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EVALUATION REPORT

HASAI RANGE MANAGEMENT

AND

LIVESTOCK DEVELOPMENT PROJECT

621-0093

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USAID/DAR ES SALAAM
United Republic of Tanzania
U.S. Agency for International Development

MASAI LIVESTOCK AND RANGE MANAGEMENT PROJECT

EVALUATION REPORT

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PART I. INTRODUCTION

This Evaluation Report was prepared by a four-man team from the Agency for International Development in Washington in accordance with the original AID funding authorization of December 2, 1969 which stipulated that a special in-depth evaluation be conducted when the project had been in operation about two years. The contract with the Near East Foundation (NEF) as project action agent was executed in February, 1970 and the first NEF OPEX contract technicians arrived in Tanzania in June, 1967. (C7C).

The evaluation study was conducted during the three-week period January 13-February 3, 1973; prior to departure from Washington the team attended a briefing on the project's history and status by staff members of the Office of East and South African Affairs (AFR/ESA) and the Office of Development Services (AFR/ODS) of AID's Bureau for Africa.

During its stay in Tanzania the team, accompanied by USAID representatives, NEF and Tanzanian project staff members, made field visits to four ranching associations in Kijungu (Talamai), Ngorongoro (Korongoro), Kibaya (Konyo kio), and Monduli (Komolonik) in the Masai District and held discussions at these sites with officials of either ranching associations or Government Veterinary and Livestock Departments. Interviews were held with Tanzanian National, Regional, and District Development directors (or officers) in Dar es Salaam, Arusha and Monduli and the major recommendations were discussed there in detail. However, this final version of the Evaluation Report is the responsibility of the AID Evaluation Team only.

A PAR 73-1 and revised Logical Framework Matrix were included in this report as Annexes and also submitted separately to AID/W in accordance with the agency's management system procedures.

The team expresses its sincere appreciation to Government of Tanzania officials, USAID/Dar es Salaam and NEF for the very warm hospitality and excellent cooperation extended in the conduct of this evaluation.

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PART II SUMMARY RECOMMENDATIONS

A. Goal, Purpose, Targets

1. Revised Sector Goal is:

To obtain the highest national beef production possible with environmental conservation and improvement. Increased production and offtake will permit higher per capita protein consumption along with greater foreign exchange earnings from exports.

2. Revised Project Purpose is:

To reach a sustained high level of offtake in the Masai District consistent with proper land use, resource management and Tanzanian social and economic development goals.

3. Revised Conditions Indicating Purpose Achieved (EOPS)

- a) Eight RAs will have annual average offtake of 12% or more.
- b) Thirteen other RAs will be in various stages of development toward objective of 12% offtake or better.

B. Revised Project Implementation Plan

1. RA Management and Development Planning

New project implementation plan envisages complete, detailed range management and development plans on a sequential basis for the four most promising RAs in about 2 years; all existing RAs to be completed about 1975; and preliminary planning for registering desired new Associations in Masai District by 1980. Water installations would roughly follow same sequence as range management plans but the order might be modified somewhat to obtain the most efficient combination of available GOF local budgets, counterparts, personnel training and equipment utilization.

2. Land Use Classification

Recommend deletion previously proposed Water and Land Use Survey and instead a Land Use Classification for the Arusha Region by independent study group under 211-d which would help GCT strengthen its land policies and prevent cropping on land capable only of grazing. Independent study group would begin work in Masai District where NEF team would be responsible for detailed site and condition classification on the Masai areas determined to be range land. After completing the Masai District, the study group would proceed to the remaining Districts of Arusha, about 20% of the Region, for a more detailed land use survey with particular emphasis on crop production.

3. Water Development

Water investigations and installations, in accordance with RA development planning, will be directed by the NEF Surfacewater Engineer and the Groundwater Hydrologist, recommended as an addition to the NEF team, utilizing mainly the equipment provided under the current and prospective agricultural support loans. A maximum of surface water exploitation is planned for this equipment. Groundwater should be developed only where essential. All water development should be completed as planned at each respective RA before the equipment is transferred.

2. Proposed Expansion of Project Inputs:

1. Staffing:

a) Recommend three new NEF OPEX positions: Groundwater Hydrologist, Veterinarian and Heavy Equipment Specialist.

b) Following TDY or consultant assistance is also envisioned: Senior Range Management Advisor, Groundwater Geologist, Agricultural Economist, Data Processing Expert, Audio-visual Aids Technician, and perhaps others at a later date.

2. Training:

Participant and on-the-job training is to be expanded to provide counterparts for all NEF technician and for participation in the preparation and implementation of the RA management and development planning for each selected RA grazing unit.

3. Loan Components:

a) Under the contemplated 2nd Agricultural Support Loan, USAID should prepare commodity lists for about 1.2 million in equipment needed for project water and related development. This new figure includes some items previously expected as grant under the Water and Land Use Survey and certain additional items to permit two water teams to operate closely under central direction and logistical support.

b) Under the contemplated Agricultural Credit Loan, loans should be extended to various RAs to help finance ranch and water development as well as project operation and maintenance costs.

D. Range Management

1. Subdivide ranching associations to manageable units with grazing units subdivided into five paddocks.

2. Develop plans for each management unit.

3. Collect and record data on systematic basis as part of management plan.

4. Design and implement training program and range handbook for GOE range and other project personnel with provision for additional participant training.

5. Association/Paddock boundaries cleared to serve as access roads and firebreaks and define enclosures for farming.

6. Plan credit sources and assessment schedule of association members to pay development, operation and maintenance costs.

Animal Production And Disease

1. Recruit and assign Animal Production Specialist, provide additional position of Animal Health Specialist.

2. Collect and record data on herd composition.

3. Develop standard of selection, design upgrading and improved animal bandry management plans.

4. Develop management plan for better utilization of Ar dai station.

5. Design and implement program to identify; internal parasites; endemic Foot and Mouth disease areas; prophylactic and therapeutic disease program.

Marketing

1. Organize markets with supporting services and physical facilities.
2. Encourage cooperative marketing units with local marketing committees and associations.
3. Collect data to determine livestock numbers, and composition. Data will establish basis to determine off-take.
4. Develop information and contacts with buyers for marketing associations.
5. Promote consumer shops to service Association members.
6. Facilitate credit arrangement to meet development and production requirements.
7. Provisions needed for market news intelligence.

Other

1. Standardized data collection procedures should be initiated for the project.
2. Collected Data should be centrally processed, possible by mini-computer.
3. In order to determine the gradual phase - out, extension, or termination of this project, another in-depth evaluation should be conducted in early FY 1978, including cost/benefit analysis, and other relevant issues to be determined at that time.

PART III OVERALL EVALUATION4. REVIEW OF PROGRESS MADE TOWARD GOAL, PURPOSE AND TARGETS1. PAR 73-1

As requested in the USAID proposal outlining the frame of reference for this Evaluation Report, PAR 73-1 has been prepared and together with revised Logical Framework Matrix, included as Annex ~~A~~^B. The actual PAR 73-1 was based upon the original project documents, ProAg, PROP, and PIP, and, of course, the key performance indicators of these original documents. However, we have shown also in Annex ~~A~~^B a listing of the revised performance indicators and other suggested changes in the PAR format conforming to the corresponding items in the revised Logical Framework Matrix, or LogFrame as abbreviated. (Annex C)

Since, the PAR is a regular feature of AID's management system, we are also transmitting to AID/W, in the normally prescribed manner, copies of both PAR 73-1 and the LogFrame with appropriate references to the further details shown in the complete Evaluation Report.

2. Performance Indicatorsa. Inputs

As detailed in Part II of PAR 73-1, the NEF contract group of six OPEX technicians after serious personnel difficulties in the early years, now shows evidence of being a competent, well-unified team unusually familiar with the local cultural (milieu) setting. While overall performance has been noted satisfactory, the deficiencies in Range Management have resulted in significant lags in certain key outputs. Therefore the Evaluation Report contains a series of comprehensive recommendations which figure significantly in the proposed new project strategy and on the future project planning and implementation schedules.

There have also been lags or deficiencies on project commodities under both AID grant and loan funding but USAID recently completed actions to resolve them. In connection with the delivery of heavy well-drilling equipment now scheduled June 1973, this report includes recommendations for one additional NEF technician and corresponding counterpart and manpower training inputs.

The participant training program is on schedule and the Tanzanian Government (GOT) has provided even more counterpart personnel to NEF OPEX technicians than originally planned or anticipated. GOT has provided funds promptly for infrastructure installations and has also extended disease programs and water development efforts into non-project areas not yet included in Ranching Associations.

b. Outputs

The overall performance against output targets has been generally good but there are some weak points. Eight R.A.s have been registered and keen interest shown for 3 new ones; rights of occupancy is lagging on six R.A.s but this has not actually restrained operations. Masai willingness to cooperate has exceeded ability of technical staff to implement. Water supplies and dipping tanks have been installed and at least 75% of the herds are being dipped in each of four R.A.s. On 3 R.A.s there is already 40% water coverage on dry grazing areas.

In 2 R.A.s, trials with improved bulls have begun and the herds-men response has been favorable despite early losses of some bulls. Several Marketing committees have been formed with another in process and special markets have been arranged with positive results.

A serious lag has occurred in range management and grazing planning, thus practically nothing has been done to promote systematic management and coordination; therefore a series of specific recommendations on

future actions is included in this Evaluation Report.

3. Project Production Targets

Although this project's Sector Goal and Project Purpose have in the past been modified slightly, the measure of achievement has clearly been the concept of an increase in physical livestock production in the areas of project operations. The indicator chosen was the annual average cattle offtake, estimated at 7% in the base year FY 1970, and the target set at 15% for FY 1980.

Statistics and factual data on livestock in the country are still fragmentary and it has not yet been possible to obtain direct evidence of the levels of offtake or naturally, the annual changes in offtake. There are available estimates of total cattle population largely based upon projections from census data taken in 1954 and 1965 and annual offtake figures are variously estimated from animals marketed through official channels and hide export figures.

In making analyses of the available data, the Evaluation Team was able to apply certain refinements by using tables of dynamic parameters in a constant sized cattle population at different effective calving rates and/or varying levels of commercialization. These parameters have been assembled from various sources over the years and are shown in a table and graph form at the end of the section on "Marketing" in Part IV C of this report. These data are particularly useful when making projections on possible offtake and in drawing conclusions on herd composition and industry status from information taken in the market place, especially on slaughter animals by age and sex.

Using the methodology outlined or described above, the Team has confirmed 7% offtake as the base line for FY 1970 and has lowered the target figure in FY 1980 from 15% to 12%. Taking account of the normal cattle reproductive cycle and the corresponding amount of time necessary for cumulative changes in basic factors such as calf weaning and calf mortality to be reflected in increased cattle numbers and offtake, the 12% target is judged to be more realistic for purposes of this project and compared to the 7% of FY 1970 represents almost a doubling of the average annual rate.

The team believes that NEF's use of this analytical tool applied to available data, along with additional sample surveys at RA dipping vats as recommended in the Marketing section, will yield more satisfactory estimates for national livestock but particularly for the project Ranching Associations.

It is recommended that NEF makes continuous efforts to compile necessary data and to refine the necessary estimates of offtake and other key parameters.

4. Revised Statements of Goal and Purpose

a. Sector Goal

To obtain the highest national beef production possible with environmental conservation and improvement. Increased production and offtake will permit higher per capita protein consumption along with greater foreign exchange earnings from exports.

This is only a slight revision from the previous version and merely specifies the GOT policy interest in expanding national livestock production in order to increase both foreign exchange earnings and per capita consumption.

b. Project Purpose

To reach a sustained high level of offtake in the Masai District consistent with proper land use, resource management and Tanzanian social and economic development goals.

The reference to GOT goals was inserted in the formulation after lengthy discussions with national, regional and district officials and reflects the strength of GOT's current emphasis at the local level on the provision of social services, e.g., schools, clinics, housing, etc. It is understood that this project is directed toward the socio-economic aspects of livestock production and development but these GOT officials are responsible for all developmental activities and the need for close coordination becomes more urgent. For example, GOT officials wish that RA boundaries confirm as nearly as possible to the Ward or basic political/administrations unit in Masailand. Also, the management plans for the individual grazing units should take account of the planning of various Government departments for schools, clinics, etc., and GOT for its part should be well informed of project planning and operation requirements.

Under the new GOT reorganization the Masai Project is under the direction of the District Development Director and more specifically the District Livestock Officer, particularly for technical matters. Nevertheless, some problems may arise in the future and we suggest that USAID Project Managers keep a close watch on this matter.

B. VALIDITY OF PROJECT DESIGN

Having reviewed the documentation on the history and background of the project, visited field sites, discussed details with USAID, NEF project staff, and GOT national, regional, and district officials, and prepared PAR 73-1, the evaluation team has concluded that the project design is valid. This judgment is conditioned by the team's knowledge and experience in the field of animal agriculture and comparison with similar types of livestock development undertakings in other parts of Africa.

The project operates in a clearly defined, relatively insulated, homogeneous geographic area having a generally favorable climate and an extensive but protected vegetative natural resource base, not as yet unduly subject to the pressures of human or animal population; there is, therefore, a demonstrable potential for increased production and animal agricultural development.

With initial personnel difficulties now remedied, the NEF technicians currently in the field are enthusiastic, energetic, dedicated and would constitute an integrated, complete multi-disciplinary group, with the inclusion of the Animal Health Specialist, Groundwater Hydrologist and Heavy Equipment Specialist proposed in Part IV of this report and particularly the Sociologist/Extension Specialist who, already within a few months since his arrival, is exercising an extremely active role in project activities over a wide-ranging area in the District.

The GOT has provided strong leadership and support for the project in manpower training, counterpart personnel, materials, and infrastructure funding. Under the recent broad government reorganization, executive responsibility for this project is now at the Regional and District levels, much closer to the local situation, which reinforces GOT support for the whole undertaking. Adding further impetus is the recent selection of the Masai District for priority development within the Arusha Region.

In its concern for equitable returns and benefits to the small holders, low income rural Masai herdsmen, the project is consistent with AID's current program emphasis and GOT's increasing concentration on social welfare for rural peoples through the "Ujamaa" concept of nationwide, cooperative, self-help organization at the village level, rooted in traditional African culture and family structure. Furthermore, this on-going project is integrally related to a major, large scale beef development scheme which the GOT National Government has already initiated with IDA loan financing and based upon a comprehensive 1971, IDA Sector Analysis for Livestock.

The essential feature of the original project plan of action was the early installation of combined water and dip facilities in order to obtain some immediate short-term acceptance of new ideas and change because of short-term

improvement in the Masai environment rather than the promise of benefits to accrue in the future. The efficacy of this approach seems well borne out by the progress made in the first two years of operation. Although dipping vats had existed in some parts of Masailand for many years at the outset of the project, many Masai herdsmen remained skeptical of their value and the advisability of joining RA's to take advantage of improved Animal Health through their use. But the actual responses to the project's demonstration effect were more than exceeded expectations.

Cattlemen were immediately aware of declining calf mortality resulting from the control of East Coast Fever through dipping. Various R.A.'s have been pressing for additional dipping facilities and numerous initiatives are underway to organize more R.A.'s. Generally Masai's willingness to join the program is exceeding the current staff and material resources for implementation. Three R.A.'s have already raised their own investment funds for replicating these development facilities. With its priority concern under "Ujamaa" for organizing cooperatives at the village level, GOT both nationally and regionally, is anxious to expand the number of these cooperative ranching associations as rapidly as manpower and other resources will permit.

It is mainly the phenomenon of East Coast Fever, effectively controlled by dipping to reduce tick infestation, together with a somewhat more favorable resource base and climate, which determines the relatively higher potential for increasing livestock production in Masailand compared to many other regions in East -, West - and Central Africa.

C. REVISED PROJECT IMPLEMENTATION PLAN

The essential ingredient of this revision is a series of complete R.A. Range Management and Development Plans which is outlined in Part II, Summary Recommendations and set forth in detail in Part IV, A - Range Management. This planning on a sequential basis for the four most promising R.A.'s should be completed in about two years; all 8 existing R.A.'s completed about 1975-76 and the preliminary planning for registering the desired number of new Associations in Masai District by 1980. Water installations and other planned operations would roughly follow in the various R.A.'s in the same sequence as the range management plans, but the order might be modified somewhat to obtain the most efficient combination of available GOT local budgets, counterparts personnel training and equipment utilization. If the training schedule is satisfactorily met, a separate GOT staff planning team might be split off in early 1975 to initiate the registration process for the new R.A.'s.

