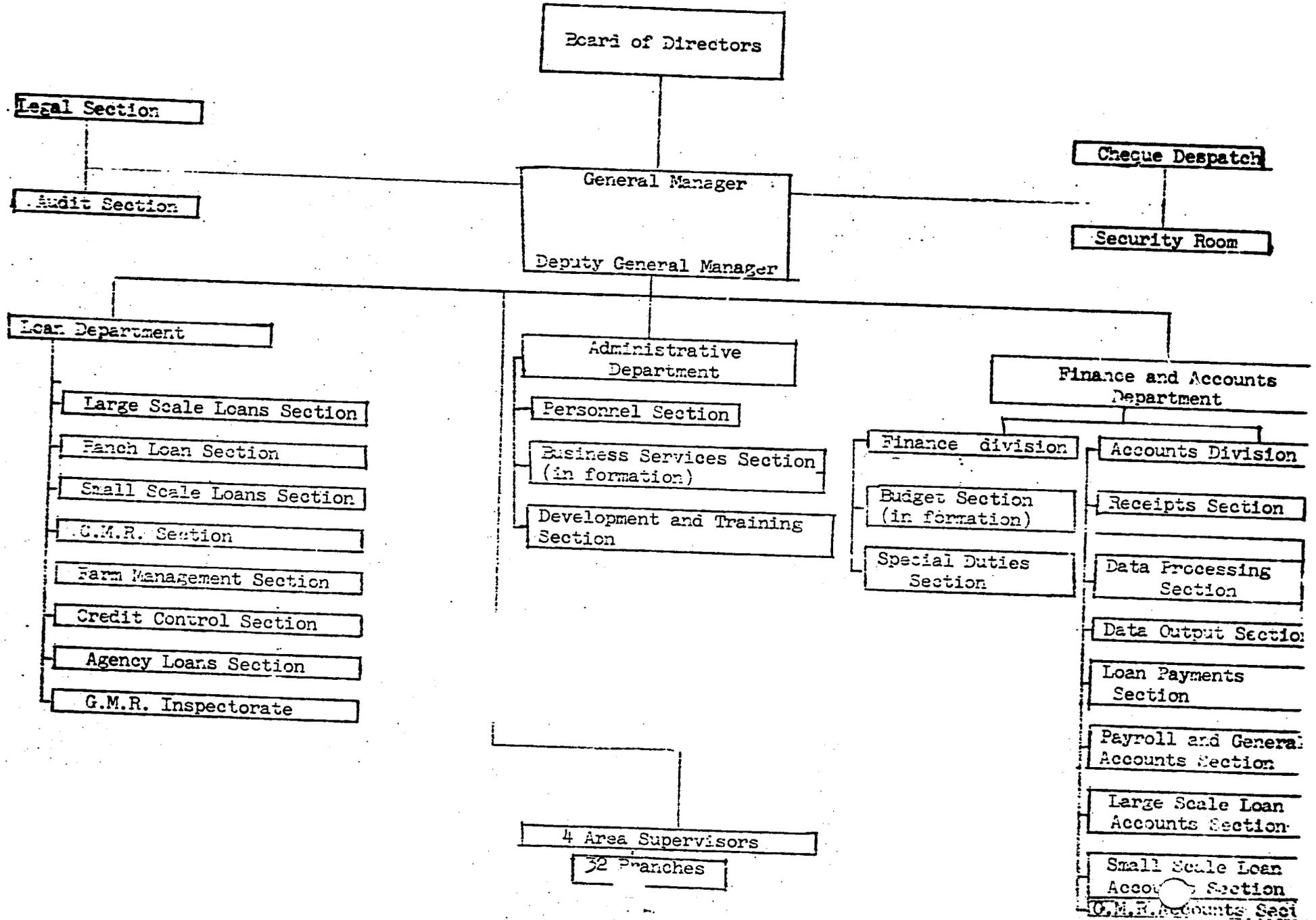
A third potential problem which will be partly under AFC control is loan repayment. For individual loans made to economically viable operations the problems should be minimal. For group, cooperative and company ranches, where the opportunity for the greatest social/economical impact on the largest numbers of people exists, the risks are high. Credit and loans are not familiar to many of the people who will comprise these organizations. Borrowing requires a re-orientation away from traditional attitudes toward cattle as well as a new type of discipline and cooperation. Installing this new outlook will require time and undoubtedly there will be difficulties and failures. To date, experience of the Ranch Section with these borrowers is not very good. A large number are slightly in arrears. However, the AFC is aware of the problem, is seeking innovative and replicable methods of dealing with groups and appears prepared to take reasonable steps to ensure repayment.

3. Conclusions

The Ranch Section is currently operating in a satisfactory manner utilizing appropriate procedures. Staff appear knowledgeable and well qualified. Suitable action is being taken to recruit additional staff to meet the expected increased work load resulting from the Second Livestock Project. Nevertheless, the rapid or unexpected departure of a very small number of key staff could quickly and seriously affect Section performance. Likewise, care needs to be taken to ensure that the demands of implementing already approved loans plus a large new loan program does not overwhelm Ranch Section staff with resultant poor performance.

Outside the AFC special attention must be given to the ability of cooperating Ministry of Agriculture departments to fulfill their responsibilities in a timely manner. This points up the need to ensure that the overall Livestock Project Coordination Unit effectively performs the key role it has been assigned.

ARC ORGANIZATION CHART



ATTACHMENT II

AGRICULTURAL FINANCE CORPORATIONBOARD OF DIRECTORS

Chairman	- Mr. D. Ndegwa	Permanent Secretary Ministry of Finance
Deputy Chairman	- Sir W. Havelock	Government Advisor/Farmer
Members	- Mr. J.G. Kibe	Permanent Secretary Ministry of Agriculture
	- Mr. Peter N. Sifuma	Farmer
	- Mr. William Bomett	Farmer
	- Mr. W.A.O. Ayoki	Business man
	- Mr. Simon Nyache	Provincial Commissioner, Central Province
	- Mr. J.K. Gatuguta	Member of Parliament Kikuyu Constituency

ATTACHMENT III

Procedure for Processing an AFC Ranch Loan ApplicationMajor ActivitiesSteps to be Taken

- | | |
|---------------------------------------|---|
| 1. Selection of ranches | <ul style="list-style-type: none"> a. Ranch name, location, etc. submitted to the Project Coordinator b. Given a priority by the Coordinating Committee |
| 2. Planning of ranches | <ul style="list-style-type: none"> a. Purchase of AFC loan application form b. AFC Branch Mgr. notifies AFC Ranch Section and the Project Coordinator c. Application is submitted to the Head of the Planning team in the district, the (D.R.O.) District Range Officer d. The following are to be consulted by the Team as indicated: <ul style="list-style-type: none"> AFC Branch Manager District Range Officer Ass't Registrar of Group Representatives District Cooperatives Officer District Wildlife Officer Technical Officer, Water Department District Veterinary Officer District Livestock Marketing Officer Others ----- e. Submitted to A.F.C. Branch Office with copies to Range Management Division, Water Department and the Project Coordinator f. Ranch projections made in AFC Branch Office |
| 3. Initial approval of loan | <ul style="list-style-type: none"> a. Submitted to the District Loans Advisory Committee by A.F.C. b. Submitted to Ranch Section, AFC c. Submitted to Project Coordinator/Committee for initial approval/disapproval |
| 4. Water design on Group type ranches | <ul style="list-style-type: none"> a. When approved above, water design work is carried out. b. Submitted to AFC Branch Office |

Major ActivitiesSteps to be Taken

- | | |
|---------------------------|---|
| 4 (cont.) | c. Discussed with ranch people on the ranch with all relevant officers present |
| 5. Final approval of loan | a. Submitted to Ranch Section, AFC
b. Project Coordinator given opportunity to review and make his recommendation
c. Submitted to the AFC Loans Committee
d. Submitted to AFC General Manager
e. Submitted to Board of Directors
f. Passed to Legal Department for preparation of necessary documents. |

- Notes: I. Activities No. 4 and No. 5 may proceed simultaneously if this is considered advantageous.
- II. Activity No. 4 will not be necessary on more commercially advanced ranches.

TABLE I

AGRICULTURAL FINANCE CORPORATION

FINANCIAL STATEMENTS

FY 1968/69-FY 72/73

(KE*)

	<u>1968/69</u>	<u>1969/70</u>	<u>1970/71</u>	<u>1971/72</u>
ASSETS				
<u>Current</u>				
Cash and				
Bank Balances	266,975	351,510	334,140	363,754
Other Current	120,210	172,523	142,790	248,761
<u>Loans and Investments</u>				
Large Scale	7,558,787	7,863,836	8,691,214	8,901,410
Small Scale	396,624	644,112	962,187	1,126,154
Investments	1,514,032	1,472,250	1,180,768	1,162,394
<u>Fixed Assets</u>				
	251,102	267,257	292,222	297,389
<u>Other Assets</u>				
	21,619	21,140	11,664	11,664
<u>Total</u>	<u>KE10,133,319</u>	<u>KE10,792,628</u>	<u>KE11,614,985</u>	<u>KE12,111,526</u>
LIABILITIES AND CAPITAL				
<u>Current</u>				
Deposits	188,787	413,255	209,422	473,964
Loans Unissued	258,669	303,538	686,996	-
Other	223,524	246,156	257,557	254,670
<u>Long Term</u>				
Loans	2,753,830	3,276,609	3,934,827	4,882,088
<u>Capital and Equity</u>				
Capital	6,206,139	6,210,557	6,238,039	6,246,338
Reserves	502,400	342,513	288,144	254,466
<u>Total</u>	<u>KE10,133,319</u>	<u>KE10,792,628</u>	<u>KE11,614,985</u>	<u>KE12,111,526</u>
Debt/Equity Ratio	0.4:1	0.5:1	0.6:1	0.75:1

* 1 KE = U.S. \$ 2.80

TABLE 2

AGRICULTURAL FINANCE CORPORATION

STATEMENTS OF PROFIT AND LOSS

(K£*)

