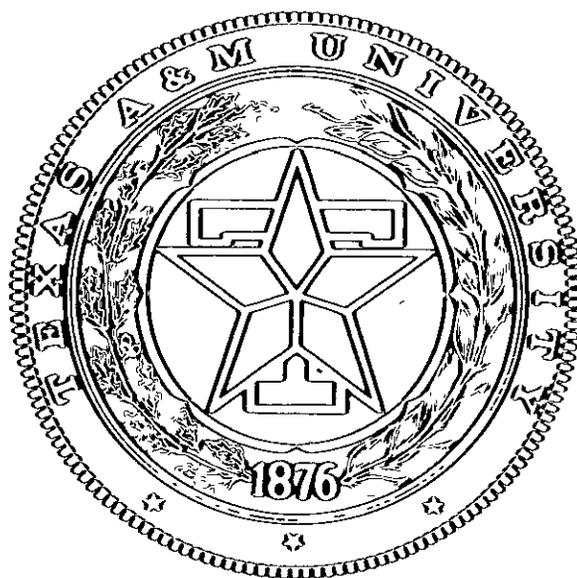


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Tanzanian Livestock-Meat Subsector

Volume II: Livestock Survey Data and Marketing Model



Texas A&M University
and the
United States Agency for International Development
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TANZANIAN LIVESTOCK-MEAT SUBSECTOR

Volume II: Livestock Survey Data and Marketing Model

International Programs
College of Agriculture, Texas A&M University
College Station, Texas 77843
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PREFACE

This study of the Livestock-Meat Subsector is a part of a larger project of Livestock Development in Tanzania. The field work was conducted in 1975 and preliminary drafts were made available to TAMU/USAID and Tanzanian officials of LIDA in July, 1976. The study is designed to assist in planning the development of the Livestock-Meat Subsector. It is assumed that specific projects will have their own detailed plans. This study was designed to examine the industry and document detailed information concerning the traditional herd and make recommendations for an improved subsector.

The study is reported as follows:

- Volume I Consultants' Report
- Volume II Livestock Survey Data and Marketing Model
- Volume III Regional Survey Data for Mara, Mwanza, Shinyanga, and Tabora Regions.
- Volume IV Regional Survey Data for Singida, Dodoma, and Arusha Regions.

D. E. Farris, Subsector Study Coordinator

Acknowledgements

The success of the livestock survey is due in part to the cooperation and goodwill received from many individuals who gave their assistance either directly through their physical help or indirectly by advice or encouragement.

Mr. K. W. Stokes and Dr. J. M. Sprott provided valuable assistance in planning the survey. In development of the questionnaire, Drs. John Moris and Colby Hatfield of the Masai Range Project and Dr. Mascrenius, BRALUP, University of Dar es Salaam, gave valuable advice in construction of questionnaire and survey techniques gained from their experience in previous surveys in Tanzania. Field testing and preparation for main survey team was carried out diligently by Mr. Masaba of the Bureau of Census and Mr. B. Rwanshane from LIDA.

Administrative support and suggestions for the study were provided by General Director Dr. Madalali, LIDA and Dr. Maeda, Director of Livestock Development Ministry of Agriculture. A special mention of gratitude to Mr. Mpogolo, director, and Mr. J. Prasad, F.A.O. statistician of the Bureau of Statistics for providing data for the sample and releasing five field enumerators from their staff. M. B. Inman, Chief of Party, provided essential administration.

Full cooperation was received at all levels of government in implementing the survey. Government and parastatal livestock personnel made advance preparations before main survey teams arrival so interviewing would be successful. District Development Directors, Divisional and Ward Secretaries and village chairmen jointly cooperated through their offices to locate and educate respondents of the government's support for this survey. Personnel from one of their offices traveled with the survey team at all times while in the district.

A great deal of gratitude and appreciation go to the enumerators (Mr. Lyakulwa, Mwenda, Rubea, Swedi, Tegamischio of the Bureau of Statistics and Mr. Ole Ngulay, Ealeiya, Benjamin, Ephraem, and Yesaya from Arusha) who interviewed long hours and counted many cattle in making this survey a success. Marcia Lightsey and Bernadine Tripp tabulated and typed the report.

Finally, to the respondents who frankly and honestly related their practices and problems in expectation that solutions will be found — to them the survey is dedicated.

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ABSTRACT

Volume II consists of (1) a Marketing Model used to provide guides for pricing and plant location and (2) a Survey of the Traditional Livestock Industry which documents current facts, practices and problems of the livestock industry of Tanzania.