This evaluation recommends the deletion of the previously proposed Water and Land Use Survey and instead the organization of a Land Use Classification for the Arusha Region by an independent group under 211-d, perhaps the University of Hawaii. We believe such a study would strengthen the GOT position in formulating and enforcing its land use policies and also help prevent cropping on land capable only of grazing. The independent study plan would begin its work in the Masai District where the NEF team would be responsible for the detailed site and condition classification on the Masai areas determined to be rangeland. As presently constituted, the NEF has the competence for range classification but not soils classification which expertise hopefully would be provided by the independent study group.

After completing the Masai District, the study group would proceed to the remaining Districts of Arusha, about 20% of the total Region, for a detailed land use survey with particular emphasis on crop production. However, the NEF team would have no further involvement beyond the Masai District.

The water investigations and installations to be performed in accordance with the detailed R.A. development planning will be directed by the NEF Surfacewater Engineer and the Groundwater Hydrologist who is being recommended as an addition to the NEF team. The necessary equipment is expected under current and prospective agricultural support loans. The new second loan now estimated at \$1.2 million, reflects the inclusion of some items previously

expected under the Water Survey grant and certain additional items needed to permit two water teams to operate in close contact under central direction and logistical support. USAID should complete the commodity lists for the proposed loan and should seek TDY assistance if needed for the preparation of specifications.

As noted above the water development should roughly follow the same sequence as the range management plans and all planned work should be completed at each respective RA before the equipment is transferred. A maximum of surfacewater exploitation is planned with this equipment; groundwater should be developed only where essential.

C. PROPOSED EXPANSION OF PROJECT INPUTS

1. Staffing

a) NEF Staff

The following three additions are proposed for the NEF team: Groundwater Hydrologist, Veterinarian and Heavy Equipment Specialist. The detailed requirements and proposed function of these staff are summarized in Part II and explained further in Part IV.

b) TDY Assistance

The current Range Management Specialist is young, energetic and competent, but lacks experience in Africa in the formulation of comprehensive range management and development plans. We therefore, recommend the services of a Senior Range Management advisor for a period of about six to eight weeks to assist the NEF technician in organizing, at the first RA, the required planning undertaking. The efforts at the first 1 or 2 RAs in the proposed implementation plan, because they will serve as on-the-job training exercises for the combined project team of NEF technicians and GCE project staff. Copies of Annex D of this report, Guide to Range Management in Africa, have already been made available to NEF at Arusha and USAID/Dar es Salaam.

Listed below are the additional TDY services currently envisioned. Other needs may arise at a later date. Details are explained in Part IV.

1. Agricultural Economist
2. Groundwater Hydrogeologist
3. Data Processing Consultant
4. Audio-Visual Aids Specialist

Training:

Participant and on-the-job training is to be expanded to provide counterparts for all NEF technicians and to participate in the preparation and implementation of the RA management and development planning for each sub-divided RA grazing unit.

Loan Components:

Under the contemplated second agricultural support loan, USAID should complete commodity lists and specifications for about 1.2 million in equipment needed for project water and related development. This includes action items needed to permit two operating teams in the field in close contact under central logistical support.

Under the expected agricultural credit loan, RAs will hopefully have a source of credit for financing planned ranching development as well as operation and maintenance costs.

PART IV. REVIEW OF MAJOR LIVESTOCK DEVELOPMENT COMPONENTS

A. RANGE DEVELOPMENT AND MANAGEMENT

1. Observations

The Range Management portion of the project is in an infant stage and little has been done in developing management plans for the eight associations which have been registered to date.

Some development of water and dips has taken place without development plans for implementing the grazing system. These may or may not be located properly when a management plan is developed. Also quantities of water provided may not equal requirements.

Ranching associations are not adequately demarcated and some encroachment of cultivators is occurring. Also cultivation within the associations is occurring on land that may not be suited to crop production on a continuous basis. Farming should be discouraged on all areas not suited to crop production.

Masailand lends itself to development of extensive management units which would be economically viable. The presently registered associations, which average about 300,000 acres each are still too large to manage as one grazing unit and should be subdivided, for purposes of management, into units of 100,000 to 150,000 acres each. Each individual management unit should be subdivided into a five-paddock grazing system which will allow a three-month rotational grazing pattern with the fifth paddock reserved as emergency forage in draught years and as a means of controlling bush encroachment through controlled burning. Boundaries and subdivisions should be cleared and maintained annually to serve as boundaries for grazing animals, firebreaks, and access roads.

The units should be mapped from available aerial photograph mosaics which would record range site and condition, existing and planned structural development, proposed subdivisions, and season of use (wet or dry season) for the subdivisions.

Members grazing livestock on the unit should have their animal numbers recorded and assigned that percentage of the total herd that their animals constitute in order to determine their responsibility for repayment of future development loans, annual operation and maintenance costs. Also, this should be used as a measure of his allowable increase or required decrease in future numbers of livestock.

Forage inventories should be used as an initial estimate of proper stocking rate with annual inventories to determine adjustments necessary in numbers of animals to balance available forage with number of animals.

Water development should be planned to implement the grazing system. Quantities of water required, at what season of the year and the desirable location should be stated in the management plan. Distribution of water points from which animals graze within a 3.5 to 4 miles radius, should be used as a basis for balancing water required with available forage for livestock. The most economical sources of water such as surface storage should be investigated before developing sources with high annual operation and maintenance costs, e.g., pumped bore holes, or extensive pipelines from streams and springs.

Dip locations should be planned for use by two or more of the grazing paddocks. The design already being utilized is good and effective use is being made of existing dips by livestock owners. Cattle are relatively free of ticks and tick borne diseases have been brought under control where animals are dipped regularly. Caution should be taken to insure dip strength is kept at required levels.

Permanent line transects with permanent grid plots should be established as a means of recording vegetations' trends over long periods of time. Also rain gauges should be placed on each association to determine annual rainfall.

The Tanzania Range Act of 1964 is quite adequate to form ranching associations with the legal right to the area adjudicated and to obtain credit from available sources for further development.

Credit for development, operation and maintenance cost should be considered as an appropriate means for more rapid development of the livestock industry in Masailand. Such development is economically feasible and the burden of repayment should be placed on the beneficiaries rather than on Government. Operation and maintenance costs should also be assumed by the livestock owners rather than by Government.

The NEF Range Management Advisor should develop a handbook setting out jobs to be done each year on the grazing association with instructions as to how to perform the job and charts for recording data gathered. This data should be recorded as a long-term record of production under known circumstances.

The rate of planning and development will largely depend upon how fast the Tanzanian Government can provide counterparts for on-the-job training and participants for additional academic training. The majority of the data required for planning and development purposes will be gathered by trained Tanzanians, from which the team can formulate management and development plans.

There are requirements for additional personnel on the team to fill disciplines which are missing from an integrated approach. Animal health is provided by the Government Veterinary Service which is seriously understaffed and poorly equipped. A Veterinarian should be added to the team. Operation and maintenance of the heavy equipment for construction will require the services of a Heavy Equipment Specialist to train operators and mechanics in the efficient operation of machinery and proper maintenance and repair.

The services of a Ground Water Hydrologist will be required for locating proper drilling and equipping of bore holes.

2. Recommendations

a. Present ranching associations are too large to manage as one unit and, therefore, they should be subdivided into management units 100,000 to 150,000 acres in size. Also, the 25,000 acre bull-breeding ranches expected from 2nd loan IBRD should be planned for each of the eight associations.

b. Range management and development plans should be completed for each management unit. Staff should be trained and planning done on one association at a time rather than fragmenting staff over several associations.

c. Data collection should be done on a systematic basis and recorded as a part of the management plan.

Data should include:

Range site and condition map.
 Forage inventory and bush density.
 Estimated annual carrying capacity.
 Census of animal herd with age and sex categories. This data should be recorded for each member of the ranching association.
 Range trend should be studied through the use of line transects with permanent photo grid plots.
 Rain gauges should be placed on each management unit to record annual precipitation.
 Present water locations with quantity available.

d. Additional participant training in Range Management, Animal Science, Livestock Extension, Veterinary Medicine, Hydrology, Agricultural Engineering (two aspects - surface water development and operation and construction with heavy machinery).

e. Additional positions on the NEF team to include Veterinarian, Heavy Equipment Specialist, and Hydrologist.

f. Grazing management units should be subdivided into five paddocks; management would include rotational grazing on a three-month basis with the fifth paddock held for emergency grazing during drought periods and controlled burning for bush control.

g. Boundaries of Associations, management units and grazing paddocks should be cleared by bulldozer and graded to serve as access roads and firebreaks.

h. Farm land should be cut out as enclaves and boundaries demarcated around them.

i. Develop Range Manager Handbook with jobs to be performed and tables for recording data.

j. Plan possible credit source for range development program.

3. Summary

Although range planning and development are behind schedule at this time, targets can be achieved or even surpassed by a concerted effort on the part of the present team. The speed with which the team proceeds will largely depend upon how many Tanzanian counterparts the team trains to collect and assemble data for planning and development.

Base data is practically nonexistent and should be a major effort on the part of the team to collect sufficient data for future production and marketing intelligence.

Financial requirements for the development and operation of the magnitude the Tanzanian Government envisages will be quite large and probably will require outside financial assistance for the purchase of additional equipment and maintenance and operation costs.

Masailand has large resources in range land, potential water development and livestock which at present are being utilized in an inefficient manner by nomadic cattle producers. The resources can be mobilized to effectively contribute to the national economy and utilize the human resources which are largely subsistent at present. Increased beef production to meet growing local and export demands should be one of Tanzania's major revenue earners in the near future.

A Division within the Ministry of Agriculture with Regional and District Officers to develop range extension, planning and management skills should be established. Major emphasis should be placed on training staff for this division.

3. ANIMAL PRODUCTION AND HEALTH

1. ANIMAL PRODUCTION

a. Observations

Masailand, like other areas in Africa, has no shortage of problems to be solved, if animal agriculture is to develop.

The indigenous shorthorn zebu breed that is predominate in Masai herds lacks genetic capability and capacity for high rates of gain and early maturity that is often envisioned by planners. The genetic limitations are a factor that must be considered when establishing project goals. (The project goals outlined in the current PROP "to increase the average herd size from individual animals weighing 600-800 pounds at 60 months to 1,000 pounds at 30 months; lower the cow's age at first calf from five to three years; increase the calf crop of mature cows from 50 percent to 90 percent annually" are not realistic in terms of achievement due to the breed characteristic and genetic limitations). However, this does not imply that significant improvement cannot be achieved if these animals were provided an opportunity to demonstrate their genetic potential. Masai cattle can be upgraded by the introduction of improved husbandry practices.

A good cross section of cattle were observed during visits to the Association. The large animal population in Masailand provides a base for the selection of animals that could establish a greater uniformity of type for a large scale upgrading program. Standards of selection will have to be established. (This must be developed with Masai herdsmen as they are presently selecting bulls from better milking cows. When questioned they also expressed preference for black or gray cows with a black switch and black pigmentation around the eyes and muzzle).

In the Associations visited there is evidence that calfhood mortality has declined since inception of the project. This decline is attributable to the regular dipping regime followed by members of the Association. The District Veterinary Officer and members of the NEF attribute this decline in mortality to checking the incidence of East Coast Fever. (East Coast Fever is a highly pathogenic, tick transmitted, protozoan disease of cattle peculiar to areas of East Africa, where the principal vector Rhipicephalus appendicolatus is present ¹). Association cattle observed prior to dipping were remarkably free of ticks or skin lesions that might be attributable to blood-sucking parasites.

Nutritional problems (calfhood and mature cows) are no doubt present, what they are has not been identified with any degree of precision. Calcium and phosphate deficiency in cattle is a problem in most developing countries. Unfortunately, the high load of internal parasites Masai cattle no doubt have masks the manifestations of nutritional diseases. The present management system followed by the Masai is no doubt contributing to the internal parasite problem.

The lack of basic data makes it difficult to establish realistic targets. Herd composition data is required for estimating off-take, calving percentages, mortality rate, grazing rate, developing water facilities and other needs for a rational management plan to develop the Association. (This need for herd composition studies was recognized by Dr. William W. Peek in his End of Tour Report dated 15th February 1972). It is essential that a plan be developed and implemented to secure this data. Without baseline data, it is not possible to measure progress in meaningful terms.

The natural forage resource base and apparent receptivity of Masai livestock growers provides the Government of Tanzania an excellent opportunity to develop animal agriculture in the Masai district.

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Foreign Animal Diseases, Their Prevention, Diagnosis and Control,
Revised 1964

The rationale for establishing Associations that delineates boundaries by grazing patterns and carefully considers sociological factors to decrease stress within the Masai community is realistic, and, is no doubt, a contributing factor to the apparent confidence the Masai have demonstrated in the Project team. The GOT must build on this modest start by developing an overall plan that sets forth a schedule for registering Associations, work plans, personnel requirements, resource allocations for initial investment, e.g. dips, water points, logistic support and estimated annual recurring costs. The overall development plan should consider the capability and capacity of the GOT to finance and service the development of Masailand. The plan should take into account how the IBRD or other donor proposals might be linked to the development of animal agriculture in Masailand, for example, the 8 ujamaa type breeding ranches currently being considered in the second IBRD Loan Program.

b. Recommendations

The present Near East Foundation (NEF) staffing pattern provides an animal Production Specialist. This position should be filled as soon as possible to:

1. Develop an outline for a breeding and improved animal husbandry management program that will serve as the basis for implementing animal management plans for each association. The management plan should set forth what, where, and when improved practices will be implemented by project personnel with realistic targets of what is to be accomplished. This outline should be developed in collaboration with District livestock, district veterinary, project range, marketing, project veterinary, and sociology specialists and officers of the Association.

✓ 2. Initiate plans to secure information concerning herd composition. This data is needed to establish a data base for short- and long-range planning, allocation of resources, grazing requirements, off-take, birth rates, death losses, etc. (The design of method, data composition, and form should be developed jointly -- this will permit the development of a single source form that will serve all project requirements for data -- with Range, Veterinary, Marketing, Sociology and Association Officers).

3. Develop a standard of selection that is needed prior to implementation of an upgrading program. The goals of the upgrading program should consider weight for age, mothering characteristics, fecundity, color and other factors that should be determined in consultation with Masai herdsmen, project veterinary and range specialists.

4. Design and initiate training programs in the association for livestock, range and veterinary officers. Modified training programs for association officials should be conducted. The training of association officers should enhance their understanding of project objectives and assist project staff in receiving greater cooperation. Training should be simple and within the capability of GOT technicians and association officers to understand and implement. Training programs for project field staff. Training should be simple and within the capability of GOT technicians and association officers to understand and implement. Training programs for project field staff. Training programs should be phased to provide technology required to implement improved husbandry practices set forth in the annual management plan.

5. Develop a detailed plan for better utilization of Arday station. The plan should consider upgrading present cowherd. The standard of selection for association cattle should be used to select breeding cows that could form nucleus of breeding herd to produce improved bulls for associations. The possibility of using the station for technical training of association staff should be explored. This training should not displace field training programs that will be carried out in the associations. The design and conduct of training programs should not call for large investment of resources or incur recurring costs greater than presently allocated to this operation.

2. ANIMAL DISEASE

a. Observations

Rinderpest and contagious bovine pleuropneumonia in Masailand has been successfully contained by a Government vaccination program. Based on vaccination records the livestock population in Masailand is estimated at 1 million. The District Veterinary Officer believes statistics on overall livestock numbers in Masai District are fairly good because several careful checks have been made on animals vaccinated and coverage appears to be universally complete.

In discussing other diseases with the District veterinary officer (DVO), it was apparent that anthrax, hemorrhagic septicemia, rabies and a number of arthropodborne protozoan infections are problems in Masailand. He also indicated that there are a number of debilitating diseases that need identification prior to determining distribution, location and their effect on Masai cattle. There is a real need to work closely with animal production personnel to identify and determine nutritional deficiencies.

Present veterinary services of Government are deeply committed to carrying out mass vaccination programs to contain rinderpest and contagious bovine pleuropneumonia. (The Government veterinary services are effective in containing these disease). Foot and mouth disease is endemic in traditional livestock producing areas. Type O, Type A, SAT-1 and SAT-2 occur in Masailand. There is a real need to determine type and to identify endemic areas in Masailand. Present Government policy to maintain a strict control program that requires vaccination and quarantine of trade cattle and quarantine of infected herds is meeting with some success.