FY 1968/69-1972/73

	<u>1968/69</u>	<u>1969/70</u>	<u>1970/71</u>	<u>1971/72</u>
<u>Income</u>				
Interest	772,244	634,476	656,496	783,914
Miscellaneous	97,561	100,789	121,489	147,552
Bad Debt Recovery	1,120	325		
Total	<u>K£ 870,925</u>	<u>K£ 735,590</u>	<u>K£ 777,985</u>	<u>K£ 931,466</u>
<u>Expenses</u>				
Interest	482,284	372,532	393,034	421,577
Administrative	306,027	269,048	287,778	367,112
Bad Debt Provision	186,993	113,835	118,207	140,183
Depreciation	22,474	14,008	21,616	33,342
Other	1,813	50,346	11,719	2,930
Total	<u>K£ 999,591</u>	<u>K£ 819,769</u>	<u>K£ 832,354</u>	<u>K£ 965,144</u>
Profit or (Loss)	(128,666)	(84,179)	(54,369)	

* 1 K£ = U.S. \$ 2.80

TABLE 3

KENYA

SECOND INTERROCK DEVELOPMENT FINANCEAFS Operational Statements - Cash Flow
Ken Shillings

	1971	1972	1971	1971	1972	1972
Net Income (Loss)	(0.9)	(1.3)	(2.1)	(1.3)	(0.35)	4.23
Plus:						
Depreciation	0.4	0.4	0.4	0.4	0.5	0.5
Provision for Doubtful Debts	2.4	2.5	2.7	4.3	5.0	6.2
Accounts Written-Off	-	-	-	-	-	-
Less:						
Uncollected Interest Receivable	2.1	2.0	2.4	2.9	3.3	3.7
Uncollected Agency Commissions	0.5	0.6	0.9	-	-	-
Profit on Sale of Assets	0.3	-	-	-	-	-
Funds Generated (Consumed) by Operations	<u>(1.0)</u>	<u>(1.0)</u>	<u>(1.3)</u>	<u>0.5</u>	<u>2.65</u>	<u>7.23</u>
Other Sources of Funds						
Liquidation of Investments	5.8	-	6.4	-	10.7	10.3
Disposal of Livestock and Properties	1.3	-	-	-	-	-
Increase in Capital Fund	0.6	-	-	-	-	-
Increase in Redeemable Capital	13.2	28.5	50.8	53.2	105.9	129.3
Increase in Deposit Liabilities	-	0.9	-	1.0	-	-
Increase in Other Liabilities	0.3	1.4	-	9.6	3.7	3.6
Decrease in Other Assets	-	-	-	0.3	-	-
Sub-total	<u>21.4</u>	<u>30.8</u>	<u>57.2</u>	<u>64.1</u>	<u>120.3</u>	<u>143.6</u>
Total Funds Available	<u>20.4</u>	<u>29.8</u>	<u>55.9</u>	<u>64.6</u>	<u>123.9</u>	<u>147.6</u>
Uses of Funds						
Increase in Total Loans - Net	22.9	19.2	52.1	70.0	145.9	115.9
Plus: Increase in Provision	2.3	2.6	2.7	4.3	5.0	6.2
Less: Uncollected Interest Receivable	2.1	2.0	2.4	2.9	3.3	3.7
Increase in Loans Disposed	7.6	21.6	2.1	10.2	28.7	13.6
Funds Loaned	<u>15.5</u>	<u>25.2</u>	<u>50.0</u>	<u>60.5</u>	<u>119.7</u>	<u>111.1</u>
Fixed Asset Expenditures (Net)	0.9	0.6	0.7	0.8	0.9	1.0
Increase in Investments	-	4.5	-	1.9	-	-
Liquidation of Livestock and Properties (Net)	-	-	-	-	-	-
Increase in Deposit Liabilities	4.1	-	1.0	-	-	-
Increase in Other Liabilities	-	-	3.7	-	-	-
Increase in Other Assets	-	0.1	1.4	-	-	0.2
Total Funds Used	<u>20.5</u>	<u>30.4</u>	<u>56.8</u>	<u>63.2</u>	<u>120.6</u>	<u>118.3</u>
Change in Cash and Bank Balances	<u>(0.1)</u>	<u>(0.6)</u>	<u>(0.9)</u>	<u>1.4</u>	<u>3.3</u>	<u>6.3</u>
Actual Cash in Hand and at Bank (at end of period)	<u>6.2</u>	<u>6.3</u>	<u>5.4</u>	<u>6.8</u>	<u>107.1</u>	<u>113.4</u>

May 8, 1973

SECOND LIVESTOCK DEVELOPMENT PROJECT

AFC Financial Statements - Income Statement
Ksh Million

TABLE 4

	<u>Actual</u> <u>3/31/71</u>	<u>3/31/72</u>	<u>3/31/73</u>	<u>Projected</u> <u>3/31/74</u>	<u>3/31/75</u>	<u>3/31/76</u>
Interest Receivable	13.13	14.23	17.18	22.1	31.27	39.77
Agency Commission Receivable	1.10	1.10	0.74	0.50	0.10	-
Other Operating Income	<u>1.00</u>	<u>1.20</u>	<u>1.24</u>	<u>1.28</u>	<u>1.32</u>	<u>1.36</u>
Profit on Sale of Assets	0.32	0.04	0.04	0.04	0.04	0.04
Bad Debts Recovered	-	<u>0.01</u>	<u>0.01</u>	<u>0.01</u>	<u>0.01</u>	<u>0.01</u>
Gross Income	<u>15.55</u>	<u>16.58</u>	<u>19.21</u>	<u>23.93</u>	<u>41.18</u>	<u>41.18</u>
Interest Paid ^{2/}	7.86	8.29	9.43	10.96	13.18	15.8
Staff and Board Expenses	4.66	(6.80)	(7.80)	9.5	13.6	14.4
Miscellaneous Operating Expenses	1.09	(((((
Depreciation	0.43	0.36	0.40	0.44	0.48	0.52
Provision for Doubtful Debts	2.35	2.46	2.72	4.34	5.83	6.23
Amounts Written off	-	-	-	-	-	-
Gross Expenses	<u>16.39</u>	<u>17.91</u>	<u>20.35</u>	<u>25.24</u>	<u>33.09</u>	<u>36.95</u>
Net Income (Loss)	(0.84)	(1.33)	(1.14)	(1.31)	(0.35)	4.23

1/ Interest etc on new loans calculated at 8% per annum

2/ IDA funds will be on-lent to AFC at a rate of 3% per annum.

ANNEX 4

KENYA

TABLE 5

SECOND LIVESTOCK DEVELOPMENT PROJECT

AFU Financial Statements - Liabilities and Assets
in Ksh Millions

LIABILITIES	Actual	Projected				
	3/31/73	3/31/73	3/31/73	3/31/74	3/31/75	3/31/76
Capital Funds (Irredeemable)	124.0	124.8	124.8	124.8	124.8	124.8
General Reserve	5.2	4.6	3.5	2.2	1.8	6.0
Sub-total	130.7	129.4	128.3	127.0	126.6	130.8
Redeemable Capital	70.7	107.2	158.0	211.2	318.3	447.4
Deposit Liabilities	4.2	5.1	4.1	5.1	5.1	5.1
Loans Unissued	13.7	38.3	40.7	51.6	80.3	80.7
Other Current Liabilities	5.2	6.6	2.9	12.3	15.9	12.5
Sub-total	23.1	50.0	47.7	69.0	101.3	115.3
Total Liabilities	232.5	286.6	334.0	407.2	526.0	661.5
Agricultural Loans						
Large Scale						
Not Yet Due	154.7	194.3	235.4	289.7	416.9	526.9
Arrears	24.0	28.7	33.8	42.9	55.7	68.6
Loans Provision	(14.9)	(5.0)	(5.4)	(6.3)	(8.2)	(10.1)
Sub-total	173.8	218.0	263.8	326.3	464.4	585.4
Small Scale						
Not Yet Due	19.8	25.3	32.1	41.1	50.7	55.7
Arrears	4.8	6.8	8.6	10.5	12.6	14.9
Loans Provision	(6.1)	(8.6)	(10.9)	(11.3)	(18.2)	(25.2)
Sub-total	18.5	23.5	29.8	37.3	45.1	45.0
Total Agricultural Loans	192.3	241.5	293.6	363.6	509.5	630.4
Investments	23.6	20.1	"	23.6	12.9	2.6
Cash and Bank Balances	6.2	6.3	5.4	6.8	10.1	18.4
Total Banking Assets	222.8	275.9	320.7	394.0	532.5	679.4
Fixed Assets (Net)	5.8	6.1	6.4	6.8	7.2	7.8
Farm Properties and Livestock	0.4	0.2	0.2	0.2	0.2	0.2
Agriculture Commission Fees	1.9	2.5	3.4	2.9	2.8	2.8
Other Assets	1.6	1.9	3.3	3.3	3.3	3.3
Total Assets	232.5	286.6	334.0	407.2	526.0	661.5

Source:

3/31/71
audited
statementProjections made by R. Campbell & J. M'pegani,
advisors to the Ministries of Finance and
Agriculture, respectively, in consultation
with AFU management.Projections
from 1971-72
M'pegani

r 8, 1973

Total Loan Amounts
For Cattle Purchase 1/ 2/

Total
(Millions)

<u>Group</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Years</u>	<u>Total</u>
1st 20	3,656,000	3,358,400	1,020,800	-	-	
2nd 20	-	3,656,000	3,548,400	1,020,800	-	
3rd 20	-	-	3,656,000	3,548,400	1,020,800	
	3,656,000	7,014,400	8,225,200	4,569,200	1,020,800	24,485,600
<u>Company</u>						
1st 7	3,771,600	751,520	1,218,000	-	-	
2nd 7	-	3,771,600	751,520	1,218,000	-	
3rd 7	-	-	3,771,600	751,520	1,218,000	
	3,771,600	4,523,120	5,741,120	1,969,520	1,218,000	17,223,360
<u>Commercial</u>						
1st 40	16,137,600	4,944,000	-	-	-	
2nd 30	-	12,103,200	3,708,000	-	-	
3rd 30	-	-	12,103,200	3,708,000	-	
	16,137,600	17,047,200	15,811,200	3,708,000	-	52,704,000
<u>Feed Lots</u>						
1st 1	1,008,800	1,112,640	-	-	-	
2nd 1	-	1,008,800	1,112,640	-	-	
3rd 1	-	-	1,008,800	1,112,640	-	
	1,008,800	2,121,440	2,121,440	1,112,640	-	6,364,320
Total						
w/o Feedlots	23,565,200	28,584,720	29,777,520	10,246,720	2,238,800	94,412,960
Total w Feedlots	24,574,000	30,706,160	31,898,960	11,359,360	2,238,800	100,777,280