The marketing study uses a transportation model to estimate patterns of livestock and meat movements, derive estimates of the value of various plant locations and show price differences due to geographic location. With only one commercial slaughter plant in the country at Dar es Salaam the dominant flow pattern of cattle is from the interior to Dar es Salaam. Plant capacity being available in Shinyanga alters this pattern. Slaughtering cattle in the concentrated production area and shipping out meat could save an estimated two million shillings in transportation per year and about that much more on savings in shrink and death loss by avoiding the long hauls of live cattle. Additional savings were estimated for locating plant capacity at Arusha, but this assumes reduced live exports to Kenya. The feasibility of a plant at Arusha is not clear unless it is assumed that the plant could compete for cattle that was being trekked into Kenya. The Mbeya plant capacity did not indicate any reduced saving in transportation cost with current production patterns. Additional cattle production in the Mbeya area would be required to economically justify the planned construction.

The marketing model provides guides for pricing patterns due to geographic location. Briefly, it shows that the interior regions South of Lake Victoria down to Tabora should be the lowest price areas. If all marketing costs are included, an average price difference is estimated TSH 32/- per cwt for live cattle between the surplus cattle zone and the coastal cattle deficit areas. Price differences between the Lake Victoria cattle zone and deficit cattle areas on the coast given 1976 transportation rates are reduced on the average by TSH 4/07 per live cwt with an additional slaughter plant in Shinyanga.

Personal interviews were conducted with 792 randomly selected cattle herders during the dry season of 1975. The herdsmen in the sample owned an average of 27.3 cattle, 13.7 goats and 9.1 sheep. This survey documented the general observations made by the consultants in Volume I, that the traditional herd is a multipurpose herd kept for milk, meat, cash, dowry and for banking and insurance. Commercial sales are generally a by-product, or at least, a joint product with other activities. Under the communal grazing conditions herdsmen engaged in very few improved practices and had practically no improved breeds of cattle.

Dipping as an indication of adoption of improved practices shows 71 percent of respondents had not dipped their cattle in 4.23 months on the average. Data show that animal health practices are inadequate. There was practically no supplemental feeding or mineral supplements used. Calf death loss was 28 percent in 1975, and gross herd offtake was 29.4% for cattle, 35.1% for goats, and 10% for sheep in 1975. This overstates country offtake to the extent there was double counting due to interherd transactions. Although there was a great deal of herd to herd variation in herd size and management practices there was considerable similarity within herd size groups and among regional averages.

The survey shows clearly that almost no modern technology is being employed in the traditional herd management. This survey provides a basis for understanding the programs that can improve productivity and some of the insight needed for designing them to fit the conditions and to attack the problems that are bottlenecks to increased output. This section supports the observation of the consultants recorded in Volume I that relatively simple improvements in technology known to have a high payoff in other countries have not yet been widely adopted in the traditional herds in Tanzania.

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EAST AFRICAN MARKETS AND TANZANIAN POLICIES FOR
PRICING AND PLANT LOCATION - LIVESTOCK AND MEAT
By D.E. Farris, G.M. Sullivan and K.W. Stokes

SUMMARY

A model of the Tanzanian beef markets was designed to estimate the price difference among markets due to transportation cost, optimum number of plants and plant locations for a variety of conditions.

Using production and consumption data for the 1968-70 period and 1976 transportation costs total transportation cost of live cattle and beef amounted to shs. 73.5 million, but with the assumed addition of three new plants in the interior (Shinyanga, Arusha and Mbeya) transportation cost declined five percent. Had the model taken into account death loss and shrink, the reduction in total cost would have been about double that due to transportation alone. It is quite clear that a new plant in the interior would be a wise investment. Additional plants in Arusha and Mbeya have some merit, but their value depends on expected production increases and live exports.

The specific results of these models suggest that a plant located in Shinyanga in addition to the one at Dar would reduce total transportation cost further to shs. 3.6 million than, the addition of the Mbeya plant increased total transportation cost. This suggests the Mbeya plant capacity would contribute less to economic development than the one at Arusha unless cattle production is increased in the Mbeya area. However, if live cattle continues to move to Kenya the Arusha plant is of doubtful value.

The models yield imputed price differences and these for model I suggest a price premium of shs. 18/cwt. in Dar over West Lake and almost

16 shs. over Shinyanga. If death loss and shrink are taken into account these premiums would increase to about shs. 30 per cwt. live weight.

The solution of the models illustrates the need for geographic price differences based on cost of reaching alternative markets. Location of plants in the interior reduces the price difference to one-half compared to relying solely on the Dar plant. The saving potential is such that the cost of slaughter and canning capacity could be recouped rapidly considering a saving of an estimated U.S.\$3 million per year from savings in transportation cost, death loss and shrink.

Results of this study can serve as guides to policy decisions. Application to a specific route or price differential must be adjusted for current conditions. Results of the models were consistent with standard principles of geographic price differences with surplus areas having the lowest prices and deficit areas having the highest prices. Specific model results were that prices were generally highest in the Southeast and lowest in the Northwest. Locating a plant in Shinyanga reduced the price difference between Shinyanga and the coast by shs. 7/(U.S.\$1) per cwt. liveweight. Dar es Salaam and Mtwara had the highest price for cattle in all models and Northwest areas were the lowest. Shingida-Tabora area would be the lowest price area if movement of live cattle into Kenya were included in the model.