The dipping program that is being carried out in the associations is containing East Coast Fever (ECF). The continued success in containing ECF will require better control of the dipping tanks in the associations to assure proper strength of solution and operation of the dip tanks. Data is needed to determine rate of fertility and identification of diseases and causes influencing low fertility rates in Masai herds. This information is not available at this juncture. This basic information and the services of a veterinary officer are not presently available to the project on a continuing basis. The services of a Veterinary Specialist are needed to provide an interdisciplinary approach for planning and implementation of disease control activities in the associations.

Justification for a project veterinarian is based on the limitation of the present government veterinary services in Tanzania because:

- a. Insufficient number of DVMs are available to carry out country-wide prophylactic and therapeutic animal disease programs.
- b. Need for concentrating resources to control rinderpest and CBP.
- c. Insufficient number of senior staff limits provision of diagnostic services to identify diseases, endemic areas and treatment that affect cattle production in Masailand.

out The quality and efficiency of the GOT veterinary services in carrying vaccination campaigns are excellent. The blood testing following the JP-15 rinderpest eradication program showed that the percentage immunity of the population of cattle in Masai district was the highest on the continent. This is indicative that a viable veterinary program is being carried out at present, although it must be recognized that rinderpest is but one of a number of diseases in the Masai district and the control of one disease does not necessarily infer control of all diseases. It does indicate, however, that the personnel, resources and experience for control of other diseases are existent.

b. Recommendations

Establish the position of Animal Disease Specialist to be assigned to the NEF staff. This Specialist will be concerned with the identification of disease problems and design of their control within the associations.

NOTE: This specialist is not to be used for the present day-to-day operations conducted by the District Veterinary Office. Vaccination campaigns, control and administration of veterinary personnel, finance of veterinary activities, etc., are to be retained by the officer in charge of the GOT veterinary division.

This Specialist will provide a multi-disciplinary approach that is required to:

1. Develop and overall prophylactic and therapeutic animal disease program for each association, (plan would be developed in coordination and collaboration with animal production, range, and determination of equipment and its utilization in carrying out the plan. Planning should be coordinated with the District Veterinary Office.
2. Initiate plans to identify and classify internal parasites infecting Masai cattle so that treatment may be included in disease management program. Also, identify endemic foot and mouth disease areas within association, and other debilitating diseases effecting Masai cattle. (Present boma management system conducted by the Masai contributes to internal parasite problems. *Cysticercus bovis* is a recognized problem. The identification of other parasites is required for treatment and control that should be included in the management plan).
3. Design and conduct training programs to increase capability of veterinary field personnel assigned to associations. (Training should include testing and control of dipping solutions, data gathering, diagnosis, prophylaxis and therapy of diseases existent in the associations).

3. Summary

The project objectives, goals and targets that are now set forth are realistic and attainable with the development of association plans. The degree of success in achieving project objectives within the present time frame will be dependent on USAID and GOT inputs of technical personnel, administrative and logistic support, initiation of policy or legal changes that may tend to inhibit implementation of association management plans.

The GOT is most fortunate in having a large natural resource base (man, animal, forage) that is essentially untapped. To date this resource base has not been greatly disturbed through multi-use, overpopulation of animals or man. It is a resource base capable of making a sustained contribution providing it is properly managed and not manipulated to meet short-term goals.

The basic infrastructure for veterinary services is in place and efficient albeit short of staff but performing more than adequately to control rinderpest and CBP. There is a need to accelerate training of animal husbandry and veterinary personnel (at all levels to carry out associations management plans as envisioned by the GOT. The implementation methods being used are suitable. This is one of the few AID livestock projects using a multi-disciplinary approach in the key problem area of animal agriculture. The provision of an Animal Disease Specialist and recruitment of the Animal Husbandry Specialist will round out the animal production team to work with the other disciplines.

The general livestock disease (rinderpest, CBP) situation in Tanzania should not impede the development of Masailand. However, there is a need for additional work in animal diseases within Masailand as indicated in P.2 above.

Present resources or proposed new investments should not be made for genetic improvement through artificial insemination schemes. (The project team should not at this juncture divert their effort or attention from cattle to proposals to harvest or control game animals in Masailand).

For future planning (Year 8) purposes the GOT might consider a model that:

A. Allocates range lands and transforms it into TDM for animal feed. (Supplemental feeding could be part of model).

B. Determines how rate of TDM affects animal births and deaths. (Effective calving rate).

C. How availability (levels) of TDM increases rate of maturity, weight for age.

D. Determines qualitative population changes resulting from up grading and herd composition.

E. Determines how government policies can enter systems through incentive, improved marketing structures, extension, etc.

7. MARKETING

1. National Level

Factual information concerning the National Livestock Industry of Tanzania is both fragmentary and unreliable. Estimates of the total cattle population vary between 10 and 13 million head and are largely based on projections made from census data taken in 1954 and 1965. Annual off-take rates are variously estimated from animals marketed through official channels (318,000 in 1970) and hide export figures which also include salvage from adult mortality (374,000 in 1970). While total herd inventories are estimated to have increased over the years by something in the magnitude of 2.5% annually, it is probable that numbers have about peaked out at present in response to urbanization, population increases and mounting demand generated locally and from the adjoining countries of Kenya, Uganda and Zambia.

The low reproductive/productive coefficients; a calving rate of 55%; a calf mortality and adult mortality of some 30% and 10%, respectively; an average liveweight at slaughter of 250 kg; an average steer age at slaughter of about six years, can be largely attributed to poor nutrition, high disease incidence and a subsistence system of management in which cattle are marketed as a by-product of a way of life with all that this implies.

The national system of cattle marketing is presently in a state of disarray with demand, supply and price information clouded by Government policy which has tended to be consumer orientated and includes measures to bypass and/or eliminate the old established, traditional marketing infrastructure. District Development Councils operate about 120 permanent primary markets and the Ministry of Agriculture some five secondary types, but all are poorly organized and without adequate physical facilities. The primary producer is rarely the seller in these markets as offered animals have already passed through the hands of one or more bush buyer/traders. The combination of Government control of retail meat prices in some instances, high market fees (8 shillings per head by seller and 5% of sales price by buyer) and veterinary charges (up to 13 shillings per head) have effectively driven much of the cattle trade underground, resulting in meat shortages in many areas, increasing clandestine export of live animals on foot, reduced producer incentives and a declining slaughter weight, all without a significant increase in productive efficiency. In this connection it is of interest to note that the average live weight of animals passing through the S.M.I. plant in Dar es Salaam was: 495 pounds in 1950; 545 pounds in 1967; and 575 pounds in 1972.

However, Government has placed high priority on agricultural and rural development in the second five-year plan, and a request has been made to the World Bank for a loan in support of upgrading livestock marketing on a nationwide basis. Plans call for establishing a parastatal Marketing Company that would take over all major markets in the country and also serve as order agency for Tanzania Packers Limited (only operating packing plant in the country and located in Dar es Salaam), NACO Ranches and District Development Councils. The company would also develop and operate such support services as truck routes, holding grounds and quarantine stations. Cattle sales would be by auction and private buyers would be permitted to participate in bidding. Marketing services would be provided at or near costs without a specific profit motive per se. Among requirements for loan consideration were assurances that controlled retail meat prices would be gradually discontinued.

Apart from maintaining the foregoing basic marketing facilities and services, a new abattoir of 25,000 head annual capacity would be built at Mbeya in the south to kill mainly for chilled beef going to Zambia, but also catering to the local hot meat trade. A similar plant would be established at Shinyanga in the North for shipment of carcasses to Tanzania Packers Limited. This abattoir would also accommodate the local hot meat trade.

Lastly, the TPL plant in Dar es Salaam that was established in 1950, would be completely rebuilt.

It is envisaged that the foregoing marketing company would handle some 50% of the nation's estimated annual slaughter offtake of just over one million head of cattle.

On balance, it would seem that total beef demand is fast outstripping increases in productivity, with the result that no excessive backlog of surplus animals exist today. Hence, the conclusion that there will be an indefinite sellers market for beef and ever higher prices will prevail. This effectively militates against canning for export, both now and in the future.

2. Masailand

The total area of Masai District, which encompasses some 80% of the Arusha Division, is 24,134 square miles. Cattle number in the realm of over a million head. While there is reasonable evidence that Masai cattlemen are still building up herd inventories, by the same token there is no overt indication that such herds contain an overly high proportion of mature age market steers. Although the Masai are more conservative than other cattle-owning peoples in Tanzania and they are more possessive of their herds, it is presumptive to suppose that they would not sell under the right conditions. For example, most authorities in West Africa were for years positive that the Nomadic Fulani of the area would not part with breeding stock under any circumstance. Yet the facts are that in 1963/64, with good slaughter bulls selling at 40 Nigerian pounds, the offtake by sex from Fulani herds averaged 25% females and 75% males. In 1970/71 with similar cattle selling at NF 80, the offtake by sex was 40% Female and 60% Male. This circumstance was largely attributed to high price inducement coupled with an increasing want for and ready availability of consumer goods. In this context, the Masai today is judged to stand in about the same position as the Fulani in 1967/68. Certainly these two peoples are not totally different with respect to response to socio-economic pressures.

The argument as to whether or not the Masai will sell surplus animals is fast becoming an anachronism. Change in Masailand is inevitable as evidenced by the daily battle between the Boma (cattle camp) and the Shamba (farm plot). Since history teaches that the plowman usually wins in such conflicts, the real issue is will the Masai be the victim of or the beneficiary of change, but change he must.

The foregoing is not to imply that the Masai will automatically honor established stocking levels and agree to needed offtake rates. Because he has heretofore been forced to maintain extra animals as a hedge against the ravages of disease and ever-impending drought, he must first be convinced that these dangers are no longer a major threat. Without doubt this calls for combined and dedicated effort by all of the responsible technicians of the Masai Project, but especially it falls to the lot of the sociologist to pave the way.

With the foregoing in mind and in the realization of their inadequacies, the following recommendations are made in support of improving the marketing component of the Masai Project. The listing is not necessarily in the order of importance and some of them would not normally come under the heading of marketing, but they are collectively basic to and vital in effecting a sustained economic offtake from Masai herds.

a. General and Supporting

There is need to intensify marketing efforts in Masailand on the grounds that project success or failure will eventually be measured in terms of the annual offtake attained. A participant in marketing is expected to return to the project in late 1973 as counterpart to the NFF marketing specialist. At this time it will be expedient to develop a marketing program and plan of work including an assessment of additional local manpower and associated training needs. In the early stages the marketing plan should be biased in favor of the sociologist, but this should in due course give way

to an economic and cost/benefit approach. Every effort should be made to link Masai Marketing with the overall National Marketing System. Further, appropriate logistic support, especially with respect to transportation for the responsible staff, is basic to success. Lastly, it would be advisable for project marketing staff to establish contact with other livestock projects having marketing components throughout Africa, with the view of sharing experiences, both successes and failures.

b. Organized Markets

Marketing support facilities in the form of trek routes, water points and actual market sites must be developed and/or maintained in Masailand to make it physically possible to move offtake in an orderly manner. While the National Marketing Plan, if and when implemented, would provide some of these services, it is important that this not be overlooked by the Range Management Staff in their overall range development plans. In the event that a National Marketing Plan is unduly delayed, it is suggested that efforts be made with the view of encouraging association members to undertake part of the required work and cost on a cooperative basis.

c. Encourage Cooperative Marketing Within Ranching Associations

It should be recognized that the traditional marketing system that evolved in connection with extracting offtake from scattered nomadic and disorganized subsistence herds is reasonably effective, and nearly impossible to replace with a more efficient system, unless production patterns are simultaneously changed.

Thus, with organized producers akin to the present Ranching Association membership, cooperative marketing is possible and would permit sale more directly to the consumer, effectively circumventing the need of itinerant bush buyers, and place the producers in a better bargaining position. It will probably be expedient to integrate needed local marketing committees into those formed in connection with other aspects of production and grazing management at the level of grazing blocks within ranching associations.

d. Formalize Contracts For Pooled Offtake

Contacts should be made with prospective buyers with the view of selling pooled offtake by formal contract to the extent possible. This approach should contribute to an orderly and sustained offtake by assuring the highest possible return to producers as an incentive to sell. However in the final analysis, offtake cattle should go the best market available at any given time and place, the foregoing notwithstanding.

e. Establish and Follow Analytical Procedures in Collecting Needed Statistical Data

Continuous surveillance of livestock inventories and herd composition must be maintained to establish optimum stocking levels and identify prospective animal for offtake. The number of animals passing through dips is presently being recorded and limited herd composition data have been collected on some Range Associations. It is suggested that the present procedure of recording number of immersions at each association dip be continued, but in addition a standard classification form should be developed to meet the requirements of all project technical sections. Marketing records would require the following minimal data on cattle:

FEMALES		MALES		Nursing Calves	Market Age Steers
Cows	Heifers	Bulls	Immature		

When a standardized recording form is agreed upon by the project staff concerned, it should be printed and used some three times annually for a full week at each association dip to classify all animals passing therethrough.

This information (plus additions suggested by other project staff) would provide bench mark data for stocking levels, prospective offtake identification and other reproductive/productive assessments. Hence, it should be collected in a central office for tabulation, and analysis. Because of their importance to the project and the ease with which they can be computerized, consideration might well be given to arranging time on a small computer reportedly available in Dar es Salaam to handle these data. If this were possible, it would probably require a short-term consultant on the NEF team to work out operational procedures.

The following table and associated graph of dynamic parameters in a constant sized cattle population at different effective calving rates and/or varying levels of commercializations have been assembled over the years and made available to the NEF team. These data are useful when making projections relative to possible offtake and also helpful in drawing conclusion on herd composition and industry status from information taken in the market place, especially by age and sex.

f. Promote the Establishment of Consumer Cooperative Shops to Service Association Members

There is some risk in encouraging and assisting the Masai to produce and market more and better cattle unless constructive wants can be generated and satisfied, thereby bringing him into a cash economy. To this end provisions should be made to provide ready access to at least selected consumer goods, starting perhaps with already appreciated livestock production orientated supplies (e.g., medicines).

g. Facilitate Credit to the Associations According to Established Need

In attempting to develop Masailand, it is impossible and undesirable for Government to provide all of the costs. Thus, to the extent possible, credit should be provided which would facilitate the development of Masailand by the Masai themselves on a cooperative basis.

h. Note is made of the desirability of the collection and dissemination of market news intelligence in respect of Agricultural Marketing in general and livestock in particular, and that while a market news service is not specifically included among the services to be provided by the proposed parastatal marketing company, some such provision is needed in furtherance of project marketing.

3. Summary

A sustained economic offtake of cattle in conformity with realistically established stocking levels, is one of the more important prerequisites to success in the Masai project. A rational, national marketing policy leading to realistic market infrastructure improvement to facilitate an orderly flow of cattle to the point of slaughter, including Masai offtake, is a project support requirement. No serious reservations are held with respect to the Masai's willingness to sell surplus cattle providing there is reasonable price incentive and efforts are made to create and supply consumer wants. Thus, appropriate recommendations have been made to bring the Masai into the nation's cash economy. The rising demand for beef in Tanzania, and throughout Africa in general, bodes well for the socio-economic future of the Masai project.