1/ 80% of incremental cattle purchase requirements. Rancher investment represents 20 percent.
2/ Loans each of first three years to Group and Company Ranches and 2 years to Commercial Ranches and Feedlots

Dollar Loan ^{1/}

Amounts for Cattle

(in U.S. dollars)

<u>Type</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Years</u>	<u>Total</u>
Group	514,929	987,943	1,158,478	643,54	143,774	3,448,673
Company	531,211	637,059	808,608	277,39	171,549	2,425,824
Commercial	2,272,901	2,401,014	2,226,929	522,25	-	7,423,097
Sub Total	3,319,041	4,026,016	4,194,015	1,443,199	315,293	13,297,564
Feedlots	142,034	298,794	298,794	156,709	-	896,381
TOTAL	3,461,125	4,324,810	4,492,809	1,599,908	315,293	14,193,945

^{1/} Based on Table 6

Table 7

ANNEX X

Table 8

LEICA
SECOND LIVESTOCK DEVELOPMENT PROJECT
Herd Development Projection
Group Number
Initial - Group Purch - 16,000kg

Pre. Day.	1	2	3	4	5	6	7-20
HERD COMPOSITION							
Breeding Cows	1,132	1,377	1,674	1,801	1,801	1,801	1,801
Bulls	57	69	84	90	90	90	90
Heifers	510	623	695	1,083	1,171	1,171	1,171
9-24 Month Heifers	243	242	299	429	522	562	562
9-24 Month Steers	243	242	299	429	522	562	562
24-36 Month Heifers	231	231	116	0	0	0	0
24-36 Month Steers	231	231	233	287	412	502	510
36-48 Month Steers	220	110	0	0	0	0	0
48-60 Month Steers	101	0	0	0	0	0	0
Total Numbers	2,461	2,501	2,705	3,037	3,349	3,517	3,555
(Total Animals)	2,272	2,124	2,579	4,125	4,519	4,688	4,726
Sub-Total A.U.	2,461	2,501	2,705	3,037	3,349	3,517	3,555
Purchased Steers	0	165	295	163	206	38	0
Total Animal Units	2,461	2,666	3,000	3,200	3,555	3,555	3,555
MORTALITY							
Breeding Cows	57	57	55	67	72	72	72
Bulls	3	3	3	3	4	4	4
Heifers	0	26	25	36	44	47	47
9-24 Month Heifers	12	12	10	12	17	21	22
9-24 Month Steers	12	12	10	12	17	21	22
24-36 Month Heifers	12	12	9	5	0	0	0
24-36 Month Steers	12	12	9	9	11	16	22
36-48 Month Heifers	18	0	0	0	0	0	0
36-48 Month Steers	11	11	4	0	0	0	0
48-60 Month Steers	5	5	0	0	0	0	0
Sub-Total	136	150	115	144	165	181	189
Purchased Steers	0	0	7	12	7	8	0
Total	136	150	122	156	172	189	189
PURCHASES							
Breeding Age Heifers	-	200	200	53	0	0	0
Bulls	-	35	31	18	12	12	12
Sub-Total	-	235	231	71	12	12	12
Steers	-	165	295	163	206	38	0
Total	-	401	526	234	218	50	12
SALES							
Bulls	5	22	13	8	9	9	9
24-36 Month Heifers	0	0	0	0	12	14	52
36-48 Month Steers	105	110	222	223	275	396	518
48-60 Month Steers	99	209	105	0	0	0	0
60-72 Month Steers	0	99	0	0	0	0	0
Maturing Cull FEM	108	118	185	257	329	415	415
Sub-Total	317	558	525	488	625	834	994
Purchased Steers	0	0	158	264	156	158	37
Total	317	558	683	752	781	992	974
TECHNICAL COEFFICIENTS							
Weaning Rate %	50.00	55.00	65.00	65.00	65.00	65.00	65.00
Adult Mortality %	5.00	5.00	4.00	4.00	4.00	4.00	4.00
Extinction Rate %	12.88	22.29	19.12	16.08	18.10	23.30	25.46
Feb. Output Rate %	12.88	22.29	19.12	16.08	18.64	23.71	26.96
Cows/Total Herd %	32.10	44.07	46.52	43.66	39.03	39.43	38.12
Milk/Cow Ratio %	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Cow Culling Rate %	7.00	11.00	14.00	16.00	19.00	24.00	24.00
Bull Culling Rate %	0.00	40.00	20.00	10.00	10.00	10.00	10.00
Stocking Rate HA/A.U.	6.50	6.00	5.33	5.00	4.50	4.50	4.50
Stocking Rate A.U./HA	0.15	0.17	0.19	0.20	0.22	0.22	0.22
Carrying Cap. A.U.	2,461	2,666	3,000	3,200	3,555	3,555	3,555

TABLE 9

KEYSECOND LIFESPOK DEVELOPMENT PROJECT

Model - Camp Ranch - 16,000 ha

Investment Costs

1971-72

<u>Investment Category</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Year</u>			<u>Total Cost</u>	<u>Foreign Exchange \$</u>
			<u>1</u>	<u>2</u>	<u>3</u>		
<u>Water Facilities</u>							
Bores	2	60.0	40.0	40.0	40.0	120.0	50
Tank 20,000 gals	1	22.0	-	22.0	-	22.0	20
Tank 10,000 gals	2	11.0	-	11.0	11.0	22.0	20
Pipeline	7 km	12.0	-	42.0	42.0	84.0	80
Pump	1	6.0	-	6.0	-	6.0	90
Troughs	10	3.0	-	15.0	15.0	30.0	20
Sub-Total			40.0	136.0	108.0	284.0	
<u>Cattle Yards and Dips</u>	3	20.0	20.0	20.0	20.0	60.0	20
<u>Building</u>							
Office/store	3	4.0	4.0	4.0	4.0	12.0	20
Housing	4	10.0	20.0	10.0	10.0	40.0	20
Sub-Total			24.0	14.0	14.0	52.0	
<u>Equipment and Vehicles</u>							
Tractor and trailer	1	30.0	-	30.0	-	30.0	90
Motorcycle	1	7.0	7.0	-	-	7.0	90
Tools (not)	1	10.0	5.0	5.0	-	10.0	40
Sub-Total			12.0	35.0	-	47.0	
<u>Firebreaks and Roads</u>	100 km	.24	10.0	10.0	4.0	24.0	20
Breeding Stock ^{1/}			162.6	157.7	63.8	384.1	0
<u>Incremental Working capital^{2/}</u>			94.4	64.7	-	159.1	25
Total			363.0	437.4	209.8	1,010.2	

1/ For numbers see Annex X, Table 8

2/ Working capital is defined as 100% of steer purchase and 50% of operating costs. For steer purchase and operating costs, see Annex X Table 10.

	<u>Year</u>	<u>Year</u>
	<u>1</u>	<u>2</u>
100% Steer Purchase	65.9	118.1
50% Operating costs	37.9	50.4
	<u>103.8</u>	<u>168.5</u>
Less predevelopment Working Capital	<u>9.4</u>	<u>9.4</u>
	<u>94.4</u>	<u>159.1</u>
Incremental working capital	94.4	64.7

INDIA

WSTOCK DEVELOPMENT PROJECT

Sales and Operating Expenses Projections

Model - Group Ranch - 16,000 ha
Ksh

ITEM	Previous Yr.	Years						
		1	2	3	4	5	6	7-20
SALES								
Sale of Cull Cows	43,280	52,575	88,148	128,592	170,126	221,390	280,267	337,889
Hulls	3,000	13,605	8,530	5,403	6,653	6,488	6,917	6,917
Sub-total	46,280	66,180	96,777	133,992	176,777	227,734	285,184	344,806
TYPE OF STEERS								
Steers 26-36	0	0	0	0	7,012	8,633	31,473	31,473
Steers 36-48	52,300	58,154	128,537	142,883	192,793	277,078	337,613	382,571
Steers 48-60	59,400	135,850	68,468	0	0	0	0	0
Purchased Steers	0	0	0	0	0	0	0	0
Sub-total	111,900	194,004	297,005	313,015	293,590	404,613	390,373	394,044
Total Sales	158,180	260,184	388,645	447,007	469,707	632,402	675,577	677,990
OPERATING COSTS								
FIXED COSTS								
Salaries	0	6,200	10,400	40,400	40,400	40,400	40,400	40,400
Operating expenses	0	6,000	12,000	14,000	14,000	14,000	14,000	14,000
Repairs	0	7,000	13,000	18,000	18,000	18,000	18,000	18,000
Equipment	0	0	0	0	0	0	0	0
Office	0	500	2,000	2,000	2,000	2,000	2,000	2,000
Total	0	19,700	37,400	74,400	74,400	74,400	74,400	74,400
VARIABLE COSTS								
Dips ^{1/}	12,305	26,660	30,000	32,000	35,550	35,550	35,598	35,598
Vaccines ^{2/}	4,922	13,330	15,000	16,000	17,775	17,775	17,775	17,775
Beaufour ^{3/}	0	13,330	15,000	16,000	17,775	17,775	17,775	17,775
Selling Expenses ^{4/}	1,585	2,787	3,416	3,860	3,903	3,161	4,970	4,970
Total	18,812	56,107	63,416	67,860	75,003	76,261	76,070	76,070
Steer Purchases	0	65,876	118,145	65,087	107,084	39,710	24,498	24,498
Total Costs	18,812	141,684	218,962	207,347	256,487	190,371	236,968	174,978
INCOME	139,288	118,501	169,683	239,660	213,220	442,031	390,609	463,012

1/ Dipping costs have been estimated at Ksh 10 per animal unit.
 2/ Vaccines costs have been estimated at Ksh 5 per animal unit.
 3/ Beaufour costs have been estimated at Ksh 5 per animal unit.
 4/ Selling expenses are at Ksh 5 per head.