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By D.E. Farris, G.M. Sullivan and K.W. Stokes*

Introduction

Tanzania for a time regularly exported live cattle to neighboring countries and canned beef to markets in Europe, primarily the United Kingdom. At times it has exported chilled beef to nearby countries. Considering the lack of development of the livestock meat sub-sector and the lack of development of infrastructure it appears it has potential to substantially expand beef exports if certain planned improvements are accomplished.

During 1975 exports became increasingly difficult to arrange, and the cattle industry suffered severely from drought and lack of export markets. A single packing plant located in Dar es Salaam slaughters for canned beef export. It also provides fresh beef for the city. Long trekking and hauling without feed and water results in excessive shrink and death loss.

The cattle-beef sub-sector is characterized by low productivity, high live marketing costs and by market prices controlled by government that do not provide the incentives required to increase output or quality. Analyses are needed to provide policy guides on pricing and plant location

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to increase pricing and physical efficiency of the sub-sector.

A transshipment linear programming model, using data from a relatively stable period was used to provide estimates of optimum plant locations, efficient pricing patterns and potential product flows from Tanzania to East African markets.

Livestock inventory in Tanzania in 1970 was estimated at 13.1 million cattle, 4.4 million goats and 2.8 million sheep. Even though this is slightly more cattle than was estimated for Texas in the same year, the offtake was only a fraction of that in developed countries. It has been estimated at less than 10 percent with market offtake as low as 3 percent.

A livestock development plan is in operation that is based on the hypothesis that slaughter capacity located in the surplus cattle areas will increase marketing efficiency. This study attempts to test that hypothesis and provide additional guides for pricing and market development.

Methodology

A transshipment linear programming model is used to estimate the cost saving in total transportation. This also provides estimates of spatial price differences and optimum plant location. Sources of production, sources and destinations for slaughter, and destinations for consumption are linked to minimize transportation costs.

Supply Capacities for Beef Cattle

Seventeen cattle production regions were chosen as representative

of livestock regions (Figure 1). Data is available for the period 1968-1970 for the average annual offtake of head of cattle. It will be assumed that each animal has an average weight of 5.24 hundredweight; therefore, supply capacity for each region will be in live hundredweight (see Table 1).

Slaughter Capacity for Each Region

Demand requirements of beef for slaughter include the seventeen domestic production regions in addition to three export markets for live animals. The three export markets are: Lusaka, Zambia; Kampala, Uganda; and Kinshasa, Zaire.

Data on slaughter capacity for the seventeen internal markets is nonexistent so it has to be extrapolated from aggregate consumption from larger livestock zones (Table 2). Slaughter capacity for the seventeen regions in Tanzania is calculated by the following equation.

$$(EQ1.) \text{ Total Slaughter Capacity} = (\text{Pounds of liveweight of beef/capita/} \\ \text{year for Zone}_j) (\text{Population for Region}_{ij})$$

It is assumed that the pounds of liveweight of beef/capita/year for Zone_j will be equivalent over the entire space of the zone.

Consumption demand for each region

Total consumption capacity for each region was assumed equivalent to its local slaughter capacity. All the cattle which are slaughtered will be consumed in the region except where a commercial slaughter plant is located in the region (Table 3).

Data on slaughter and consumption capacity for the three African

Table 1. Average offtake of cattle by regions in Tanzania

<u>Region</u>	<u>Average offtake of cattle 1968-1970 in Liveweight</u>
	<u>----- (Cwt.) -----</u>
Arusha	313,527
Coast	13,506
Dodoma	254,760
Iringa	84,242
Kigoma	4,994
Kilimanjaro	111,418
Mara	43,100
Mbeya	42,963
Morogora	32,963
Mtwara	23,285
Mwanza	77,843
Ruvuuma	13,674
Shinyanga	256,000
Singida	160,823
Tabora	172,629
Tanga	44,225
West Lake	43,396

Source: Phase II Livestock Development Project. Ministry of Agriculture and Cooperatives, Dar es Salaam, Tanzania, November, 1971, Vol. 4.

Table 2. Human population, total consumption and liveweight per capita consumption of beef by livestock zones

Zones	Population ¹	Consumption of beef in Zone _j	Liveweight ² per capita consumption
		(Head)	(Pounds)
South Western	1,659,200	22,000	7.0
Northern	2,034,000	44,500	11.6
Sukumaland/Lake	3,719,600	40,500	5.7
Eastern	2,636,000	72,100	14.4
Southern	1,434,000	9,000	3.3

¹Population data is from 1967 national census.