PARAMETERS IN A CONSTANT SIZED CATTLE
POPULATION WITH DIFFERENT EFFECTIVE CALVING RATES

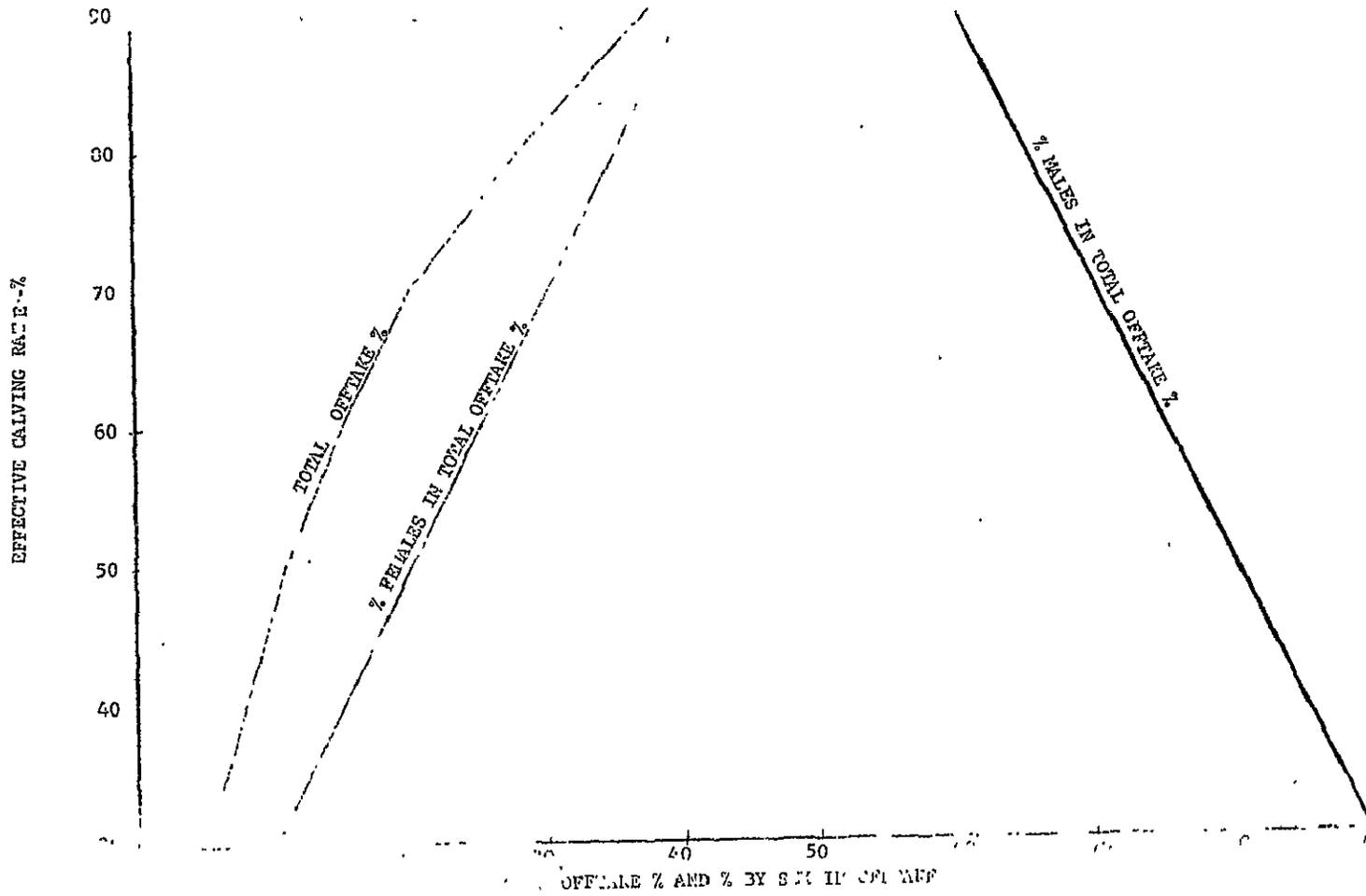
EFFECTIVE CALVING RATE-%	GENERATION INTERVAL (YEARS)	AGE AT FIRST CALVING (YEARS)	% OFFSPRING REPRODUCED AT BREEDING REPLACEMENT		TOTAL OFFTAKE %	% OF TOTAL OFFTAKE BY SEX AND RELATIVE AGE					
			MALE	FEMALE		MALE			FEMALE		
						YOUNG	OLDER	TOTAL	YOUNG	OLDER	TOTAL
90	4.5	3	3.5	48	38	58	2	60	30	10	40
80	5.0	3.5	4.0	53	28	42	23	65	15	20	35
70	5.5	3.75	4.5	60	20	30	40	70	9	21	30
60	6.0	4.0	5.0	70	15	18	57	75	5	20	25
50	6.5	4.25	6.0	80	11	11	69	80	2	18	20
40	7.0	4.5	8.0	90	8	5	80	85	1	14	15
30	7.5	4.75	12.0	100	5	0	90	90	0	10	10

Notes:

1. Effective calving rate is calf drop minus calfhood mortality.
2. Generation interval in years is the average age of the cows when their offspring are born.
3. Total offtake % is based on total herd number.

EXPECTED ANNUAL OFFTAKE % AND OFFTAKE SEX RATIO IN A CONSTANT-SIZED CATTLE POPULATION AT

VARIOUS EFFECTIVE CALVING RATES



PART V ADMINISTRATION AND LOGISTICAL SUPPORT

During the field visits of this evaluation study certain problems of particular concern to the NEF team in this area were brought to our attention and are noted here.

As already shown in PAR 73-1, the NEF team has had great difficulty with staff and project vehicles of U.S. origin on the rough terrain of project operations. Spare parts and maintenance are a continuous cause for concern. For the present, USAID has arranged a sufficient number of vehicles in good working order for the current team but questions of replacement or additions for new NEF staff will arise in the future. It is suggested that USAID advise USAID further on this subject at the appropriate time.

NEF also seeks help with drivers. Currently, GOT requires a driver at all times for GOT-owned vehicles under project operation. NEF technicians believe their extensive travel arrangements could be considerably facilitated if the driver could be excused from service when several NEF members are making lengthy journeys in the same vehicle. This would seem to simplify substantially luggage handling, overnight stops and similar logistics. NEF is informed that certain other donor technicians have been able to obtain authorization to drive their own vehicles when travelling in performance of prescribed duties. USAID/Dar es Salaam is requested to review this matter with appropriate GOT officials.

The project office at Monduli is handicapped by lack of office personnel and asks consideration of USAID assistance in arranging for a competent typist and also, if possible, an office manager. USAID is requested to review his request.

During our short visit we were in close contact with the newly assigned Project Manager, who expects henceforth to be in close touch with the NEF staff and related project operations. No doubt many of these logistic questions will be satisfactorily resolved in the near future.

ANNEX A

FRAME OF REFERENCE
Suggested Content of Report

The evaluation team will investigate and report on the following:

1. Suitability of project objectives, goals, and targets.
2. Suitability of project implementation methods being used to achieve objectives, goals, and targets.
3. Progress being made in establishing ranching associations.
4. Progress made in establishment of physical improvements.
5. Progress made in improvement of marketing.
6. Progress made in water development.
7. Progress made in range improvement.
8. Progress made in disease and parasite control.
9. General livestock marketing situation in Tanzania as it affects market operations of the project.
10. General livestock disease situation in Tanzania as it affects project operations.
11. Qualifications and effectiveness of AID - supplied technicians assigned to the project.
12. Adequacy and effectiveness of Mission project management, including backstopping of AID-supplied technicians.
13. Adequacy of AID and TanGov commodity support for the project.
14. Adequacy of AID and TanGov training support for the project.
15. Adequacy of TanGov personnel, legislative, administrative and funding support for the project.
16. Recommendations for future conduct of the project. The recommendations will state whether the project is to be continued or discontinued. If continued, the recommendations will state recommended emphasis levels of AID and TanGov inputs and whether the project should be expanded, curtailed, or continued at about the same level. If the project is recommended for continuation the team will also make recommendations for changes and improvements in implementation, if it finds changes and improvements needed.

ANNEX B

PAR 73-1 is herein included as Annex B of this
Evaluation Report.

ANNEX C
1
LOGICAL FRAMEWORK MATRIX

Project Title: Masai Development Project

(Project 093)

NARRATIVE SUMMARY	OBJECTIVE VERIFIABLE INDICATORS
<p><u>Director Goal:</u></p> <p>To obtain the highest national beef production possible with environmental conservation and improvement. Increased production and offtake will permit higher per capita protein consumption along with greater foreign exchange earning from exports.</p>	<p><u>Measures of Goal Achievement:</u></p> <ol style="list-style-type: none">1. Annual herd offtake % increased from 7% in 1970 to 12% in 1980 on fully activated R.A.'s.2. Average slaughter steer live weight increases from 550 pounds in 1970 to 650 in 1980.
<p><u>Project Purposes</u></p> <p>To reach a sustained high level of offtake in the Masai District consistent with proper land use, resource management and Tanzanian social and economic development goals.</p>	<p><u>Conditions that will indicate purpose has been achieved:</u> End of project status.</p> <ol style="list-style-type: none">1. Eight R.A.'s will have annual average offtake of 12% or more.2. Thirteen other R.A.'s will be in various stages of development toward the objective of 12% offtake or better.3. Calf drop rises from 50% in 1970 to 60% in 1980.4. Calf mortality reduced from 35% in 1970 to 20% in 1980.5. Weaning rate increases from 35% in 1970 to 50% in 1980.6. Average age of slaughter steers at market weight reduced from six years in 1970 to four in 1980.7. Average age of Females at first calf reduced from five years in 1970 to four in 1980.
<p><u>Improvements on Association Areas:</u></p> <p><u>Outputs:</u></p> <ol style="list-style-type: none">1. <u>Rights of Occupancy</u> - security of land tenure.2. <u>Management and Coordination of Associations through Ujamaa Centers:</u><ol style="list-style-type: none">a) Basic management of market oriented RA's.b) Managed program of innovations.3. <u>Disease Control:</u> Tick dipping and Dawa (medicine) used.4. <u>Water Development and Distribution:</u>5. <u>Livestock Improvement:</u>6. <u>Marketing:</u><ol style="list-style-type: none">a) Efficient marketing organization.b) Masai sell surplus animals.7. Range Management - stocking quotas and rotational grazing protect range from overgrazing.8. Providing extension services for livestock improvement.	<p><u>Magnitude of Outputs:</u></p> <ol style="list-style-type: none">1. 21 RAs registered with rights of occupancy.2. a) RAs sub-divided into units. b) Each RA sub-division has (management) plan. c) RAs have resident field officer with transport.3. RAs dip all animals on regular schedule.4. RAs have 60% of mgt. unit covered with permanent water for dry season use; 40% of mgt. unit covered with temporarily water for wet season use.5. Broad acceptance of breeding and managements practices, i.e. improved bulls, castration, selection, disease treatment and control.6. Evident sales of marketable surplus.7. RAs complying to stocking rates adjusted to annual range condition studies.8. Masai acceptance of extension staff advice.

ANNEX C

Project Title: Masai Development Project (Project 093)

MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<u>Sector Goal:</u>	
1. Offtake identified by analysis of dipping tank records, herd composition sample surveys, and other available data. 2. Available sales records.	1. Other Livestock programs in Tanzania will further increase national off-take and improve the marketing infrastructure. 2. General economic development, increasing human population, urbanization and mounting demand for beef will combine to assure good prices in future.
<u>Project Purpose:</u>	
Committee sales records, Analyses of dipping records, routine RA data, herd composition sample surveys, Veterinary Dept. statistics, and other available data. (Applies to conditions 1-7).	1. Disease control measures, better ranges and more available water supplies leading to improved productivity, will remove the felt need by the Masai to maintain surplus animals as a hedge against disease outbreaks and the perils of draught, and encourage economic off-take levels. 2. The demand for cash by the Masai can be enhanced by making selected consumer goods more readily available through cooperative shops (e.g.; stocks of supplies, etc.), and by providing development orientated credit on a cooperative basis. 3. Removing the need for maintaining excessive numbers of surplus animals as a hedge against death losses with an increasing demand for cash should bring the Masai into a cash economy.
<u>Outputs:</u>	
1. Range Comm. registration records 2. Project progress reports 3. " " " 4. " " " 5. " " " 6. " " " 7. " " " 8. " " "	1. R.A.'s will develop sufficient self interest and stake in investment to effectively exclude outside cultivators and other non-members. 2. G.O.T. will vigorously enforce rights of occupancy and assist RAs to resist outside encroachment.

ANNEX D

GUIDE TO RANGE DEVELOPMENT AND MANAGEMENT

Six copies of Annex D were made available in Dar es Salaam. One copy has been transmitted to the NEF, and one will be sent to AID/W. The remaining will be filed at USAID and distributed as needed. Additional copies will be reproduced if required. ~~Additional~~

PD-AAQ-665

EVALUATION REPORT

HASAI RANGE MANAGEMENT

AND

LIVESTOCK DEVELOPMENT PROJECT

February 4, 1973

USAID/DAR ES SALAAM
United Republic of Tanzania
U.S. Agency for International Development

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MASAI LIVESTOCK AND RANGE MANAGEMENT PROJECT

EVALUATION REPORT

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D - Guide to Range Management and Development in Africa	

PART I. INTRODUCTION

This Evaluation Report was prepared by a four-man team from the Agency for International Development in Washington in accordance with the original AID funding authorization of December 2, 1969 which stipulated that a special in-depth evaluation be conducted when the project had been in operation about two years. The contract with the Near East Foundation (NEF) as project action agent was executed in February, 1970 and the first NEF OPEX contract technicians arrived in Tanzania in June, 1967, 1970.

The evaluation study was conducted during the three-week period January 13-February 3, 1973; prior to departure from Washington the team attended a briefing on the project's history and status by staff members of the Office of East and South African Affairs (AFR/ESA) and the Office of Development Services (AFR/ODS) of AID's Bureau for Africa.

During its stay in Tanzania the team, accompanied by USAID representatives, NEF and Tanzanian project staff members, made field visits to four ranching associations in Kijungu (Talamai), Ngorongoro (Korongoro), Kibaya (Konyo kio), and Monduli (Komolonik) in the Masai District and held discussions at these sites with officials of either ranching associations or Government Veterinary and Livestock Departments. Interviews were held with Tanzanian National, Regional, and District Development directors (or officers) in Dar es Salaam, Arusha and Monduli and the major recommendations were discussed there in detail. However, this final version of the Evaluation Report is the responsibility of the AID Evaluation Team only.

A PAR 73-1 and revised Logical Framework Matrix were included in this report as Annexes and also submitted separately to AID/W in accordance with the agency's management system procedures.

The team expresses its sincere appreciation to Government of Tanzania officials, USAID/Dar es Salaam and NEF for the very warm hospitality and excellent cooperation extended in the conduct of this evaluation.

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PART II SUMMARY RECOMMENDATIONS

A. Goal, Purpose, Targets

✓ 1. Revised Sector Goal is:

To obtain the highest national beef production possible with environmental conservation and improvement. Increased production and offtake will permit higher per capita protein consumption along with greater foreign exchange earnings from ~~exports~~ exports.

✓ 2. Revised Project Purpose is:

To reach a sustained high level of offtake in the Masai District consistent with proper land use, resource management and Tanzanian social and economic development goals.

✓ 3. Revised Conditions Indicating Purpose Achieved (EOPS)

- a) Eight RAs will have annual average offtake of 12% or more.
- b) Thirteen other RAs will be in various stages of development toward objective of 12% offtake or better.

B. Revised Project Implementation Plan

1. RA Management and Development Planning

New project implementation plan envisages complete, detailed range management and development plans on a sequential basis for the four most promising RAs in about 2 years: all existing RAs to be completed about 1975; and preliminary planning for registering desired new Associations in Masai District by 1980. Water installations would roughly follow same sequence as range management plans but the order might be modified somewhat to obtain the most efficient combination of available GOT local budgets, counterparts, personnel training and equipment utilization.

2. Land Use Classification

Recommend deletion previously proposed Water and Land Use Survey and instead a Land Use Classification for the Arusha Region by a study group under 211-d which would help GOT strengthen its land policies and prevent cropping on land capable only of grazing. Independent study group would begin work in Masai District where NEF team would be responsible for detailed site and condition classification on the Masai areas determined to be range land. After completing the Masai District, the study group would proceed to the remaining Districts of Arusha, about 20% of the Region, for a more detailed land use survey with particular emphasis on crop production.

3. Water Development

Water investigations and installations, in accordance with RA development planning, will be directed by the NEF Surfacewater Engineer and the Groundwater Hydrologist, recommended as an addition to the NEF team, utilizing mainly the equipment provided under the current and prospective agricultural support loans. A maximum of surface water exploitation is planned for this equipment. Groundwater should be developed only where essential. All water development should be completed as planned at each respective RA before the equipment is transferred.

C. Proposed Expansion of Project Inputs:

1. Staffing:

a) Recommend three new NEF OPEX positions: Groundwater Hydrologist, Veterinarian and Heavy Equipment Specialist.

b) Following TDY or consultant assistance is also envisioned: Senior Range Management Advisor, Groundwater Geologist, Agricultural Economist, Data Processing Expert, Audio-visual Aids Technician, and perhaps others at a later date.