KENYA

SECOND LIVESTOCK DEVELOPMENT PROJECT

Model Group Ranch - 16,000 ha

Year	Incremental Cash Flow									
	1	2	3	4	5	6	7	8	9	10
Source of Funds										
Sales	102.1	230.5	208.9	311.6	474.3	467.5	479.9	479.9	479.9	479.9
Long-term loans	250.4	349.9	167.8	-	-	-	-	-	-	-
Ranchers' Investment ^{1/}	72.6	87.5	42.0	-	-	-	-	-	-	-
Total Sources	465.1	667.9	498.7	311.6	474.3	467.5	479.9	479.9	479.9	479.9
Use of Funds										
Operating Costs	122.8	200.1	188.4	237.6	171.5	213.1	156.1	156.1	156.1	156.1
Fixed Investment	105.0	215.0	146.0	-	-	-	-	-	-	-
Breeding Stock	162.6	157.7	63.8	-	-	-	-	-	-	-
Loan Interest ^{2/}	23.2	51.2	64.6	-	-	-	-	-	-	-
Loan Amenity ^{3/}	-	-	-	155.2	155.2	155.2	155.2	155.2	155.2	155.2
Total Uses	414.6	624.0	452.8	392.8	326.7	371.3	311.3	311.3	311.3	311.3
Annual Cash Surplus/										
(deficit)^{4/}	50.5	43.9	25.9	(81.2)	147.6	96.2	168.6	168.6	168.6	168.6
Cumulative Cash Surplus/										
(deficit)	50.5	94.4	120.3	39.1	186.7	282.9	451.5	620.1	788.7	957.3

^{1/} Being 20% of investment cost Annex X, Table 9.

^{2/} Interest at 8% per annum on outstanding balance of loan.

^{3/} Amenity for 7 years at 8% after 3 years.

^{4/} Group ranches will also have pre-development profits of Ksh 139,000 available for distribution to members.

April 4, 1973

Table 11

ANNEX X

LEBIA
ANIMAL DEVELOPMENT PROJECT

herd expansion program

Model - Company Ranch - 20,000 ha

Table 12

End of Year

YEAR	Previous Year	Years											
		1	2	3	4	5	6	7	8	9	10	11	12-18
HERD COMPOSITION													
Breeding Cows	500	824	1,387	1,143	1,173	1,270	1,318	1,391	1,478	1,480	1,480	1,480	1,480
Bulls	25	41	43	39	39	42	43	44	49	49	49	49	49
Heifers	250	230	483	676	743	822	883	923	974	1,035	1,038	1,036	1,036
0-24 Month Heifers	118	119	120	218	324	357	393	427	443	467	497	497	497
24-36 Month Heifers	118	119	120	318	324	357	393	427	443	467	497	497	497
36-48 Month Heifers	104	112	97	0	0	0	0	0	0	0	0	0	0
48-60 Month Heifers	104	112	114	113	809	312	342	379	410	423	449	477	477
60-72 Month Heifers	98	0	0	0	0	0	0	0	0	0	0	0	0
72-84 Month Heifers	98	49	0	0	0	0	0	0	0	0	0	0	0
84-96 Month Heifers	22	0	0	0	0	0	0	0	0	0	0	0	0
Total Numbers (Total Animals)	1,187	1,374	1,583	1,733	2,071	2,337	2,493	2,659	2,827	2,828	2,970	3,000	3,000
Sub-total A.U.	1,187	1,374	1,583	1,733	2,071	2,337	2,493	2,659	2,827	2,828	2,970	3,000	3,000
Purchased Steers	0	224	217	727	219	653	507	311	179	112	2	0	0
Total Animal Units	1,187	1,600	1,800	2,500	3,000	3,000	3,000	3,000	3,000	3,000	2,970	3,000	3,000
MORTALITY													
Breeding Cows	23	23	33	43	46	47	51	53	56	59	59	59	59
Bulls	2	1	2	2	2	2	2	2	2	2	2	2	2
Heifers	0	13	10	18	27	30	33	36	37	39	41	41	41
0-24 Month Heifers	6	6	3	3	3	3	3	3	3	3	3	3	3
24-36 Month Heifers	3	3	3	3	3	3	3	3	3	3	3	3	3
36-48 Month Heifers	3	3	4	3	3	3	3	3	3	3	3	3	3
48-60 Month Heifers	3	3	0	0	0	0	0	0	0	0	0	0	0
60-72 Month Heifers	3	3	2	0	0	0	0	0	0	0	0	0	0
72-84 Month Heifers	3	0	0	0	0	0	0	0	0	0	0	0	0
84-96 Month Heifers	3	1	0	0	0	0	0	0	0	0	0	0	0
96-108 Month Heifers	1	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total Purchased Steers	70	72	62	82	98	113	126	137	144	152	157	160	161
Total	73	72	74	91	129	150	153	157	157	159	161	160	161
FEED													
Breeding Age Heifers	0	200	250	0	0	0	0	0	0	0	0	0	0
Bulls	8	20	2	0	3	8	7	8	9	7	7	7	7
Sub-total Steers	6	220	239	0	3	8	7	8	9	7	7	7	7
Total	6	444	476	767	934	471	314	339	187	119	7	7	7
SALES													
Bulls	3	2	4	4	4	4	4	4	4	5	5	5	5
14-36 Month Heifers	0	0	0	0	0	0	0	0	0	0	0	0	0
36-48 Month Heifers	98	49	108	109	111	201	299	329	364	393	403	431	438
48-60 Month Heifers	22	93	47	0	0	0	0	0	0	0	0	0	0
60-72 Month Heifers	0	21	0	0	0	0	0	0	0	0	0	0	0
72-84 Month Heifers	0	0	0	0	0	0	0	0	0	0	0	0	0
84-96 Month Heifers	0	0	0	0	0	0	0	0	0	0	0	0	0
96-108 Month Heifers	0	0	0	0	0	0	0	0	0	0	0	0	0
Accounting Cull Fem	60	63	72	108	132	162	245	253	257	254	254	254	254
Sub-total Purchased Steers	164	208	238	221	247	374	347	384	435	463	482	553	581
Total	183	208	433	430	984	1,263	1,183	1,072	933	934	909	853	681
REPRODUCTION DATA													
aning Rate %	30.00	30.00	33.00	40.00	43.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
Joint Mortality %	3.00	3.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
Attraction Rate %	15.39	15.13	13.04	12.81	11.88	13.98	21.94	21.93	22.31	23.60	23.46	23.72	24.28
etal Output Rate %	15.39	15.13	13.04	12.81	11.88	13.98	21.94	21.93	22.31	23.60	23.46	23.72	24.28
ew/Total Fem %	34.79	30.67	33.34	47.47	41.74	40.20	39.96	30.73	38.54	37.72	35.92	34.67	35.66
ull/Cow Ratio %	3.00	3.00	4.00	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
ew culling Rate %	9.00	9.00	10.00	10.00	12.00	15.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
ull Culling Rate %	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
ocking Rate %/A.U.	23.39	17.30	13.38	11.20	9.33	9.33	9.33	9.33	9.33	9.33	9.43	9.33	9.33
ocking Rate %/A.U./Mo	0.04	0.04	0.06	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
arrying Cap. A.U.	1,400	1,600	1,800	2,500	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000

KENYA
SMOOTH LIVESTOCK DEVELOPMENT PROJECT

Table 13

Model - German Friesian - 28,000 ha
Investment Costs
Ksh '000

<u>Investment Category</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Total Cost</u>	<u>Foreign Exchange \$</u>
<u>Water Facilities</u>							
Dors/km	2	60.0	40.0	40.0	40.0	120.0	50
Tank, 20,000 gals	1	22.0	-	22.0	-	22.0	20
Tank, 10,000 gals	2	11.0	-	11.0	11.0	22.0	20
Piping	10 km	12.0	-	60.0	60.0	120.0	80
Pump	1	6.0	-	6.0	-	6.0	90
Frouths	10	3.0	-	15.0	15.0	30.0	20
Sub-total			40.0	124.0	126.0	320.0	
<u>Cattle Yards and Dips</u>							
	2	20.0	20.0	20.0	-	40.0	20
<u>Buildings</u>							
Offices/store	3	4.0	4.0	4.0	4.0	12.0	20
housing	4	10.0	20.0	10.0	10.0	40.0	20
Sub-total			24.0	14.0	14.0	52.0	
<u>Equipment and Vehicles</u>							
Tractor and trailer	1	30.0	-	30.0	-	30.0	90
Motorcycle	1	7.0	7.0	-	-	7.0	90
Tools (est)	1	10.0	5.0	5.0	-	10.0	40
Sub-total			12.0	35.0	-	47.0	
<u>Firebreak and Roads</u>							
	100 km	24	10.0	10.0	4.0	24.0	20
<u>Breeding stock^{1/}</u>							
			584.1	134.2	-	718.3	0
<u>Incremental Working Capital^{2/}</u>							
			121.2	21.6	318.0	460.8	25
Total			811.3	388.8	462.0	1,662.1	

^{1/} For numbers see Annex X, Table 12

^{2/} Working capital is defined as 100% of steer purchase and 50% of operating costs. For steer purchase and operating costs see Annex X, Table 14.

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
100% Steer purchase	89.4	86.9	306.9	379.1
50% Operating costs	31.8	55.9	75.3	81.7
	121.2	142.8	382.2	460.8
Incremental operating capital	121.2	21.6	318.0*	

* Years 3 & 4 incremental shown in year 3.