2. Training:

Participant and on-the-job training is to be expanded to provide counterparts for all NEF technician and for participation in the preparation and implementation of the RA management and development planning for each selected RA grazing unit.

3. Loan Components:

a) Under the contemplated 2nd Agricultural Support Loan, USAID should prepare commodity lists for about 1.2 million in equipment needed for project water and related development. This new figure includes some items previously expected as grant under the Water and Land Use Survey and certain additional items to permit two water teams to operate closely under central direction and logistical support.

b) Under the contemplated Agricultural Credit Loan, loans should be extended to various RAs to help finance ranch and water development as well as project operation and maintenance costs.

D. Range Management

1. Subdivide ranching associations to manageable units with grazing units subdivided into five paddocks.

2. Develop plans for each management unit.

3. Collect and record data on systematic basis as part of management plan.

4. Design and implement training program and range handbook for GOF range and other project personnel with provision for additional participant training.

5. Association/Paddock boundaries. cleared to serve as access road and firebreaks and define enclosures for farming.

6. Plan credit sources and assessment schedule of association members to pay development, operation and maintenance costs.

Animal Production And Disease

1. Recruit and assign Animal Production Specialist, provide additional position of Animal Health Specialist.

2. Collect and record data on herd composition.

3. Develop standard of selection, design upgrading and improved animal husbandry management plans.

4. Develop management plan for better utilization of Ardal station.

5. Design and implement program to identify; internal parasites; endemic Foot and Mouth disease areas; prophylactic and therapeutic disease program.

Marketing

1. Organize markets with supporting services and physical facilities.
2. Encourage cooperative marketing units with local marketing committees and Associations.
3. Collect data to determine livestock numbers, and composition. Data will establish basis to determine offtake.
4. Develop information and contacts with buyers for marketing associations.
5. Promote consumer shops to service Association members.
6. Facilitate credit arrangement to meet development and production requirements.
7. Provisions needed for market news intelligence.

G. Other

1. Standardized data collection procedures should be initiated for the project.
2. Collected Data should be centrally processed, possible by mini-computer.
3. In order to determine the gradual phase - out, extension, or termination of this project, another in-depth evaluation should be conducted in early FY 1978, including cost/benefit analysis, and other relevant issues to be determined at that time.

PART III OVERALL EVALUATION

A. REVIEW OF PROGRESS MADE TOWARD GOAL, PURPOSE AND TARGETS

1. PAR 73-1

As requested in the USAID proposal outlining the frame of reference for this Evaluation Report, PAR 73-1 has been prepared and together with revised Logical Framework Matrix, included as Annex ~~2~~⁶. The actual PAR 73-1 was based upon the original project documents, ProAg, PROP, and PIP, and, of course, the key performance indicators of these original documents. However, we have shown also in Annex ~~2~~⁶ a listing of the revised performance indicators and other suggested changes in the PAR format conforming to the corresponding items in the revised Logical Framework Matrix, or LogFrame as abbreviated. (Annex C)

Since, the PAR is a regular feature of AID's management system, we are also transmitting to AID/W, in the normally prescribed manner, copies of both PAR 73-1 and the LogFrame with appropriate references to the further details shown in the complete Evaluation Report.

2. Performance Indicators

a. Inputs

As detailed in Part II of PAR 73-1, the NEF contract group of six OPEX technicians after serious personnel difficulties in the early years, now shows evidence of being a competent, well-unified team unusually familiar with the local cultural (milieu) setting. While overall performance has been noted satisfactory, the deficiencies in Range Management have resulted in significant lags in certain key outputs. Therefore the Evaluation Report contains a series of comprehensive recommendations which figure significantly in the proposed new project strategy and on the future project planning and implementation schedules.

There have also been lags or deficiencies on project commodities under both AID grant and loan funding but USAID recently completed actions to resolve them. In connection with the delivery of heavy well-drilling equipment now scheduled June 1973, this report includes recommendations for one additional NEF technician and corresponding counterpart and manpower training inputs.

The participant training program is on schedule and the Tanzanian Government (GOT) has provided even more counterpart personnel to NEF OPEX technicians than originally planned or anticipated. GOT has provided funds promptly for infrastructure installations and has also extended disease programs and water development efforts into non-project areas not yet included in Ranching Associations.

b. Outputs

The overall performance against output targets has been generally good but there are some weak points. Eight R.A.s have been registered and keen interest shown for 3 new ones; rights of occupancy is lagging on six R.A.s but this has not actually restrained operations. Masai willingness to cooperate has exceeded ability of technical staff to implement. Water supplies and dipping tanks have been installed and at least 75% of the herds are being dipped in each of four R.A.s. On 3 R.A.s there is already 40% water coverage on dry grazing areas.

In 2 R.A.s, trials with improved bulls have begun and the herdsmen response has been favorable despite early losses of some bulls. Several Marketing committees have been formed with another in process and special markets have been arranged with positive results.

A serious lag has occurred in range management and grazing planning, thus practically nothing has been done to promote systematic management and coordination; therefore a series of specific recommendations on

future actions is included in this Evaluation Report.

3. Project Production Targets

Although this project's Sector Goal and Project Purpose have in the past been modified slightly, the measure of achievement has clearly been the concept of an increase in physical livestock production in the areas of project operations. The indicator chosen was the annual average cattle offtake, estimated at 7% in the base year FY 1970, and the target set at 15% for FY 1980.

Statistics and factual data on livestock in the country are still fragmentary and it has not yet been possible to obtain direct evidence of the levels of offtake or naturally, the annual changes in offtake. There are available estimates of total cattle population largely based upon projections from census data taken in 1954 and 1965 and annual offtake figures are variously estimated from animals marketed through official channels and hide export figures.

In making analyses of the available data, the Evaluation Team was able to apply certain refinements by using tables of dynamic parameters in a constant sized cattle population at different effective calving rates and/or varying levels of commercialization. These parameters have been assembled from various sources over the years and are shown in a table and graph form at the end of the section on "Marketing" in Part IV C of this report. These data are particularly useful when making projections on possible offtake and in drawing conclusions on herd composition and industry status from information taken in the market place, especially on slaughter animals by age and sex.

Using the methodology outlined or described above, the Team has confirmed 7% offtake as the base line for FY 1970 and has lowered the target figure in FY 1980 from 15% to 12%. Taking account of the normal cattle reproductive cycle and the corresponding amount of time necessary for cumulative changes in basic factors such as calf weaning and calf mortality to be reflected in increased cattle numbers and offtake, the 12% target is judged to be more realistic for purposes of this project and compared to the 7% of FY 1970 represents almost a doubling of the average annual rate.

The team believes that NEF's use of this analytical tool applied to available data, along with additional sample surveys at RA dipping vats as recommended in the Marketing section, will yield more satisfactory estimates for national livestock but particularly for the project Ranching Associations.

It is recommended that NEF makes continuous efforts to compile necessary data and to refine the necessary estimates of offtake and other key parameters.

4. Revised Statements of Goal and Purpose

a. Sector Goal

To obtain the highest national beef production possible with environmental conservation and improvement. Increased production and offtake will permit higher per capita protein consumption along with greater foreign exchange earnings from exports.

This is only a slight revision from the previous version and merely specifies the COT policy interest in expanding national livestock production in order to increase both foreign exchange earnings and per capita consumption.

b. Project Purpose

To reach a sustained high level of offtake in the Masai District consistent with proper land use, resource management and Tanzanian social and economic development goals.

The reference to GOT goals was inserted in the formulation after lengthy discussions with national, regional and district officials and reflects the strength of GOT's current emphasis at the local level on the provision of social services, e.g., schools, clinics, housing, etc. It is understood that this project is directed toward the socio-economic aspects of livestock production and development but these GOT officials are responsible for all developmental activities and the need for close coordination becomes more urgent. For example, GOT officials wish that RA boundaries confirm as nearly as possible to the Ward or basic political/administrations unit in Masailand. Also, the management plans for the individual grazing units should take account of the planning of various Government departments for schools, clinics, etc., and GOT for its part should be well informed of project planning and operation requirements.

Under the new GOT reorganization the Masai Project is under the direction of the District Development Director and more specifically the District Livestock Officer, particularly for technical matters. Nevertheless, some problems may arise in the future and we suggest that USAID Project Managers keep a close watch on this matter.

B. VALIDITY OF PROJECT DESIGN

Having reviewed the documentation on the history and background of the project, visited field sites, discussed details with USAID, NEF project staff, and GOT national, regional, and district officials, and prepared PAR 73-1, the evaluation team has concluded that the project design is valid. This judgment is conditioned by the team's knowledge and experience in the field of animal agriculture and comparison with similar types of livestock development undertakings in other parts of Africa.

The project operates in a clearly defined, relatively insulated, homogeneous geographic area having a generally favorable climate and an extensive but protected vegetative natural resource base, not as yet unduly subject to the pressures of human or animal population; there is, therefore, a demonstrable potential for increased production and animal agricultural development.

With initial personnel difficulties now remedied, the NEF technicians currently in the field are enthusiastic, energetic, dedicated and would constitute an integrated, complete multi-disciplinary group, with the inclusion of the Animal Health Specialist, Groundwater Hydrologist and Heavy Equipment Specialist proposed in Part IV of this report and particularly the Sociologist/Extension Specialist who, already within a few months since his arrival, is exercising an extremely active role in project activities over a wide-ranging area in the District.

The GOT has provided strong leadership and support for the project in manpower training, counterpart personnel, materials, and infrastructure funding. Under the recent broad government reorganization, executive responsibility for this project is now at the Regional and District levels, much closer to the local situation, which reinforces GOT support for the whole undertaking. Adding further impetus is the recent selection of the Masai District for priority development within the Arusha Region.

In its concern for equitable returns and benefits to the small holders, low income rural Masai herdsmen, the project is consistent with AID's current program emphasis and GOT's increasing concentration on social welfare for rural peoples through the "Ujamaa" concept of nationwide, cooperative, self-help organization at the village level, rooted in traditional African culture and family structure. Furthermore, this on-going project is integrally related to a major, large scale beef development scheme which the GOT National Government has already initiated with IDA loan financing and based upon a comprehensive 1971, IDA Sector Analysis for Livestock.

The essential feature of the original project plan of action was the early installation of combined water and dip facilities in order to obtain some immediate short-term acceptance of new ideas and change because of short-term

improvement in the Masai environment rather than the promise of benefits to accrue in the future. The efficacy of this approach seems well borne out by the progress made in the first two years of operation. Although dipping vats had existed in some parts of Masailand for many years at the outset of the project, many Masai herdsmen remained skeptical of their value and the advisability of joining R.A.'s to take advantage of improved Animal Health through their use. But the actual responses to the project's demonstration effect more than exceeded expectations.

Cattlemen were immediately aware of declining calf mortality resulting from the control of East Coast Fever through dipping. Various R.A.'s have been pressing for additional dipping facilities and numerous initiatives are under way to organize more R.A.'s. Generally Masai's willingness to join the program is exceeding the current staff and material resources for implementation. Three R.A.'s have already raised their own investment funds for replicating these development facilities. With its priority concern under "Ujamaa" for organizing cooperatives at the village level, GOT both nationally and regionally, is anxious to expand the number of these cooperative ranching associations as rapidly as manpower and other resources will permit.

It is mainly the phenomenon of East Coast Fever, effectively controlled by dipping to reduce tick infestation, together with a somewhat more favorable resource base and climate, which determines the relatively higher potential for increasing livestock production in Masailand compared to many other regions in East -, West - and Central Africa.

C. REVISED PROJECT IMPLEMENTATION PLAN

The essential ingredient of this revision is a series of complete R.A. Range Management and Development Plans which is outlined in Part II, Summary Recommendations and set forth in detail in Part IV, A - Range Management. This planning on a sequential basis for the four most promising R.A.'s should be completed in about two years; all 8 existing R.A.'s completed about 1975-76 and the preliminary planning for registering the desired number of new Associations in Masai District by 1980. Water installations and other planned operations would roughly follow in the various R.A.'s in the same sequence as the range management plans, but the order might be modified somewhat to obtain the most efficient combination of available GOT local budgets, counterparts personnel training and equipment utilization. If the training schedule is satisfactorily met, a separate GOT staff planning team might be split off in early 1975 to initiate the registration process for the new R.A.S.'s.

This evaluation recommends the deletion of the previously proposed Water and Land Use Survey and instead the organization of a Land Use Classification for the Arusha Region by an independent group under 211-d, perhaps the University of Hawaii. We believe such a study would strengthen the GOT position in formulating and enforcing its land use policies and also help prevent cropping on land capable only of grazing. The independent study plan would begin its work in the Masai District where the NEF team would be responsible for the detailed site and condition classification on the Masai areas determined to be rangeland. As presently constituted, the NEF has the competence for range classification but not soils classification which expertise hopefully would be provided by the independent study group.

After completing the Masai District, the study group would proceed to the remaining Districts of Arusha, about 20% of the total Region, for a detailed land use survey with particular emphasis on crop production. However, the NEF team would have no further involvement beyond the Masai District.

The water investigations and installations to be performed in accordance with the detailed R.A. development planning will be directed by the NEF Surfacewater Engineer and the Groundwater Hydrologist who is being recommended as an addition to the NEF team. The necessary equipment is expected under current and prospective agricultural support loans. The new second loan now estimated at \$1.2 million, reflects the inclusion of some items previously

expected under the Water Survey grant and certain additional items needed to permit two water teams to operate in close contact under central direction and logistical support. USAID should complete the commodity lists for the proposed loan and should seek TDY assistance if needed for the preparation of specifications.

As noted above the water development should roughly follow the same sequence as the range management plans and all planned work should be completed at each respective RA before the equipment is transferred. A maximum of surfacewater exploitation is planned with this equipment; groundwater should be developed only where essential.

C. PROPOSED EXPANSION OF PROJECT INPUTS

1. Staffing

a) NEF Staff

The following three additions are proposed for the NEF team: Groundwater Hydrologist, Veterinarian and Heavy Equipment Specialist. The detailed requirements and proposed function of these staff are summarized in Part II and explained further in Part IV.

b) TDY Assistance

The current Range Management Specialist is young, energetic and competent, but lacks experience in Africa in the formulation of comprehensive range management and development plans. We therefore, recommend the services of a Senior Range Management advisor for a period of about six to eight weeks to assist the NEF technician in organizing, at the first RA, the required planning undertaking. The efforts at the first 1 or 2 RAs in the proposed implementation plan, because they will serve as on-the-job training exercises for the combined project team of NEF technicians and GOF project staff. Copies of Annex D of this report, Guide to Range Management in Africa, have already been made available to NEF at Arusha and USAID/Dar es Salaam.

Listed below are the additional TDY services currently envisioned. Other needs may arise at a later date. Details are explained in Part IV.

1. Agricultural Economist
2. Groundwater Hydrogeologist
3. Data Processing Consultant
4. Audio-Visual Aids Specialist

Training:

Participant and on-the-job training is to be expanded to provide counterparts for all NEF technicians and to participate in the preparation and implementation of the RA management and development planning for each sub-divided RA grazing unit.

Loan Components:

Under the contemplated second agricultural support loan, USAID should complete commodity lists and specifications for about 1.2 million in equipment needed for project water and related development. This includes action items needed to permit two operating teams in the field in close contact under central logistical support.

Under the expected agricultural credit loan, RAs will hopefully have a source of credit for financing planned ranching development as well as operation and maintenance costs.

PART IV. REVIEW OF MAJOR LIVESTOCK DEVELOPMENT COMPONENTS

A. RANGE DEVELOPMENT AND MANAGEMENT

1. Observations

The Range Management portion of the project is in an infant stage and little has been done in developing management plans for the eight associations which have been registered to date.

Some development of water and dips has taken place without development plans for implementing the grazing system. These may or may not be located properly when a management plan is developed. Also quantities of water provided may not equal requirements.

Ranching associations are not adequately demarcated and some encroachment of cultivators is occurring. Also cultivation within the associations is occurring on land that may not be suited to crop production on a continuous basis. Farming should be discouraged on all areas not suited to crop production.