EXHIBIT

SECOND LIVESTOCK DEVELOPMENT PROJECT

Sales and Operating Expenses Projections

Maifal - Capacity Stock - 25,000 ha
Ksh

Year	1	2	3	4	5	6	7	8	9	10	11-20
SALES											
Sale of Cull Cow Bulls	19,000	37,713	54,081	68,700	90,224	134,126	144,515	169,256	179,273	179,451	179,451
Bulls	1,492	2,571	3,707	2,617	2,756	3,219	3,340	3,526	3,746	3,729	3,729
Sub-total	20,492	40,284	56,928	70,817	92,980	137,345	147,855	163,782	174,019	179,451	179,451
SALE OF SUPPLIES											
Heifers 24-36	0	0	0	0	0	0	0	0	0	0	0
Steers 36-48	26,182	62,417	70,042	77,414	140,362	209,331	230,135	254,649	48,394	63,268	86,098
Steers 48-60	60,515	30,826	0	0	0	0	0	0	275,315	285,675	381,158
Steers 60+	0	0	0	0	0	0	0	0	0	0	0
Purchased Steers	0	128,760	125,137	441,987	534,872	381,876	291,824	0	0	64,296	0
Sub-total	85,627	227,003	195,179	519,401	675,234	591,207	521,969	445,022	102,429	64,296	0
Total Sales	107,189	262,287	252,167	590,218	768,214	728,552	669,824	608,804	600,148	413,239	381,616
GENERAL COSTS											
FIXED COSTS											
Salaries	15,400	39,400	55,400	55,400	55,400	55,400	55,400	55,400	55,400	55,400	55,400
Operating expenses	6,000	12,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
Repairs	3,000	13,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Office	1,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Replacement	0	0	0	0	0	0	0	0	0	0	0
Rent	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200	7,200
Total	30,600	73,600	98,600	98,600	98,600	158,600	93,600	93,600	98,600	98,600	98,600
VARIABLE COSTS											
Dips 1/	16,000	18,000	25,000	30,000	30,000	30,000	30,000	30,000	30,000	29,704	29,995
Vaccine 2/	8,000	9,000	12,500	15,000	15,000	15,000	15,000	15,000	15,000	14,852	14,998
Non-flour 3/	8,000	9,000	12,500	15,000	15,000	15,000	15,000	15,000	15,000	14,852	14,998
Selling expenses 4/	1,043	2,764	2,152	4,913	6,324	5,917	5,362	4,763	4,666	4,547	4,265
Total	33,043	39,764	52,152	64,913	66,324	65,917	65,362	64,763	64,666	63,956	64,255
Stock Purchases	89,617	86,500	305,935	379,127	277,820	213,578	144,629	84,794	54,677	9,061	9,261
Total Costs	153,060	193,764	457,607	542,640	442,744	438,095	308,660	268,157	217,942	172,516	172,817
INCOME	(45,871)	63,524	(205,522)	47,577	325,471	290,457	361,163	360,647	322,205	414,924	383,020

1/ Dipping costs have been estimated at Ksh 10 per animal unit.
 2/ Vaccines costs have been estimated at Ksh 5 per animal unit.
 3/ Non-flour costs have been estimated at Ksh 5 per animal unit.
 4/ Selling expenses are at Ksh 5 per head.

Table 14

KENYA

SECOND LIVESTOCK DEVELOPMENT PROJECT

Model - Commercial ranch 28,000 ha

Incremental Cash Flow
Ksh '000

Year	1	2	3	4	5	6	7	8	9	10	11
<u>Source of Funds</u>											
Sales	107.2	262.3	252.2	590.2	768.2	728.6	649.8	608.8	608.1	587.4	587.4
Long-term loan	649.8	311.0	369.6	-	-	-	-	-	-	-	-
Rancher investment ^{1/}	162.3	77.8	92.4	-	-	-	-	-	-	-	-
Total Sources	918.5	651.1	714.2	590.2	768.2	728.6	669.8	608.8	608.1	587.4	587.4
<u>Use of Funds</u>											
Operating Costs	153.1	198.8	457.7	542.6	442.7	438.1	303.6	248.1	217.9	172.5	172.5
Fixed Investment	105.0	235.0	144.0	-	-	-	-	-	-	-	-
Breeding Stock	584.1	134.2	-	-	-	-	-	-	-	-	-
Loan Interest ^{2/}	51.9	76.8	106.4	-	-	-	-	-	-	-	-
Loan Amenity ^{3/}	-	-	-	255.4	255.4	255.4	255.4	255.4	255.4	255.4	-
Total Uses	895.1	642.8	708.1	758.0	698.1	693.5	564.0	503.5	473.3	427.9	172.5
Annual Cash Surplus/(Deficit)	23.4	8.3	6.1	(207.8)	70.1	35.1	105.8	105.3	126.8	159.5	414.9
Cumulative Cash Surplus/(Deficit)	23.4	31.7	37.1	(170.7)	(100.6)	(65.5)	40.3	145.6	272.4	431.9	846.8

- 1/ Rancher investment represents 20% of investment cost (Annex 6 Table 6)
 2/ Interest at 8% per annum on outstanding balance of loan.
 3/ Amenity for 7 years at 8%.

April 4, 1973

NRSA
SECOND LIVESTOCK DEVELOPMENT PROJECT

ANNEX X

Rural Development Projections
Commercial Ranches - 1,400 ha

Table 16

End of Year

END CONCENTION	Pre-Development	1	2	3	4	5	6	7
Breeding cows	600	633	616	605	605	605	605	605
Bulls	20	22	24	28	28	28	28	28
Whealers	210	260	300	387	424	424	424	424
9-24 Month Heifers	114	114	125	131	131	131	131	131
9-24 Month Steers	114	114	125	127	128	206	206	206
24-36 Month Heifers	109	108	45	0	0	0	0	0
24-36 Month Steers	109	58	109	121	122	102	199	199
36-48 Month Steers	124	0	0	0	0	0	0	0
Total Numbers (Total Animals)	970	859	916	992	1,054	1,112	1,129	1,129
Sub-Total A.U. Purchased Steers	970	859	916	992	1,054	1,112	1,129	1,129
Total Animal Units	970	859	1,133	1,133	1,133	1,133	1,129	1,129
MORTALITY								
Breeding cows	20	20	17	15	17	17	17	17
Bulls	1	1	1	1	1	1	1	1
Whealers	0	12	10	9	12	13	13	13
9-24 Month Heifers	6	6	5	4	4	4	4	4
9-24 Month Steers	6	6	5	4	4	4	4	4
24-36 Month Heifers	5	5	4	1	0	0	0	0
24-36 Month Steers	5	5	3	3	4	4	5	6
36-48 Month Heifers	5	5	0	0	0	0	0	0
36-48 Month Steers	5	5	0	0	0	0	0	0
48-60 Month Heifers	0	0	0	0	0	0	0	0
48-60 Month Steers	0	0	0	0	0	0	0	0
60-72 Month Steers	0	0	0	0	0	0	0	0
Wetting Cull FEM	0	0	0	0	0	0	0	0
Sub-Total Purchased Steers	71	60	45	37	44	45	46	47
Total	76	60	45	43	48	47	47	47
PURCHASES								
Breeding Age Heifers	0	25	25	0	0	0	0	0
Bulls	5	6	9	8	6	6	6	6
Sub-Total Steers	5	31	34	8	6	6	6	6
Total	5	31	221	149	85	27	6	6
SALES								
Bulls	4	4	4	5	5	5	5	5
9-24 Month Steers	0	0	0	16	57	75	75	75
9-24 Month Steers Loan	0	40	0	0	0	0	0	0
24-36 Month Heifers	0	0	10	0	0	0	0	0
24-36 Month Steers Loan	0	104	0	0	0	0	0	0
36-48 Month Steers	104	0	65	106	117	138	177	193
48-60 Month Steers	0	99	0	0	0	0	0	0
Fattening Cull FEM	100	71	0	100	110	110	110	110
Sub-Total Purchased Steers	208	323	162	227	289	328	357	383
Total	208	323	162	409	426	405	383	383
TECHNICAL COEFFICIENTS								
Weaning Rate %	60.00	65.00	70.00	75.00	75.00	75.00	75.00	75.00
Adult Mortality %	5.00	5.00	4.00	3.00	3.00	3.00	3.00	3.00
Extinction rate %	21.44	37.50	16.12	24.30	22.06	22.79	25.81	27.33
Sub. Output rate %	21.44	37.50	17.13	22.94	27.48	29.54	32.49	33.98
Cows/Total Herd %	33.03	38.67	43.32	40.99	38.24	35.61	35.00	36.40
Hull/Cow Ratio %	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Cow Culling Rate %	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Hull Culling Rate %	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Stocking Rate HA/A.U.	3.51	3.95	3.00	3.00	3.00	3.00	3.00	3.00
Stocking Rate A.U./HA	0.29	0.25	0.33	0.33	0.33	0.33	0.33	0.33
Carrying Cap. A.U.	850	850	1,133	1,133	1,133	1,133	1,133	1,133

ANNEX X

Table 17

HEMIASECOND LIVING AND DEVELOPMENT PROJECTModel - Commercial Ranch - 3,000 haInvestment Costs
1974-1980

<u>Investment Category</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Total Cost</u>	<u>Foreign Exchange</u>
<u>Water Facilities</u>						
Dams/Dam	1	60.0	30.0	30.0	60.0	50
Pump	1	6.0	-	6.0	6.0	90
Piping	5 km	12.0	-	60.0	60.0	80
Troughs	2	3.0	-	6.0	6.0	20
Tank, 10,000 gls	1	11.0	-	11.0	11.0	20
			30.0	113.0	143.0	
<u>Cattle Yard and Dip</u>						
	1	20.0	20.0	-	20.0	20
<u>Vehicles</u>						
Tractor and trailer	1	22.0	22.0	-	22.0	90
Pipeline and road	10 km	.5	5.0	-	5.0	20
Landings	10 km	1.5	7.5	7.5	15.0	10
Wagon servicing	50 ha	.2	1.0	1.0	2.0	
			65.5	121.5	207.0	
<u>Breeding Stock^{1/}</u>						
			504.3	32.9	537.2	0
<u>Incremental</u>						
Working Capital ^{2/}			40.0	128.3	168.3	25
Total			629.8	282.7	912.5	

1/ For number see Annex X, Table 16.