Masailand lends itself to development of extensive management units which would be economically viable. The presently registered associations, which average about 300,000 acres each are still too large to manage as one grazing unit and should be subdivided, for purposes of management, into units of 100,000 to 150,000 acres each. Each individual management unit should be subdivided into a five-paddock grazing system which will allow a three-month rotational grazing pattern with the fifth paddock reserved as emergency forage in draught years and as a means of controlling bush encroachment through controlled burning. Boundaries and subdivisions should be cleared and maintained annually to serve as boundaries for grazing animals, firebreaks, and access roads.

The units should be mapped from available aerial photograph mosaics which would record range site and condition, existing and planned structural development, proposed subdivisions, and season of use (wet or dry season) for the subdivisions.

Members grazing livestock on the unit should have their animal numbers recorded and assigned that percentage of the total herd that their animals constitute in order to determine their responsibility for repayment of future development loans, annual operation and maintenance costs. Also, this should be used as a measure of his allowable increase or required decrease in future numbers of livestock.

Forage inventories should be used as an initial estimate of proper stocking rate with annual inventories to determine adjustments necessary in numbers of animals to balance available forage with number of animals.

Water development should be planned to implement the grazing system. Quantities of water required, at what season of the year and the desirable location should be stated in the management plan. Distribution of water points from which animals graze within a 3.5 to 4 miles radius, should be used as a basis for balancing water required with available forage for livestock. The most economical sources of water such as surface storage should be investigated before developing sources with high annual operation and maintenance costs, e.g., pumped bore holes, or extensive pipelines from streams and springs.

Dip locations should be planned for use by two or more of the grazing paddocks. The design already being utilized is good and effective use is being made of existing dips by livestock owners. Cattle are relatively free of ticks and tick borne diseases have been brought under control where animals are dipped regularly. Caution should be taken to insure dip strength is kept at required levels.

Permanent line transects with photo grid plots should be established as a means of recording vegetations' trends over long periods of time. Also rain gauges should be placed on each association to determine annual rainfall.

The Tanzania Range Act of 1964 is quite adequate to form ranching associations with the legal right to the area adjudicated and to obtain credit from available sources for further development.

Credit for development, operation and maintenance cost should be considered as an appropriate means for more rapid development of the livestock industry in Masailand. Such development is economically feasible and the burden of repayment should be placed on the beneficiaries rather than on Government. Operation and maintenance costs should also be assumed by the livestock owners rather than by Government.

The NEF Range Management Advisor should develop a handbook setting out jobs to be done each year on the grazing association with instructions as to how to perform the job and charts for recording data gathered. This data should be recorded as a long-term record of production under known circumstances.

The rate of planning and development will largely depend upon how fast the Tanzanian Government can provide counterparts for on-the-job training and participants for additional academic training. The majority of the data required for planning and development purposes will be gathered by trained Tanzanians, from which the team can formulate management and development plans.

There are requirements for additional personnel on the team to fill disciplines which are missing from an integrated approach. Animal health is provided by the Government Veterinary Service which is seriously understaffed and poorly equipped. A Veterinarian should be added to the team. Operation and maintenance of the heavy equipment for construction will require the services of a Heavy Equipment Specialist to train operators and mechanics in the efficient operation of machinery and proper maintenance and repair.

The services of a Ground Water Hydrologist will be required for locating proper drilling and equipping of bore holes.

2. Recommendations

a. Present ranching associations are too large to manage as one unit and, therefore, they should be subdivided into management units 100,000 to 150,000 acres in size. Also, the 25,000 acre bull-breeding ranches expected from 2nd loan IBRD should be planned for each of the eight associations.

b. Range management and development plans should be completed for each management unit. Staff should be trained and planning done on one association at a time rather than fragmenting staff over several associations.

c. Data collection should be done on a systematic basis and recorded as a part of the management plan.

Data should include:

Range site and condition map.
 Forage inventory and bush density.
 Estimated annual carrying capacity.
 Census of animal herd with age and sex categories. This data should be recorded for each member of the ranching associations.
 Range trend should be studied through the use of line transects with permanent photo grid plots.
 Rain gauges should be placed on each management unit to record annual precipitation.
 Present water locations with quantity available.

d. Additional participant training in Range Management, Animal Science, Livestock Extension, Veterinary Medicine, Hydrology, Agricultural Engineering (two aspects - surface water development and operation and construction with heavy machinery).

e. Additional positions on the NEF team to include Veterinarian, Heavy Equipment Specialist, and Hydrologist.

f. Grazing management units should be subdivided into five paddocks; management would include rotational grazing on a three-month basis with the fifth paddock held for emergency grazing during drought periods and controlled burning for bush control.

g. Boundaries of Associations, management units and grazing paddocks should be cleared by bulldozer and graded to serve as access roads and firebreaks.

h. Farm land should be cut out as enclaves and boundaries demarcated around them.

i. Develop Range Manager Handbook with jobs to be performed and tables for recording data.

j. Plan possible credit source for range development program.

3. Summary

Although range planning and development are behind schedule at this time, targets can be achieved or even surpassed by a concerted effort on the part of the present team. The speed with which the team proceeds will largely depend upon how many Tanzanian counterparts the team trains to collect and assemble data for planning and development.

Base data is practically nonexistent and should be a major effort on the part of the team to collect sufficient data for future production and marketing intelligence.

Financial requirements for the development and operation of the magnitude the Tanzanian Government envisages will be quite large and probably will require outside financial assistance for the purchase of additional equipment and maintenance and operation costs.

Masailand has large resources in range land, potential water development and livestock which at present are being utilized in an inefficient manner by nomadic cattle producers. The resources can be mobilized to effectively contribute to the national economy and utilize the human resources which are largely subsistent at present. Increased beef production to meet growing local and export demands should be one of Tanzania's major revenue earners in the near future.

A Division within the Ministry of Agriculture with Regional and District Officers to develop range extension, planning and management skills should be established. Major emphasis should be placed on training staff for this division.

B. ANIMAL PRODUCTION AND HEALTH

1. ANIMAL PRODUCTION

a. Observations

Masailand, like other areas in Africa, has no shortage of problems to be solved, if animal agriculture is to develop.

The indigenous shorthorn zebu breed that is predominate in Masai herds lacks genetic capability and capacity for high rates of gain and early maturity that is often envisioned by planners. The genetic limitations are a factor that must be considered when establishing project goals. (The project goals outlined in the current PROP "to increase the average herd size from individual animals weighing 600-800 pounds at 60 months to 1,000 pounds at 30 months; lower the cow's age at first calf from five to three years; increase the calf crop of mature cows from 50 percent to 90 percent annually" are not realistic in terms of achievement due to the breed characteristic and genetic limitations). However, this does not imply that significant improvement cannot be achieved if these animals were provided an opportunity to demonstrate their genetic potential. Masai cattle can be upgraded by the introduction of improved husbandry practices.

A good cross section of cattle were observed during visits to the Association. The large animal population in Masailand provides a base for the selection of animals that could establish a greater uniformity of type for a large scale upgrading program. Standards of selection will have to be established. (This must be developed with Masai herdsmen as they are presently selecting bulls from better milking cows. When questioned they also expressed preference for black or gray cows with a black switch and black pigmentation around the eyes and muzzle).

In the Associations visited there is evidence that calfhoo mortality has declined since inception of the project. This decline is attributable to the regular dipping regime followed by members of the Association. The District Veterinary Officer and members of the NEF attribute this decline in mortality to checking the incidence of East Coast Fever. (East Coast Fever is a highly pathogenic, tick transmitted, protozoan disease of cattle peculiar to areas of East Africa, where the principal vector Rhipicephalus appendicolatus is present¹). Association cattle observed prior to dipping were remarkably free of ticks or skin lesions that might be attributable to blood-sucking parasites.

Nutritional problems (calfhoo and mature cows) are no doubt present, what they are has not been identified with any degree of precision. Calcium and phosphate deficiency in cattle is a problem in most developing countries. Unfortunately, the high load of internal parasites Masai cattle no doubt have masks the manifestations of nutritional diseases. The present management system followed by the Masai is no doubt contributing to the internal parasite problem.

The lack of basic data makes it difficult to establish realistic targets. Herd composition data is required for estimating off-take, calving percentages, mortality rate, grazing rate, developing water facilities and other needs for a rational management plan to develop the Association. (This need for herd composition studies was recognized by Dr. William W. Peek in his End of Tour Report dated 15th February 1972). It is essential that a plan be developed and implemented to secure this data. Without baseline data, it is not possible to measure progress in meaningful terms.

The natural forage resource base and apparent receptivity of Masai livestock growers provides the Government of Tanzania an excellent opportunity to develop animal agriculture in the Masai district.

1

Foreign Animal Diseases, Their Prevention, Diagnosis and Control,
Revised 1964

The rationale for establishing Associations that delineates boundaries by grazing patterns and carefully considers sociological factors to decrease stress within the Masai community is realistic, and, is no doubt, a contributing factor to the apparent confidence the Masai have demonstrated in the Project team. The GOT must build on this modest start by developing an overall plan that sets forth a schedule for registering Associations, work plans, personnel requirements, resource allocations for initial investment, e.g. dips, water points, logistic support and estimated annual recurring costs. The overall development plan should consider the capability and capacity of the GOT to finance and service the development of Masailand. The plan should take into account how the IBRD or other donor proposals might be linked to the development of animal agriculture in Masailand, for example, the 8 ujamaa type breeding ranches currently being considered in the second IBRD Loan Program.

b. Recommendations

The present Near East Foundation (NEF) staffing pattern provides an animal Production Specialist. This position should be filled as soon as possible to:

1. Develop an outline for a breeding and improved animal husbandry management program that will serve as the basis for implementing animal management plans for each association. The management plan should set forth what, where, and when improved practices will be implemented by project personnel with realistic targets of what is to be accomplished. This outline should be developed in collaboration with District livestock, district veterinary, project range, marketing, project veterinary, and sociology specialists and officers of the Association.

2. Initiate plans to secure information concerning herd composition. This data is needed to establish a data base for short- and long-range planning, allocation of resources, grazing requirements, off-take, birth rates, death losses, etc. (The design of method, data composition, and form should be developed jointly -- this will permit the development of a single source form that will serve all project requirements for data -- with Range, Veterinary, Marketing, Sociology and Association Officers).

3. Develop a standard of selection that is needed prior to implementation of an upgrading program. The goals of the upgrading program should consider weight for age, mothering characteristics, fecundity, color and other factors that should be determined in consultation with Masai herdsman, project veterinary and range specialists.

4. Design and initiate training programs in the association for livestock, range and veterinary officers. Modified training programs for association officials should be conducted. The training of association officers should enhance their understanding of project objectives and assist project staff in receiving greater cooperation. Training should be simple and within the capability of GOT technicians and association officers to understand and implement. Training programs for project field staff. Training should be simple and within the capability of GOT technicians and association officers to understand and implement. Training programs for project field staff. Training programs should be phased to provide technology required to implement improved husbandry practices set forth in the annual management plan.

5. Develop a detailed plan for better utilization of Ardal station. The plan should consider upgrading present cowherd. The standard of selection for association cattle should be used to select breeding cows that could form nucleus of breeding herd to produce improved bulls for associations. The possibility of using the station for technical training of association staff should be explored. This training should not displace field training programs that will be carried out in the associations. The design and conduct of training programs should not call for large investment of resources or incur recurring costs greater than presently allocated to this operation.

2. ANIMAL DISEASE

a. Observations

Rinderpest and contagious bovine pleuropneumonia in Masailand has been successfully contained by a Government vaccination program. Based on vaccination records the livestock population in Masailand is estimated at 1 million. The District Veterinary Officer believes statistics on overall livestock numbers in Masai District are fairly good because several careful checks have been made on animals vaccinated and coverage appears to be universally complete.

In discussing other diseases with the District veterinary officer (DVO), it was apparent that anthrax, hemorrhagic septicemia, rabies and a number of arthropodborne protozoan infections are problems in Masailand. He also indicated that there are a number of debilitating diseases that need identification prior to determining distribution, location and their effect on Masai cattle. There is a real need to work closely with animal production personnel to identify and determine nutritional deficiencies.

Present veterinary services of Government are deeply committed to carrying out mass vaccination programs to contain rinderpest and contagious bovine pleuropneumonia. (The Government veterinary services are effective in containing these disease). Foot and mouth disease is endemic in traditional livestock producing areas. Type O, Type A, SAT-1 and SAT-2 occur in Masailand. There is a real need to determine type and to identify endemic areas in Masailand. Present Government policy to maintain a strict control program that requires vaccination and quarantine of trade cattle and quarantine of infected herds is meeting with some success.

The dipping program that is being carried out in the associations is containing East Coast Fever (ECF). The continued success in containing ECF will require better control of the dipping tanks in the associations to assure proper strength of solution and operation of the dip tanks. Data is needed to determine rate of fertility and identification of diseases and causes influencing low fertility rates in Masai herds. This information is not available at this juncture. This basic information and the services of a veterinary officer are not presently available to the project on a continuing basis. The services of a Veterinary Specialist are needed to provide an interdisciplinary approach for planning and implementation of disease control activities in the associations.

Justification for a project veterinarian is based on the limitation of the present government veterinary services in Tanzania because:

- a. Insufficient number of DVMS are available to carry out country-wide prophylactic and therapeutic animal disease programs.
- b. Need for concentrating resources to control rinderpest and CBP.
- c. Insufficient number of senior staff limits provision of diagnostic services to identify diseases, endemic areas and treatment that affect cattle production in Masailand.

out The quality and efficiency of the GOT veterinary services in carrying vaccination campaigns are excellent. The blood testing following the JP-15 rinderpest eradication program showed that the percentage immunity of the population of cattle in Masai district was the highest on the continent. This is indicative that a viable veterinary program is being carried out at present, although it must be recognized that rinderpest is but one of a number of diseases in the Masai district and the control of one disease does not necessarily infer control of all diseases. It does indicate, however that the personnel, resources and experience for control of other diseases are existent.

b. Recommendations

Establish the position of Animal Disease Specialist to be assigned to the NEF staff. This Specialist will be concerned with the identification of disease problems and design of their control within the associations.

NOTE: This specialist is not to be used for the present day-to-day operations conducted by the District Veterinary Office. Vaccination campaigns, control and administration of veterinary personnel, finance of veterinary activities, etc., are to be retained by the officer in charge of the GOT veterinary division.

This Specialist will provide a multi-disciplinary approach that is required to:

1. Develop and overall prophylactic and therapeutic animal disease program for each association, (plan would be developed in coordination and collaboration with animal production, range, and determination of equipment and its utilization in carrying out the plan. Planning should be coordinated with the District Veterinary Office.

2. Initiate plans to identify and classify internal parasites infecting Masai cattle so that treatment may be included in disease management program. Also, identify endemic foot and mouth disease areas within association, and other debilitating diseases effecting Masai cattle. (Present boma management system conducted by the Masai contributes to internal parasite problems. *Cysticercus bovis* is a recognized problem. The identification of other parasites is required for treatment and control that should be included in the management plan).

3. Design and conduct training programs to increase capability of veterinary field personnel assigned to associations. (Training should include testing and control of dipping solutions, data gathering, diagnosis, prophylaxis and therapy of diseases existent in the associations).

3. Summary

The project objectives, goals and targets that are now set forth are realistic and attainable with the development of association plans. The degree of success in achieving project objectives within the present time frame will be dependent on USAID and GOT inputs of technical personnel, administrative and logistic support, initiation of policy or legal changes that may tend to inhibit implementation of association management plans.

The GOT is most fortunate in having a large natural resource base (man, animal, forage) that is essentially untapped. To date this resource base has not been greatly disturbed through multi-use, overpopulation of animals or man. It is a resource base capable of making a sustained contribution providing it is properly managed and not manipulated to meet short-term goals.

The basic infrastructure for veterinary services is in place and efficient albeit short of staff but performing more than adequately to control rinderpest and CBP. There is a need to accelerate training of animal husbandry and veterinary personnel (at all levels to carry out associations management plans as envisioned by the GOT. The implementation methods being used are suitable. This is one of the few AID livestock projects using a multi-disciplinary approach in the key problem area of animal agriculture. The provision of an Animal Disease Specialist and recruitment of the Animal Husbandry Specialist will round out the animal production team to work with the other disciplines.

The general livestock disease (rinderpest, CBP) situation in Tanzania should not impede the development of Masailand. However, there is a need for additional work in animal diseases within Masailand as indicated in B.2 above.

Present resources or proposed new investments should not be made for genetic improvement through artificial insemination schemes. (The project team should not at this juncture divert their effort or attention from cattle to proposals to harvest or control game animals in Masailand).

For future planning (Year 8) purposes the GOT might consider a model that:

A. Allocates range lands and transforms it into TDN for animal feed. (Supplemental feeding could be part of model).

B. Determines how rate of TDN affects animal births and deaths. (Effective calving rate).

C. How availability (levels) of TDN increases rate of maturity, weight for age.

D. Determines qualitative population changes resulting from upgrading and herd composition.

E. Determines how government policies can enter systems through incentive, improved marketing structures, extension, etc.

C. MARKETING

1. National Level

Factual information concerning the National Livestock Industry of Tanzania is both fragmentary and unreliable. Estimates of the total cattle population vary between 10 and 13 million head and are largely based on projections made from census data taken in 1954 and 1965. Annual offtake rates are variously estimated from animals marketed through official channels (313,000 in 1970) and hide export figures which also include salvage from adult mortality (374,000 in 1970). While total herd inventories are estimated to have increased over the years by something in the magnitude of 2.5% annually, it is probable that numbers have about peaked out at present in response to urbanization, population increases and mounting demand generated locally and from the adjoining countries of Kenya, Uganda and Zambia.

The low reproductive/productive coefficients; a calving rate of 55%; a calf mortality and adult mortality of some 30% and 10%, respectively; an average liveweight at slaughter of 250 kg; an average steer age at slaughter of about six years, can be largely attributed to poor nutrition, high disease incidence and a subsistence system of management in which cattle are marketed as a by-product of a way of life with all that this implies.

The national system of cattle marketing is presently in a state of disarray with demand, supply and price information clouded by Government policy which has tended to be consumer orientated and includes measures to by-pass and/or eliminate the old established, traditional marketing infrastructure. District Development Councils operate about 120 permanent primary markets and the Ministry of Agriculture some five secondary types, but all are poorly organized and without adequate physical facilities. The primary producer is rarely the seller in these markets as offered animals have already passed through the hands of one or more bush buyer/traders. This combination of Government control of retail meat prices in some instances, high market fees (8 shillings per head by seller and 5% of sales price by buyer) and veterinary charges (up to 13 shillings per head) have effectively driven much of the cattle trade underground, resulting in meat shortages in many areas, increasing clandestine export of live animals on foot, lessened producer incentives and a declining slaughter weight, all without a significant increase in productive efficiency. In this connection it is of interest to note that the average live weight of animals passing through the TME plant in Dar es Salaam was: 495 pounds in 1950; 545 pounds in 1967; and 475 pounds in 1972.

However, Government has placed high priority on agricultural and rural development in the second five-year plan, and a request has been made to the world bank for a loan in support of upgrading livestock marketing on a nationwide basis. Plans call for establishing a parastatal Marketing Company that would take over all major markets in the country and also serve as order buyers for Tanzania Packers Limited (only operating packing plant in the country and located in Dar es Salaam), MACO Ranches and District Development Corporations. The company would also develop and operate such support services as truck routes, holding grounds and quarantine stations. Cattle sales would be by auction and private buyers would be permitted to participate in bidding. Marketing services would be provided at or near costs without a specific profit motive per se. Among requirements for loan consideration were assurance that controlled retail meat prices would be gradually discontinued.

Apart from maintaining the foregoing basic marketing facilities and services, a new abattoir of 35,000 head annual capacity would be built at Mbeya in the south to kill mainly for chilled beef going to Zambia, but also catering to the local hot meat trade. A similar plant would be established at Shinyanga in the North for shipment of carcasses to Tanzania Packers Limited. This abattoir would also accommodate the local hot meat trade.

Lastly, the TPL plant in Dar es Salaam that was established in 1950, would be completely rebuilt.

It is envisaged that the foregoing marketing company would handle some 50% of the nation's estimated annual slaughter offtake of just over one million head of cattle.

On balance, it would seem that total beef demand is fast outstripping increases in productivity, with the result that no excessive backlog of surplus animals exist today. Hence, the conclusion that there will be an indefinite sellers market for beef and ever higher prices will prevail. This effectively militates against canning for export, both now and in the future.

2. Masailand

The total area of Masai District, which encompasses some 80% of the Arusha Division, is 24,134 square miles. Cattle number in the realm of one million head. While there is reasonable evidence that Masai cattlemen are still building up herd inventories, by the same token there is no overt indication that such herds contain an overly high proportion of mature age market steers. Although the Masai are more conservative than other cattle-owning peoples in Tanzania and they are more possessive of their herds, it is presumptive to suppose that they would not sell under the right conditions. For example, most authorities in West Africa were for years positive that the Nomadic Fulani of the area would not part with breeding stock under any circumstance. Yet the facts are that in 1963/64, with good slaughter bulls selling at 40 Nigerian pounds, the offtake by sex from Fulani herds averaged 25% females and 75% males. In 1970/71 with similar cattle selling at MF 80, the offtake by sex was 40% Female and 60% Male. This circumstance was largely attributed to high price inducement coupled with an increasing want for and ready availability of consumer goods. In this context, the Masai today is judged to stand in about the same position as the Fulani in 1967/68. Certainly these two peoples are not totally different with respect to response to socio-economic pressures.

The argument as to whether or not the Masai will sell surplus animals is fast becoming an anachronism. Change in Masailand is inevitable as evidenced by the daily battle between the Boma (cattle camp) and the Shamba (farm plot). Since history teaches that the plowman usually wins in such conflicts, the real issue is will the Masai be the victim of or the beneficiary of change, but change he must.

The foregoing is not to imply that the Masai will automatically honor established stocking levels and agree to needed offtake rates. Because he has heretofore been forced to maintain extra animals as a hedge against the ravages of disease and ever-impending drought, he must first be convinced that these dangers are no longer a major threat. Without doubt this calls for combined and dedicated effort by all of the responsible technicians on the Masai Project, but especially it falls to the lot of the sociologist to pave the way.

With the foregoing in mind and in the realization of their inadequacies, the following recommendations are made in support of improving the marketing component of the Masai Project. The listing is not necessarily in the order of importance and some of them would not normally come under the heading of marketing, but they are collectively basic to and vital in effecting a sustained economic offtake from Masai herds.

a. General and Supporting

There is need to intensify marketing efforts in Masailand on the grounds that project success or failure will eventually be measured in terms of the annual offtake attained. A participant in marketing is expected to return to the project in late 1973 as counterpart to the NEF marketing specialist. At this time it will be expedient to develop a marketing program and plan of work including an assessment of additional local manpower and associated training needs. In the early stages the marketing plan should be biased in favor of the sociologist, but this should in due course give way

to an economic and cost/benefit approach. Every effort should be made to link Masai Marketing with the overall National Marketing System. Further, appropriate logistic support, especially with respect to transportation for the responsible staff, is basic to success. Lastly, it would be advisable for project marketing staff to establish contact with other livestock projects having marketing components throughout Africa, with the view of sharing experiences, both successes and failures.

b. Organized Markets

Marketing support facilities in the form of trek routes, water points and actual market sites must be developed and/or maintained in Masai land to make it physically possible to move offtake in an orderly manner. While the National Marketing Plan, if and when implemented, would provide some of these services, it is important that this not be overlooked by the Range Management Staff in their overall range development plans. In the event that a National Marketing Plan is unduly delayed, it is suggested that efforts be made with the view of encouraging association members to undertake part of the required work and cost on a cooperative basis.

c. Encourage Cooperative Marketing Within Ranching Associations

It should be recognized that the traditional marketing system that evolved in connection with extracting offtake from scattered nomadic and disorganized subsistence herds is reasonably effective, and nearly impossible to replace with a more efficient system, unless production patterns are simultaneously changed.

Thus, with organized producers akin to the present Ranching Association membership, cooperative marketing is possible and would permit sale more directly to the consumer, effectively circumventing the need of itinerant bush buyers, and place the producers in a better bargaining position. It will probably be expedient to integrate needed local marketing committees into those formed in connection with other aspects of production and grazing management at the level of grazing blocks within ranching associations.

d. Formalize Contracts For Pooled Offtake

Contacts should be made with prospective buyers with the view of selling pooled offtake by formal contract to the extent possible. This approach should contribute to an orderly and sustained offtake by assuring the highest possible return to producers as an incentive to sell. However in the final analysis, offtake cattle should go the best market available at any given time and place, the foregoing notwithstanding.

e. Establish and Follow Analytical Procedures in Collecting Needed Statistical Data

Continuous surveillance of livestock inventories and herd composition must be maintained to establish optimum stocking levels and identify prospective animal for offtake. The number of animals passing through dips is presently being recorded and limited herd composition data have been collected on some Range Associations. It is suggested that the present procedure of recording number of immersions at each association dip be continued, but in addition a standard classification form should be developed to meet the requirements of all project technical sections. Marketing needs would require the following minimal data on cattle:

FEMALES		MALES		Nursing Calves	Market Age Steers
Cows	Heifers	Bulls	Immature		

When a standardized recording form is agreed upon by the project staff concerned, it should be printed and used some three times annually for a full week at each association dip to classify all animals passing therethrough.

This information (plus additions suggested by other project staff) would provide bench mark data for stocking levels, prospective offtake identification and other reproductive/productive assessments. Hence, it should be collected in a central office for tabulation, and analysis. Because of their importance to the project and the ease with which they can be computerized, consideration might well be given to arranging time on a small computer reportedly available in Dar es Salaam to handle these data. If this were possible, it would probably require a short-term consultant on the NEF team to work out operational procedures.

The following table and associated graph of dynamic parameters in a constant sized cattle population at different effective calving rates and/or varying levels of commercializations have been assembled over the years and made available to the NEF team. These data are useful when making projections relative to possible offtake and also helpful in drawing conclusion on herd composition and industry status from information taken in the market place, especially by age and sex.

f. Promote the Establishment of Consumer Cooperative Shops to Service Association Members

There is some risk in encouraging and assisting the Masai to produce and market more and better cattle unless constructive wants can be generated and satisfied, thereby bringing him into a cash economy. To this end provisions should be made to provide ready access to at least selected consumer goods, starting perhaps with already appreciated livestock production orientated supplies (e.g., medicines).

g. Facilitate Credit to the Associations According to Established Need

In attempting to develop Masailand, it is impossible and undesirable for Government to provide all of the costs. Thus, to the extent possible, credit should be provided which would facilitate the development of Masailand by the Masai themselves on a cooperative basis.

h. Note is made of the desirability of the collection and dissemination of market news intelligence in respect of Agricultural Marketing in general and livestock in particular, and that while a market news service is not specifically included among the services to be provided by the proposed parastatal marketing company, some such provision is needed in furtherance of project marketing.

3. Summary

A sustained economic offtake of cattle in conformity with realistically established stocking levels, is one of the more important prerequisites to success in the Masai project. A rational, national marketing policy leading to realistic market infrastructure improvement to facilitate an orderly flow of cattle to the point of slaughter, including Masai offtake, is a project support requirement. No serious reservations are held with respect to the Masai's willingness to sell surplus cattle providing there is reasonable price incentive and efforts are made to create and supply consumer wants. Thus, appropriate recommendations have been made to bring the Masai into the nation's cash economy. The rising demand for beef in Tanzania, and throughout Africa in general, bodes well for the socio-economic future of the Masai project.

KEY PARAMETERS IN A CONSTANT SIZED CATTLE
HERD AT DIFFERENT EFFECTIVE CALVING RATES

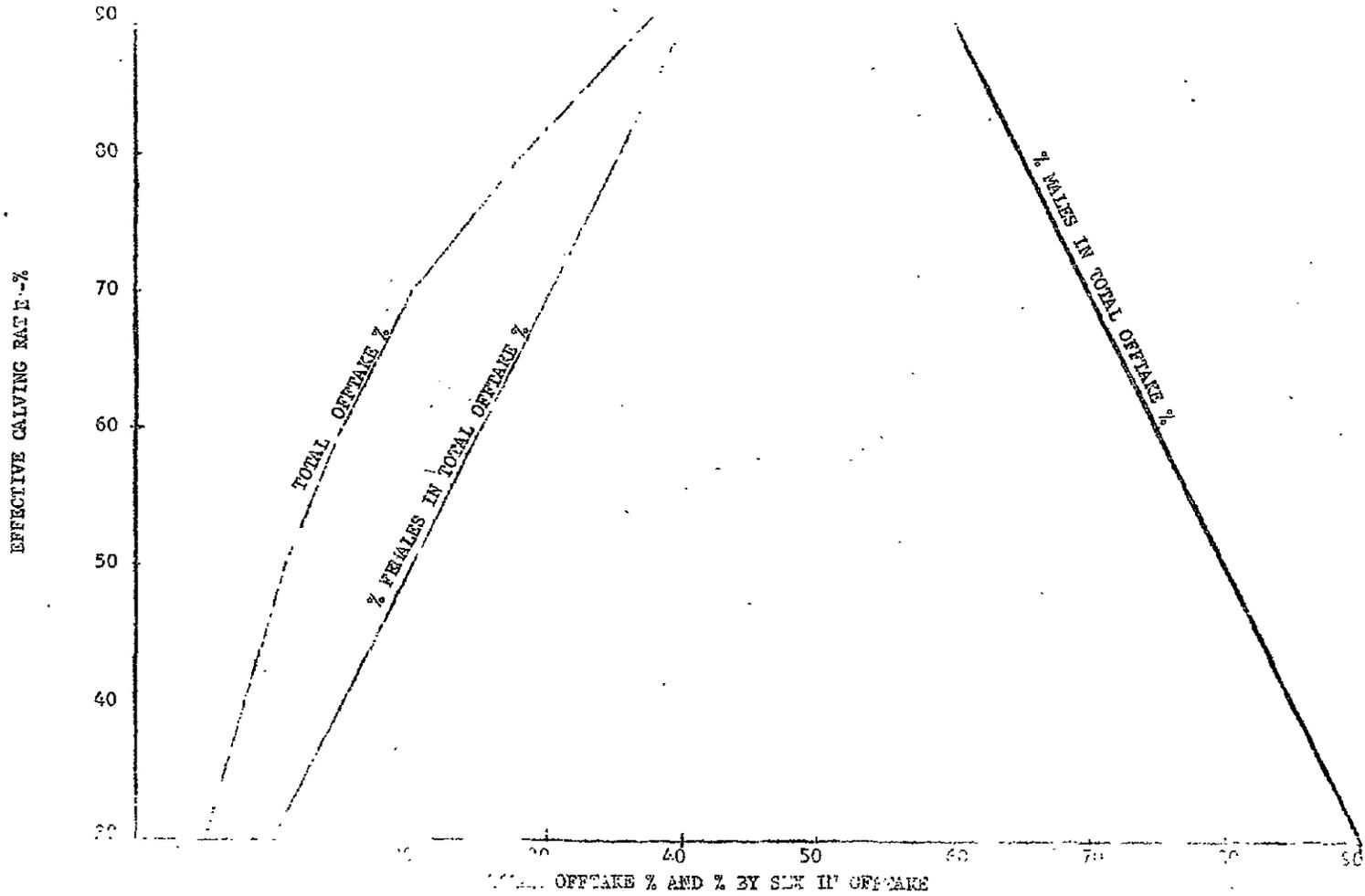
EFFECTIVE CALVING RATE-%	GENERATION INTERVAL (YEARS)	AGE AT FIRST CALVING (YEARS)	% OFFSPRING NEEDED TO REPLACE REPLACEMENT		TOTAL OFFTAKE %	% OF TOTAL OFFTAKE BY SEX AND RELATIVE AGE					
			MALE	FEMALE		MALE			FEMALE		
						YOUNG	OLDER	TOTAL	YOUNG	OLDER	TOTAL
90	4.5	3	3.5	48	38	58	2	60	30	10	40
80	5.0	3.5	4.0	53	28	42	23	65	15	20	35
70	5.5	3.75	4.5	60	20	30	40	70	9	21	30
60	6.0	4.0	5.0	70	15	18	57	75	5	20	25
50	6.5	4.25	6.0	80	11	11	69	80	2	18	20
40	7.0	4.5	8.0	90	8	5	80	85	1	14	15
30	7.5	4.75	12.0	100	5	0	90	90	0	10	10

Notes:

1. Effective calving rate is calf drop minus calfhood mortality.
2. Generation interval in years is the average age of the cows when their offspring are born.
3. Total offtake % is based on total herd number.