2/ Working capital is defined as 100% of steer purchase and 50% of operating costs:

	<u>Year 1</u>	<u>Year 2</u>
100% Steer purchase	-	121.6
50% Operating costs	40.0	45.7
	40.0	168.3
Incremental working capital	40.0	128.3

FINRA
SMOKE AUTOCLAVE DEVELOPMENT PROJECT
Sales and Operating Business Projections
Operational Periods - 2,400 hrs

Table 18

YEAR	1	2	3	4	5	6	7-78
SALES							
Sale of Cull Cows	48,000	54,600	67,200	74,550	74,550	74,550	74,550
Bulls	2,822	2,107	4,113	4,310	4,310	4,327	4,320
Sub-total	51,004	57,028	71,368	79,109	79,109	79,109	79,109
SALES OF BYPRODUCTS							
Heifers 9-24	0	0	3,782	39,569	37,023	37,023	37,023
Heifers 24-36	0	4,640	0	0	0	0	0
Steers 9-24	14,997	0	0	0	0	0	0
Steers 24-36	43,348	0	0	0	0	0	0
Steers 36-48	0	29,834	66,879	75,152	88,430	113,001	123,799
Steers 48-60	84,170	0	0	0	0	0	0
Purchased Steers	0	0	167,453	237,317	71,213	12,353	0
Sub-total	143,037	44,674	239,106	223,038	186,666	159,359	150,824
Total Sales	194,041	102,502	310,474	302,147	265,777	238,468	229,933
OPERATING COSTS							
FIXED COSTS							
Salaries	29,300	41,300	41,300	41,300	41,300	41,300	41,300
Operating expenses	12,000	14,300	14,300	14,500	14,300	14,200	14,300
Repairs	8,000	12,000	12,000	12,000	12,000	12,000	12,000
Office	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Depreciation	0	0	0	0	0	2,000	2,000
	61,300	69,600	69,600	69,800	69,600	69,600	69,600
VARIABLE COSTS							
Animal Health 1/	17,170	22,640	22,640	22,640	22,640	22,579	22,579
Selling Expenses 2/	1,812	310	7,032	3,133	2,023	1,521	1,218
	18,782	23,470	24,705	24,793	24,663	24,317	24,497
Stock Purchases	0	121,631	115,379	67,219	27,652	12,270	12,550
Total Costs	80,082	214,901	209,784	162,512	123,147	134,977	106,957
INCOME	<u>114,712</u>	<u>(112,399)</u>	<u>100,690</u>	<u>139,635</u>	<u>142,630</u>	<u>103,491</u>	<u>122,976</u>

1/ Animal health costs have been estimated at \$40 per animal unit.
 2/ Selling expenses are \$6 per head.

KENYA

SECOND LIVESTOCK DEVELOPMENT PROJECTModel - Commercial Ranch - 3,400 haIncremental Cash Flow
Ksh '000

Year	1	2	3	4	5	6	7	8	9	10	11
<u>Source of Funds</u>											
Sales	194.8	102.5	310.5	302.1	265.8	238.5	229.9	229.9	229.9	229.9	229.9
Long-term loan	503.8	226.2	-	-	-	-	-	-	-	-	-
Rancher Investment ^{1/}	126.0	56.5	-	-	-	-	-	-	-	-	-
Total Sources	824.6	385.2	310.5	302.1	265.8	238.5	229.9	229.9	229.9	229.9	229.9
<u>Use of Funds</u>											
Operating Costs	80.1	214.9	209.8	162.5	122.1	137.0	107.0	107.0	107.0	107.0	107.0
Fixed Investment	85.5	121.5	-	-	-	-	-	-	-	-	-
Working Stock	504.3	32.9	-	-	-	-	-	-	-	-	-
Loan Interest ^{2/}	60.3	58.4	58.4	-	-	-	-	-	-	-	-
Loan Amortity ^{3/}	-	-	-	140.2	140.2	140.2	140.2	140.2	140.2	140.2	140.2
Total Uses	710.2	427.7	268.2	302.7	262.3	277.2	247.2	247.2	247.2	247.2	247.2
Annual Cash Surplus/(Deficit)	114.4	(42.5)	42.3	(.6)	(3.5)	(38.7)	(17.3)	(17.3)	(17.3)	(17.3)	107.0
Accumulative Cash Surplus/(Deficit)	114.4	71.9	114.2	113.6	117.1	78.4	61.1	43.8	26.5	9.2	132.1

- ^{1/} Rancher investment represents 20% of investment cost (Annex X Table 17)
^{2/} Interest at 8% per annum on outstanding balance of loan.
^{3/} Amortity for 7 years at 8%.

April 4, 1973

GROUP RANCHING 1/1. Land Adjudication

Under Kenya's land adjudication program, tribal lands presently held in trust as "trust lands" by the County Councils are being converted through a survey and review process from common property into private property to be held by individuals or groups. All members of a tribe possessing traditional claims are able to own land. During the period 1970 - 1974, a total of about 5,105,000 hectares will have been adjudicated. This represents about 10 per cent of the total rangeland area of Kenya and includes 100 percent of the Masai districts of Narok and Kajiado (about 4,079,000 hectares).

The program is designed to maximize the economic potential of pastoral rangelands by bringing them into commercial production and to halt the rangeland deterioration now taking place under common property ownership. Accompanying the adjudication program is legislation which enables a group to organize into a corporate body possessing the legal powers to accept loans and conduct a business enterprise. The process of organization consists of electing a slate of group representatives (not less than three or more than ten), adopting a constitution and electing a group committee. The group committee is the functioning managerial body for the group and as such has responsibility for encouraging good technical and commercial practices, securing credit and managing funds for the benefit of members. The committee may also purchase or sell stock or other assets on behalf of members, may impose charges for services performed, and is the decision-making authority regarding the rights and obligations of any person in matters relating to use of group assets, including land.

Although land is held in common by all members of the group, certain property rights, such as residence rights are given to each member of the group while others such as the rights to water, grazing and tilling are retained by the group committee. Rights to sale of property can only be exercised by the group representatives with government approval.

1/ Source: "Some Issues in the Evolution Organization and Operation of Group Ranches in Kenya" by Robert K. David. Reprint No. 95, Land Tenure Center, University of Wisconsin.

Aside from the advantage of allocating land in economic units without creating a landless class, the group ranch undoubtedly provides a means for capturing economies of scale in the provision of water, purchase and sale of livestock and in grazing and health practices.

2. Economics for Allocating Grazing Quotas

Although the land has value for residence and tillage, its chief economic product is grazing. The group Committee will have two functions with regard to grazing rights. One will be to enforce the carrying capacities for the ranch which have been agreed upon in consultation with the District Range Officer. The second will be to set up a mechanism for allocating grazing rights to individual members of the group. To the extent the government is successful in getting the groups to accept and enforce limits on cattle numbers, it will have achieved a long standing aim of range management policy. Excessive numbers of cattle relative to carrying capacities of grazing areas is a problem created by traditional policies of having large individual herds. Added to this is the common property character of the rangeland which gave no individual an incentive to conserve on the use of the rangeland. Assigning individual rights to specific group ranch properties should give the group, but not the individual, an incentive to find the optimum conservation policy for its ranch land.

3. Precedents for Group Ranching

Group farming is found in sugar and cotton production in western Kenya where it has arisen spontaneously as a matter of self help. In the northern plains of the US grazing associations lease land which is placed under group management. The associations pay leasing charges, collect grazing fees and other assessments to cover expenses and distribute any profits among members.

The Israeli kwutzas and Tanzania's ujaama villages provide the best known examples of cooperative farming for comparison with group ranches. Pragmatic considerations of scale economies and financial advantages of bigness provide an economic rationale for these examples of cooperative farming. Group ranching, however, had developed without any of the ideological accompaniment of these more famous examples of cooperation and one may reasonably conclude a pragmatic rather ideological solution to the complex set of issues which have existed in Masailand for a long time.

NORTHEAST PROJECT

TABLE 1

ECONOMIC ANALYSIS

PROJECT COSTS BY YEAR (DOLLARS)

<u>Year</u>	<u>CAPITAL COSTS</u>		<u>DEVELOPMENT COSTS</u>		<u>RECURRENT COSTS</u>		<u>TOTAL COSTS</u>
	<u>Water</u>	<u>RMD</u>	<u>Water</u>		<u>Water</u>	<u>RMD</u>	
1	412,930	180,100	663,400		126,800	138,250	1,521,480
2	984,710	237,300	1,028,200		152,800	223,150	2,626,160
3	90,000	134,500	1,069,600		179,800	253,850	1,727,750
4	90,000	4,400	989,900		200,200	284,550	1,569,050
5	-	-	-		107,400	244,600	352,000
6	-	-	-		117,200	244,600	361,800
7	-	-	-		119,000	-	363,600
8	-	-	-		119,000	-	363,600
9	-	-	-		115,700	-	360,300
10	-	-	-		-	-	-
11	-	-	-		-	-	-
12	-	-	-		-	-	-
13	-	-	-		-	-	-
14	-	-	-		-	-	-
15	-	-	-		-	-	-
16	-	-	-		-	-	-
17	-	-	-		-	-	-
18	-	-	-		-	-	-
19	-	-	-		-	-	-
20	-	-	-		115,700	244,600	360,300

TABLE 2

ECONOMIC ANALYSIS

PROJECT BENEFITS BY YEAR (DOLLARS)

Year	Incremental Offtake ^{1/} (Head)	Value of Incremental Offtake ^{2/}	Salvage Values	Total Benefits
1	1,900	153,304	-	153,304
2	7,945	640,993	-	-
3	1,870	252,514	-	-
4	5,990	262,939	-	-
5	8,625	441,796	300,000	741,796
6	12,105	668,561	-	668,561
7	11,115	613,672	-	-
8	15,085	879,779	-	-
9	14,820	858,381	-	-
10	16,490	973,325	-	-
11	-	1,090,982	-	-
12	-	1,208,639	-	-
13	-	1,326,297	-	-
14	-	1,443,954	-	-
15	-	1,561,612	-	-
16	-	1,679,269	-	-
17	-	1,796,926	-	-
18	-	1,914,584	-	-
19	-	2,032,241	-	-
20	33,190	2,149,899	11,695,598	13,845,497

^{1/} Based on the Biological Herd Model prepared by Frank Ambercrombie, AID, using the following coefficients: calving rate increases from 60% to 70% by year 5; cull mortality decreases from 30% to 15%; heifer's first calf from 4 - 5 years to 3 - 4 years; replacement heifers 95%; replacement bulls 25%. These coefficients yield an average annual herd growth of 2% with offtake increasing from 11.5% before the project to 16% in year 20.