EXPECTED ANNUAL OFFTAKE % AND OFFTAKE SEX RATIO IN A CONSTANT-SIZED CATTLE POPULATION AT

VARIOUS EFFECTIVE CALVING RATES



PART V ADMINISTRATION AND LOGISTICAL SUPPORT

During the field visits of this evaluation study certain problems of particular concern to the NEF team in this area were brought to our attention and are noted here.

As already shown in PAR 73-1, the NEF team has had great difficulty with staff and project vehicles of U.S. origin on the rough terrain of project operations. Spare parts and maintenance are a continuous cause for concern. For the present, USAID has arranged a sufficient number of vehicles in good working order for the current team but questions of replacement or additions for new NEF staff will arise in the future. It is suggested that AID/D advise USAID further on this subject at the appropriate time.

NEF also seeks help with drivers. Currently, GOT requires a driver at all times for GOT-owned vehicles under project operation. NEF technicians believe their extensive travel arrangements could be considerably facilitated if the driver could be excused from service when several NEF members are making lengthy journeys in the same vehicle. This would seem to simplify substantially luggage handling, overnight stops and similar logistics. NEF is informed that certain other donor technicians have been able to obtain authorization to drive their own vehicles when travelling in performance of prescribed duties. USAID/Dar es Salaam is requested to review this matter with appropriate GOT officials.

The project office at Monduli is handicapped by lack of office personnel and asks consideration of USAID assistance in arranging for a competent typist and also, if possible, an office manager. USAID is requested to review his request.

During our short visit we were in close contact with the newly assigned Project Manager, who expects henceforth to be in close touch with the NEF staff and related project operations. No doubt many of these logistic questions will be satisfactorily resolved in the near future.

ANNEX A

FRAME OF REFERENCE
Suggested Content of Report

The evaluation team will investigate and report on the following:

1. Suitability of project objectives, goals, and targets.
2. Suitability of project implementation methods being used to achieve objectives, goals, and targets.
3. Progress being made in establishing ranching associations.
4. Progress made in establishment of physical improvements.
5. Progress made in improvement of marketing.
6. Progress made in water development.
7. Progress made in range improvement.
8. Progress made in disease and parasite control.
9. General livestock marketing situation in Tanzania as it affects market operations of the project.
10. General livestock disease situation in Tanzania as it affects project operations.
11. Qualifications and effectiveness of AID - supplied technicians assigned to the project.
12. Adequacy and effectiveness of Mission project management, including backstopping of AID-supplied technicians.
13. Adequacy of AID and TanGov commodity support for the project.
14. Adequacy of AID and TanGov training support for the project.
15. Adequacy of TanGov personnel, legislative, administrative and funding support for the project.
16. Recommendations for future conduct of the project. The recommendations will state whether the project is to be continued or discontinued. If continued, the recommendations will state recommended emphasis levels of AID and TanGov inputs and whether the project should be expanded, curtailed, or continued at about the same level. If the project is recommended for continuation the team will also make recommendations for changes and improvements in implementation, if it finds changes and improvements needed.

ANNEX B

PAR 73-1 is herein included as Annex B of this Evaluation Report.

ANNEX C
1
LOGICAL FRAMEWORK MATRIX

Project Title: Masai Development Project

(Project 093)

NARRATIVE SUMMARY

OBJECTIVE VERIFIABLE INDICATORS

Sector Goal:

To obtain the highest national beef production possible with environmental conservation and improvement. Increased production and offtake will permit higher per capita protein consumption along with greater foreign exchange earning from exports.

Measures of Goal Achievement:

1. Annual herd offtake % increased from 7% in 1970 to 12% in 1980 on fully activated R.A.'s.
2. Average slaughter steer live weight increases from 550 pounds in 1970 to 650 in 1980.

Project Purposes

To reach a sustained high level of off-take in the Masai District consistent with proper land use, resource management and Tanzanian social and economic development goals.

Conditions that will indicate purpose has been achieved: End of project status.

1. Eight R.A.'s will have annual average offtake of 12% or more.
2. Thirteen other R.A.'s will be in various stages of development toward the objective of 12% offtake or better.
3. Calf drop rises from 50% in 1970 to 60% in 1980.
4. Calf mortality reduced from 55% in 1970 to 20% in 1980.
5. Weaning rate increases from 35% in 1970 to 50% in 1980.
6. Average age of slaughter steers at market weight reduced from six years in 1970 to four in 1980.
7. Average age of Females at first calf reduced from five years in 1970 to four in 1980.

Improvements on Association Areas:

Outputs:

1. Rights of Occupancy - security of land tenure.
2. Management and Coordination of Associations through Ujamaa Centers:
 - a) Basic management of market oriented RA's.
 - b) Managed program of innovations.
3. Disease Control: Wick dipping and Dawa (medicine) used.
4. Water Development and Distribution:
 - a) Livestock Improvement:
 - a) Efficient marketing organization.
 - b) Masai sell surplus animals.
 - b) Range Management - stocking quotas and rotational grazing protect range from overgrazing.
5. Providing extension services for livestock improvement.

Magnitude of Outputs:

1. 21 RAs registered with rights of occupancy.
2. a) RAs sub-divided into units.
b) Each RA sub-division has (management) plan.
c) RAs have resident field officer with transport.
3. RAs dip all animals on regular schedule.
4. RAs have 60% of mgt. unit covered with permanent water for dry season use; 40% of mgt. unit covered with temporary water for wet season use.
5. Broad acceptance of breeding and management practices, i.e. improved bulls, castration, selection, disease treatment and control.
6. Evident sales of marketable surplus.
7. RAs complying to stocking rates adjusted to annual range condition studies.
8. Masai acceptance of extension staff advice.

Project Title: Masai Development Project (Project 093)

MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<u>Sector Goal:</u>	
1. Offtake identified by analysis of dipping tank records, herd composition sample surveys, and other available data. 2. Available sales records.	1. Other livestock programs in Tanzania will further increase national off-take and improve the marketing infrastructure. 2. General economic development, increasing human population, urbanization and mounting demand for beef will combine to assure good prices in future.
<u>Project Purpose:</u>	
Committee sales records, Analyses of dipping records, routine RA data, herd composition sample surveys, Veterinary Dept. statistics, and other available data. (Applies to conditions 1-7).	1. Disease control measures, better ranges and more available water supplies leading to improved productivity, will remove the felt need by the Masai to maintain surplus animals as a hedge against disease outbreaks and the perils of draught, and encourage economic offtake levels, 2. The demand for cash by the Masai can be enhanced by making selected consumer goods more readily available through cooperative shops (e.g.; stocker supplies, etc.), and by providing development orientated credit on a cooperative basis. 3. Removing the need for maintaining successive numbers of surplus animals as a hedge against death losses of stock with an increasing demand for beef should bring the Masai into a cash economy.
<u>Outputs:</u>	
1. Range Comm. registration records 2. Project progress reports 3. " " " 4. " " " 5. " " " 6. " " " 7. " " " 8. " " "	1. R.A.'s will develop sufficient self-interest and stake in investment to effectively exclude outside cultivators and other non-members. 2. G.O.T. will vigorously enforce rights of occupancy and assist RA's to resist outside encroachment.

ANNEX D

GUIDE TO RANGE DEVELOPMENT AND MANAGEMENT

Six copies of Annex D were made available in Dar es Salaam. One copy has been transmitted to the NEF, and one will be sent to AID/W. The remaining will be filed at USAID and distributed as needed. ~~Additional~~ *Additional* copies will be reproduced if required.

621-13-130-093

July 1970

January 1973 republic of Tanzania

73-1

United

Masai Livestock and Range Management

DATE LAST PAID	DATE LAST PAID	DATE LAST PAID
70	80	August 24, 1971
March 26, 1971	June 30, 1972	
Executive Director New York NY: \$ 530,000	Current FY Estimate Budget \$ 362,000	Estimated Budget to complete After Current FY: \$ 2,181,000

Near East Foundation (NEF)

Contract

LIST OF ACTIONS

1. This PAR evaluation is a portion of a comprehensive, in-depth review and analysis of the subject project, conducted within the frame of reference shown in Annex A and submitted as Annex B of the complete Evaluation Report. This special evaluation was a condition of Project Authorization No. 0010 of December 2, 1969.
2. Summary recommendations are contained in Part II of Evaluation Report and specific details in Part IV.
3. A similar in-depth evaluation is proposed for early FY 1978 to determine project phase-out, termination or extension.

E. DATE OF REPORT

PROP REP EXT PIC/Y PIC/C PIC/P

Irving H. Licht, AFR/DP

2/9/73

Revised for this FAR as follows.

To reach a sustained high level of off-take in the Masai District consistent with proper land use, resource management and Tanzanian social and economic development goals.

1. Ten R.A.s will have an annual average off-take of 12% or more.

2. Eleven other R.A.s will be in various stages of development toward the objective of a 15% or better annual average off-take.

3. Enough cattle are sold through R.A.s to pay for self-help development programs (estimated magnitude is 1,000 cows each year per R.A.).

4. Changes implemented without coercion of Masai.

1. Direct data not yet available. Analysis shows in Marketing section of Evaluation Report confirm 7% off-take in FY '70 and sets new target of 12% in FY '80.

2. Same as 1.

3. Kijungu R.A. is raising an additional 50,000/- as matching funds to obtain Rural Development Bank loan of \$100,000. 2 other R.A.s have contributed 20,000/- each for development.

4. 8 R.A.s have been registered and 3 other areas have applied for registration. The Masai's willingness to cooperate is exceeding the ability of the technical staff to implement.

Revised for this FAR as follows.

To obtain the highest national beef production possible with environmental conservation and improvement. Increased production and off-take will permit higher per capita protein consumption along with greater foreign exchange earnings from exports.

1. Average annual off-take on fully activated R.A.s 12% in FY '80 compared to 7% in FY '70.
2. Average slaughter steer live weight increases from 550 pounds in 1970 to 650 in 1980.
3. Social organization: 21 cooperative Ranching Associations organized.
4. Proper range management will also yield improvement in wildlife habitat, conservation and better utilization other valuable resources, e.g. charcoal, timber, logs.
5. Soil erosion would be held to a minimum with a resultant increase in watersheds and water quality.

PROJECT APPRAISAL REPORT (PAR)

PAGE 1

1. PROJECT NO. 621-17-130-003	2. PAR PER PERIOD July 1970 TO January 1972	3. COUNTRY United Republic of Tanzania	4. PAR SERIAL NO. 78-1
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Masai Livestock and Range Management

6. PROJECT DURATION: Begin FY _____ End FY _____		7. DATE LATEST PROP _____	8. DATE LATEST PIP _____	9. DATE PRIOR PAR _____
10. U.S. FUNDING	a. Cumulative Obligation Through Prior FY: \$ _____	b. Current FY Estimated Budget: \$ _____	c. Estimated Budget to completion After Current FY: \$ _____	
11. KEY ACTION AGENTS (Contractor, Participating Agency or Voluntary Agency)				
a. NAME Next Page Foundation (NEF)			b. CONTRACT, PARA OR VOL. AG. NO. Contract	

12. NEW ACTIONS PROPOSED AND REQUESTED AS A RESULT OF THIS EVALUATION

A. ACTION ID			B. LIST OF ACTIONS	C. PROPOSED ACTION COMPLETION DATE
USAID	AID/W	HOUS		
			<p>This PAR form is included in the Evaluation Report in order to show the revised indicators which correspond to the revised Logical Framework of Annex C. Yearly targets to be determined in revised PIP.</p>	

13. NEW ACTIONS REQUESTED	<input type="checkbox"/> PROP <input type="checkbox"/> PIP <input type="checkbox"/> PRO AG <input type="checkbox"/> PRO/T <input type="checkbox"/> PRO/C <input type="checkbox"/> PRO/P	14. DATE OF REVISION: _____
PROJECT DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE Irving H. Licht, AFR/DP 2/3/73		MISSION DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE

DEPARTMENT OF STATE AGENCY FOR INTERNATIONAL DEVELOPMENT	1. Cooperating Country UNITED Republic of Tanzania	2. S. Code No.
	2. Project/Activity No. and Title 621-11-130-093 Masai Livestock and Range Management	Original OR No.

Use this form to complete the information required in any block of a PA/PR form.

Part II A5
contd

This portion of the project is only in the early stages: little has been done yet to develop management plans for 8 registered associations. Some water works and dips were installed without grazing plans. Whether these were properly placed will be determined when the management plan is prepared. In addition, water supplies thus developed may not fully meet requirements. Furthermore, ranching associations have not yet been fully demarcated and some encroachment by cultivators is occurring with adverse effects of soil erosion already evident.

Part II A5
contd

There has been a delay in securing films and other training materials. USAID has now arranged to provide the number of U.S. origin vehicles in good working condition sufficient for the current NEF team including the Animal Production Specialist whose nomination is expected soon. However, in view of the serious parts and maintenance problems on U.S. vehicles, AID/W should review possible authorization of Land Rovers as replacements when needed.

Also, arrangements between USAID and GOT on implementation procedures of the U.S. loan have just been concluded so commodities on order are being shipped from U.S. suppliers and delivery is expected about July, 1973.

PART II A6
contd

The RDD (Regional Development Director) and DDD (District Development Director) have given assurances they will take necessary actions to adjudicate differences with both cultivators and even other Masai herdsmen who may encroach registered RAs, and to safeguard RA member rights of occupancy.

Under a recent, broad, government reorganization, executive responsibility for this project is now at Regional and District level, much closer to local situation, which reinforces already strong leadership and support GOT affords this whole undertaking. Lending further impetus to this trend is the GOT decision to accord priority to Masai District within Arusha Region in respect to developmental and emphasis.

The Range Management Act is in process of amendment and some progress has been noted in Marketing. Implementation of the concept of Ujamaa RAs was delayed somewhat due to the lack of a sociologist who has now arrived and assumed an active role in project affairs. Inadequate provision of truck transport by the Tanzanian Government (GOT) has seriously delayed development work, although the provision of Land Rover transportation for Association personnel has been excellent.

Masai Livestock and Range Management

III. KEY OUTPUT INDICATORS AND TARGETS

A. QUANTITATIVE INDICATORS FOR MAJOR OUTPUTS		TARGETS (Percentage/Rate/Amount)					END OF PROJECT
		CUMULATIVE PRIOR FY	CURRENT FY		FY	FY	
			TO DATE	END			
1. R.A.s with rights of occupancy (there is normally a time lag after registration and before securing rights of occupancy).	PL. MGRD						
	ACTUAL PERFORMANCE						
	REPLANNED						
2. R.A.s complying to stocking quotas adjusted to annual range conditions studies.	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						
3. RAs dip all animals on regular schedule.	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						
4. RAs have 60% of mgt. unit covered with permanent water for dry season use; 40% of mgt. unit covered with temporary water for wet season	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						
B. QUALITATIVE INDICATORS FOR MAJOR OUTPUTS		COMMENT:					
a) RAs subdivided into units. b) Each RA subdivision has Mgt. Plan. c) RAs have resident field officer with transport.		COMMENT:					
2. Broad acceptance of breeding and management practices, i.e., improved bulls, castration, selection, disease treatment and control.		COMMENT:					
3. Evident sales of marketable surplus.		COMMENT:					

PROJECT NO.	PERIOD FOR WHICH PAR IS FOR PREPARED	COUNTRY	PROJECT SERIAL NO.
621-11-130-093	July 1970 to January 1973	United Republic of Tanzania	74-1

IV. PROJECT PURPOSE

To reach a sustained high level of offtake in the Masai District consistent with proper land use, resource management and Tanzanian social and economic development goals.

2. Evidence to date of progress toward these conditions:

1. Eight RAs will have annual average offtake of 12% or more.
2. Thirteen other RAs will be in various stages of development toward objective of 12% offtake or better.
3. Enough cattle are sold through RAs to pay for self-help development programs.

V. PROGRAMMING GOAL

Statement of Programming Goal Revised for this PAR as follows:

To obtain the highest national beef production possible with environmental conservation and improvement. Increased production and offtake will permit higher per capital protein consumption along with greater foreign exchange earnings from exports.

1. Average annual offtake on fully activated R.A.s 12% in FY '80 compared to 7% in FY'70.
2. Average slaughter steer live weight increases from 550 pounds in 1970 to 650 in 1980.
3. Social organization: 21 cooperative Ranching Associations organized.
4. Proper range management will also yield improvement in wildlife habitat, conservation and better utilization other valuable resources, e.g., charcoal, timber, logs.
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