^{2/} Based on the following prices (K. Shgs per head): cull cows - 452; cull heifers 2-3 years - 427; cull heifers 3-4 years - 439; cull bulls - 599; steers 2-3 years 505; steers 3-4 years - 599; steers over 5 years - 665.

^{3/} Salvage values as follows: \$300,000 for equipment in year 5; \$2,328,570 for structures (reservoirs and boreholes); \$8,867,028 for incremental cattle (139,902 at K. Shgs 450 per head) at end of year 20.

INTERNAL RATE OF RETURN ANALYSIS

<u>YEAR</u>	<u>NET BENEFITS</u>	<u>NET COSTS</u>	<u>(- or -) DIFFERENCE</u>	<u>8% DISCOUNT FACTOR</u>	<u>DISCOUNTED DIFFERENCE</u>	<u>12% DISCOUNT FACTOR</u>	<u>DISCOUNTED DIFFERENCE</u>
1	- 153,304	1,521,480	- 1,674,784	.926	- 1,550,849	.693	- 1,495,582
2	+ 640,993	2,626,160	- 1,985,167	.857	- 1,701,288	.797	- 1,582,178
3	- 252,514	1,727,750	- 1,980,264	.794	- 1,572,529	.712	- 1,409,947
4	- 262,939	1,569,050	- 1,306,111	.735	- 959,991	.636	- 830,686
5	741,796	352,000	- 389,796	.681	+ 265,451	.561	+ 221,014
6	668,561	361,800	306,761	.630	193,259	.507	155,528
7	613,672	363,600	250,072	.584	146,042	.452	113,032
8	879,779	363,600	516,179	.540	278,236	.404	208,536
9	858,381	360,300	498,081	.500	249,040	.361	179,807
10	973,325	-	613,025	.463	283,830	.322	197,394
11	1,090,982	-	730,682	.429	313,462	.287	209,706
12	1,208,639	-	848,339	.397	336,790	.257	218,023
13	1,326,297	-	965,997	.368	355,486	.229	221,213
14	1,443,954	-	1,083,654	.341	369,526	.205	222,149
15	1,561,612	-	1,201,312	.315	378,413	.183	219,840
16	1,679,269	-	1,318,969	.292	385,138	.163	214,992
17	1,796,926	-	1,436,626	.270	387,889	.146	209,747
18	1,914,584	-	1,554,284	.250	388,571	.130	202,057
19	2,032,241	-	1,671,941	.232	387,890	.116	193,945
20	13,845,497	360,300	13,485,197	.215	2,899,317	.104	1,402,460
					+ 1,834,383		- 928,950

Net Spread: $1,834,383 + 928,950 = 2,763,283 \div 4$ (percentage points between 12% and 8%) = 690,833

Interpolation: $1,834,383 \div 690,833 = 2.66 - 8.0 = 10.66$ percent = IRR

April 10, 1974

TABLE 3a

SENSITIVITY ANALYSIS I

<u>Year</u>	<u>Net Benefits</u>	<u>Net Costs</u>	<u>(+ or -) Difference</u>	<u>8% Discount Factor</u>	<u>Discounted Difference</u>	<u>6% Discount Factor</u>	
1	-168,634	1,673,628	-1,842,262	.926	-1,705,935	.943	-1,737,253
2	+576,894	2,888,736	-2,311,882	.857	-1,981,283	.889	-2,055,263
3	-277,765	1,900,525	-2,178,290	.794	1,729,562	.839	-1,827,585
4	+236,645	1,725,955	-1,489,310	.735	-1,094,643	.729	-1,179,534
5	667,616	387,700	+ 280,416	.681	190,963	.747	+ 209,471
6	601,705	397,980	203,725	.630	128,347	.704	143,422
7	552,305	399,960	152,345	.584	88,969	.665	101,309
8	791,801	399,960	391,841	.540	211,594	.627	245,684
9	772,543	396,330	376,213	.500	188,107	.591	222,342
10	875,993	-	479,663	.463	222,084	.558	267,652
11	981,884	-	585,554	.429	251,203	.526	308,001
12	1,087,775	-	691,445	.397	274,504	.496	342,957
13	1,193,667	-	797,337	.368	293,420	.468	373,154
14	1,299,559	-	903,229	.341	308,001	.442	399,227
15	1,405,451	-	1,009,121	.315	317,873	.417	420,803
16	1,511,342	-	1,115,012	.292	325,584	.393	438,200
17	1,617,233	-	1,220,903	.270	329,644	.371	471,505
18	1,723,126	-	1,326,796	.250	331,699	.350	464,379
19	1,829,017	-	1,432,687	.232	332,383	.330	472,787
20	12,460,947	396,330	12,064,617	.215	<u>2,593,893</u>	.311	<u>3,751,096</u>
					<u>- 123,155</u>		<u>+ 1,833,454</u>

Costs increased 10 percent, Benefits decreased 10 percent.

Net Spread: $123,155 + 1,833,454 = 1,956,609 - 2$ (percentage points between 6% & 8%) = 978,304

Interpolation: $1,833,454 - 978,304 = 1.87$ I.C. = 7.89% = IRR

NORTHEAST PROJECT

TABLE 3b, SENSITIVITY ANALYSIS II - BENEFITS INCREASED 10%

<u>YEAR</u>	<u>NET BENEFITS</u>	<u>NET COSTS</u>	<u>(+ or -) DIFFERENCE</u>	<u>12% DISCOUNT FACTOR</u>	<u>DISCOUNTED DIFFERENCE @ 12%</u>	<u>18% DISCOUNT FACTOR</u>	<u>DISCOUNTED DIFFERENCE @ 18%</u>
1	- 137,974	1,521,480	- 1,659,974	.893	- 1,482,357	.847	- 1,405,997
2	+ 705,092	2,626,160	- 1,921,068	.797	- 1,531,091	.718	- 1,379,326
3	- 227,263	1,727,750	- 1,955,013	.712	- 1,391,969	.609	- 1,190,602
4	+ 289,233	1,569,050	- 1,279,817	.636	- 813,964	.516	- 660,385
5	815,976	352,000	+ 463,976	.567	+ 263,074	.437	+ 202,757
6	735,417	361,800	373,617	.507	189,424	.370	138,238
7	675,039	636,600	311,439	.452	140,770	.314	97,791
8	967,757	363,600	604,157	.404	244,079	.266	160,705
9	944,219	-----	583,919	.361	210,795	.225	131,781
10	1,070,657	-----	710,357	.322	228,735	.191	135,678
11	1,200,080	-----	839,780	.287	241,017	.162	136,044
12	1,329,503	-----	969,203	.257	249,085	.137	132,780
13	1,458,927	-----	1,098,627	.229	251,586	.116	127,440
14	1,588,349	-----	1,228,049	.205	251,750	.099	121,576
15	1,717,773	-----	1,357,473	.183	248,418	.084	114,027
16	1,847,196	-----	1,486,896	.163	242,364	.071	105,569
17	1,976,619	-----	1,616,319	.146	235,983	.060	96,979
18	2,106,042	-----	1,745,742	.130	226,946	.051	89,032
19	2,235,465	-----	1,875,165	.116	217,519	.043	80,632
20	15,230,047	360,300	14,869,747	.104	1,546,454	.037	550,180
					+ 268,618		- 2,215,101

Net Spread: $2,215,101 + 286,618 = 2,483,719 \div 6$ (percentage pts between 12% and 18% = 413,953)

Interpolation: $268,618 \div 413,953 = .65 + 12\% = 12.65\% = \text{IRR}$

April 10, 1974

ANNEX XII

Table 4

1. INCOME DISTRIBUTION EFFECT OF RANGE DEVELOPMENT IN NORTHEAST

<u>Year</u>	<u>Incremental Income^{1/} (\$000)</u>	<u>Population Affected^{2/}</u>	<u>Incremental Income/Capital^{3/}</u>
5	441.8	46,813	9
10	973.3	51,685	19
15	1,561.6	57,065	27
20	2,149.9	63,004	34

^{1/} From Table 2, Annex XII (Value of Incremental Offtake Only)

^{2/} Assumes beginning population in benefitted area of 42,400 growing at 2% p.

^{3/} Per capita income before project is assumed to be \$45.

2. INCOME DISTRIBUTION EFFECT OF RANCH DEVELOPMENT^{1/}

<u>Year</u>	<u>Incremental Income</u>	<u>Population Affected^{2/}</u>	<u>Incremental Income/Capita/Annum^{3/}</u>
1	965	10,000	96
2	2,090	23,000	91
3	3,908	35,000	110
4	5,707	51,000	111
5	7,189	52,000	139

^{1/} Source: IBRD Appraisal Report

^{2/} Assumes all ranches in by year 5. 60 group ranches with an average of 70 families per ranch or 4,200 families or 21,000 persons; 21 company and co-op ranches with an average of 50 families per ranch or 1,050 families or 5,250 persons; 100 commercial ranches with an average of 50 families per ranch or 5,000 families or 25,000 persons. Total population affected: 10,250 families or 51,250 persons.

^{3/} Per capita income before project is assumed to be \$56.

USAID TECHNICAL ASSISTANCE

Kenya Livestock Development Project

The National Range and Ranch Development (NRRO) Project provides three teams of Range/Ranch Planners, a Ground Water Specialist and two Livestock Economists to the Ministry of Agriculture.

Two teams of planners consisting of a Range Planner and an Agriculture Engineer work with RMD and WD officers to prepare detailed plans for the development and management of group, company and cooperative ranches as proposed under the Livestock Development Project. This planning includes locations and types of structures required for water, dips, firebreaks, housing, etc, numbers and types of livestock to be utilized, systems of grazing and overall management. They also prepare preliminary designs and cost estimates for water and building structures and finance projects for each ranch unit.

One range planning team will work in the northeast province development block. This team also is made up of one Range Planner and one Agriculture Engineer. This team, with counterparts, evaluates range areas and then plans the systematic development of manageable grazing blocks with infrastructure development of water resources and roads. In addition to preparing managements plans for the blocks implementation, they also design and supervise most of the actual construction of facilities. At the same time training for management of the developed areas is carried out for junior range management staff administrative officials and pastoralists in the area.

The Ground Water Specialist (hydrogeologist) serves the three planning teams discussed above in matters of development of ground water. This includes ground water surveys, site locations, designs and cost estimates for development of facilities and quality and quantity testing of water from facilities developed.

One livestock economist is the deputy to the Project Coordinator whose responsibilities and duties are described elsewhere in this report. In the position of deputy Coordinator his duties include a considerable amount of financial analysis and projections in addition to assisting with other duties described.

The remaining Livestock Economist is the principal economist for carrying out studies and developing plans for the livestock development in the Economic Planning Division of the Ministry of Agriculture. This includes all phases of the livestock industry in Kenya. It is on the basis of these studies and planning that the division recommends actions to be taken to the Ministry of Agriculture.

April 1974

ANNEX XIV

Page 1 of 2

IDA CONDITIONS AND RECOMMENDATIONS

During negotiations, assurances were obtained from the Government that:

- (a) Present FMD regulations would permit or be modified to permit the movement of health cattle from the feedlots by truck to the Athi River plant, provided that cattle were from ranches without clinically infected animals and that vaccination and quarantine procedures were properly implemented and supervised
- (b) Prior to any investment in water supplies in either Amboseli or Masai Mara Park, a negotiated agreement would be reached between the Masai cattle owners and Government on the exclusion of livestock from game reserves or parks supported under the Project and the payment scheme for permitting wildlife or ranch land
- (c) Terms of reference for carrying out the census and monitoring would be prepared in consultation with IDA
- (d) Within one year of credit signing consultants would be employed to carry out a meat processing feasibility study whose qualifications, experience, terms and conditions of employment would be accepted to IDA
- (e) Draft tender documents for all contracts expected to exceed US \$30,000 would be submitted to IDA for approval before invitations are issued. A board range of items of less than US \$30,000 would be purchased locally or, where appropriate, would follow Government procurement procedures. Livestock for the Project would be procured locally
- (f) The Livestock Marketing Division would set up a satisfactory accounting system under an experienced accountant who would establish financial procedures and introduce cost accounting and control systems
- (g) AFC and LMD would have their accounts audited by independent auditors acceptable to IDA and that accounts and auditors' reports would be sent to IDA no later than six months after the end of their financial years

- (h) LMD would charge fees which ensure financial viability
- (i) During negotiations an assurance would be obtained that a technical assistance contract would be executed during the loan period between KMC and an international meat processing company, the terms and conditions of the contract and the suitability and experience of the processing company subject to IDA's approval
- (j) Future appointments to Head of AFC Ranch Section, Head of Livestock and Range Management Divisions and Head of Range Water Division would be made in consultation with IDA
- (k) Price controls on all grades of meat would be phased out over three years following a plan acceptable to IDA
- (l) A grading and pricing structure relating live weight to carcass value and providing adequate incentives to procedures would be established in consultation with IDA within one year of the signing of the credit, and
- (m) An agreed staffing plan acceptable to IDA for technical and managerial staff setting out the main duties and responsibilities of the proposed posts, and the type, qualifications and experience of the staff to be recruited and the proposed dates of appointments would be carried out.

It would be a condition of the Board presentation that the Government would establish a Project Co-ordination Unit with appropriate supporting services and would employ a Project Director, and Assistant Project Director whose qualifications, experience and terms and conditions of employment would be acceptable to IDA.

Conditions of credit effectiveness would be:

- (a) Subsidiary loan agreements acceptable to IDA would be executed between the Government and AFC
- (b) All other financing arrangements under the financing plan had been made effective.

Subject to the above assurances and conditions, the Project would be suitable for an IDA credit of US \$21.5 million.

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

ANNEX XV

A.I.D. Loan No.:
Capital Assistance Paper No.:
Project No.:

CAPITAL ASSISTANCE LOAN AUTHORIZATION

Provided from: Development Loan Funds

Kenya: Livestock Development

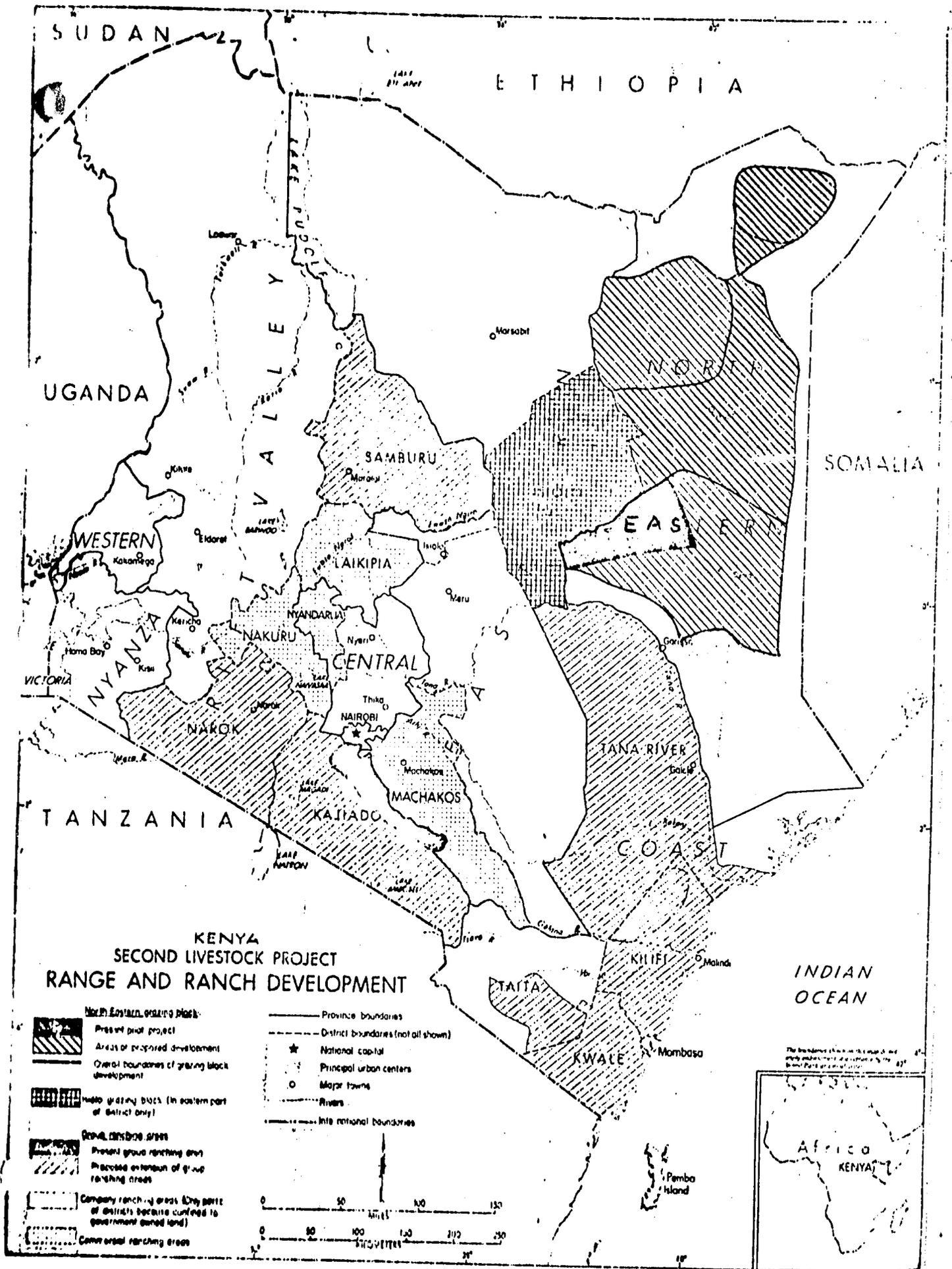
Pursuant to the authority vested in the Administrator of the Agency for International Development (hereafter called "A.I.D.") by the Foreign Assistance Act of 1961, as amended, and the delegations of authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter 2, Title I, the Development Loan Fund, to the Government of Kenya (Borrower) not to exceed nine million six hundred thousand United States dollars (\$9,600,000) to assist in financing the foreign exchange and local currency costs of livestock, equipment, materials, construction services, technical services and related service for northeast Kenya range development, Agricultural Finance Corporation subloans and domestic market surveys. This loan will be subject to the following terms and conditions:

1. Interest Rate and Terms of Repayment. Borrower shall repay the loan to A.I.D. within forty (40) years from the date of the first disbursement under the loan, including a grace period of not to exceed ten (10) years. Borrower shall pay to A.I.D. interest on the outstanding balance at a rate of two percent (2%) per annum during the grace period and three percent (3%) per annum thereafter.

2. Currency of Repayment. Provision shall be made for repayment of the loan and payment of the interest in United States dollars.
3. Other Terms and Conditions.
 - (a) Goods and services financed by the loan shall have their source and origin in those countries included in Code 941 of the AID Geographic Code Book and in Kenya.
 - (b) The Loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

Assistant Administrator for Africa

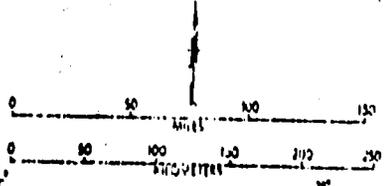
Date



**KENYA
SECOND LIVESTOCK PROJECT
RANGE AND RANCH DEVELOPMENT**

-  **North Eastern grazing block:**
 - Present pilot project
 - Areas of proposed development
 - Overall boundaries of grazing block development
-  **Water grazing blocks (in eastern part of district only)**
-  **Grassland reserve areas:**
 - Present grass ranching areas
 - Proposed extension of grass ranching areas
-  **Company ranching areas (they part of districts because confined to government owned land)**
-  **Commercial ranching areas**

- Province boundaries
- - - District boundaries (not all shown)
- ★ National capital
- Principal urban centers
- Major towns
- Rivers
- Inta national boundaries



The boundaries shown on this map do not imply endorsement of boundaries by the United States Government.