²Liveweight/capita consumption was figured by following equation:

$$\text{Liveweight per capita consumption in beef Zone}_i = \frac{(\text{Consumption in Zone}_j \text{ in head of cattle})(5.28)}{\text{Total population in Zone}_j}$$

³Assumed one head of cattle equivalent to 5.24 cwt.

Source: Phase II Livestock Development Project. Ministry of Agriculture and Cooperatives, Dar es Salaam, Tanzania, November, 1971, Vol. 4.

Table 3. Basic data required for the model, 1968-1970

Zone	Human population	Per capita consumption	Total slaughter capacity	Total consumption	Total production by region
	--(No.)--	--(No.)--	--(Cwt.)--	--(Cwt.)--	--(Cwt.)--
<u>Zone I: Northern</u>					
Arusha Region	610,400	11.6	70,806	70,806	313,527
Kilimanjaro	652,700	11.6	75,713	75,713	111,418
Tanga	771,000	11.6	89,448	89,448	44,285
<u>Zone II: Eastern</u>					
Coast Region	771,000	11.6	89,448	112,939	13,506
Dodoma	709,300	14.4	102,139	102,139	254,760
Morogora	685,000	14.4	98,640	98,640	32,530
Singida	458,000	14.4	65,952	65,952	160,824
<u>Zone III: South West</u>					
Iringa Region	689,000	.7	48,293	48,293	84,242
Mbeya	969,000	.7	67,851	67,851	42,963
<u>Zone IV: Sukumalund/Lake</u>					
Mara	544,000	5.7	31,008	31,008	43,100
Kigoma	473,000	5.7	26,983	26,983	4,994
Mwanza	1,059,100	5.7	60,140	60,140	77,843
Shinyanga	899,500	5.7	51,271	51,271	256,000
Tabora	562,900	5.7	32,085	32,085	172,629
West Lake	658,100	5.7	37,511	37,511	43,395
<u>Zone V: Southern</u>					
Ruvuuma	393,000	3.3	12,969	12,969	13,675
Mtwara	1,041,000	3.3	34,353	34,353	23,285

Source: Phase II, Livestock Development Project. Ministry of Agriculture and Cooperatives, Dar es Salaam, Tanzania, November, 1971, Vol. 4.

export markets for live animals from Tanzania is an arbitrary quantity simply to allow the model to provide the imputed marginal costs and price differences. The same transportation equations were used to estimate freight rates. Shipments to these markets occur but are erratic due to political and other problems. Inclusion of these three export markets is necessary to represent the East African market for Tanzanian cattle and beef.

Distances Between Markets and Transportation Costs

In each of the seventeen regions, a major town was chosen as the slaughter and consumption center. Transportation costs between market points were estimated from equations fitted to the actual rates available:

(1) Live cattle

$$Y = 6.4338 + .01783X$$

where: Y = total costs/cwt. in Tanzanian shillings for total distance travelled for live cattle or live animal equivalent,

b_0 = fixed costs for shipment of live animals or live animal equivalent,

b_1 = the incremental increase in cost per unit of distance travelled.

(2) Chilled beef in live animal equivalent,

$$Y = 3.9465 + .016457X$$

Description of Models

Model I represents the marketing system presently in operation. One commercial packing plant processes cattle into unrefrigerated carcasses for local trade and chilled or canned beef for export.

Surplus live cattle in the regions are shipped either to Dar es Salaam (Coast Region) where Tanganyika Packers Ltd.'s (TPL) plant is located or to African export markets.

In Model I, slaughter capacity at Dar es Salaam is assumed to include the regional slaughter capacity for the Coast Region plus capacity to include the surplus cattle production from all domestic regions to allow for export of processed beef.

Consumption capacity for Teheran (a hypothetical export market) is the net difference between the increased slaughter capacity for the Coast Region and consumption capacities for all other locations. Transportation costs from Dar es Salaam to Teheran is lower than from the other markets so all chilled or canned beef leaves from Dar es Salaam.

In Model IV, slaughter plant capacity is assumed for four regions to test the hypothesis: whether slaughter plants located in surplus cattle areas would reduce the total transportation cost for the system. Model II considers one new plant in Shinyanga, the largest cattle surplus area; this plant is currently under construction. Model III considers a third plant at Arusha.

The four regions with slaughter plants (Coast, Arusha, Shinyanga, and Mbeya) have equivalent slaughter capacities and transportation costs in shipping chilled or canned beef to Teheran.

Results

Analysis of the current situation is represented by Model I and illustrates the incentive for exporting live cattle to neighboring countries due to lack of slaughter capacity in the interior (Figure 1). Another factor encouraging live cattle movements is the preference for slaughtering in the city where it is consumed. The general distribution

Figure 1. Estimated Movement of Cattle and Beef with Packing Plant in Dar es Salaam on the Coast (Model I).

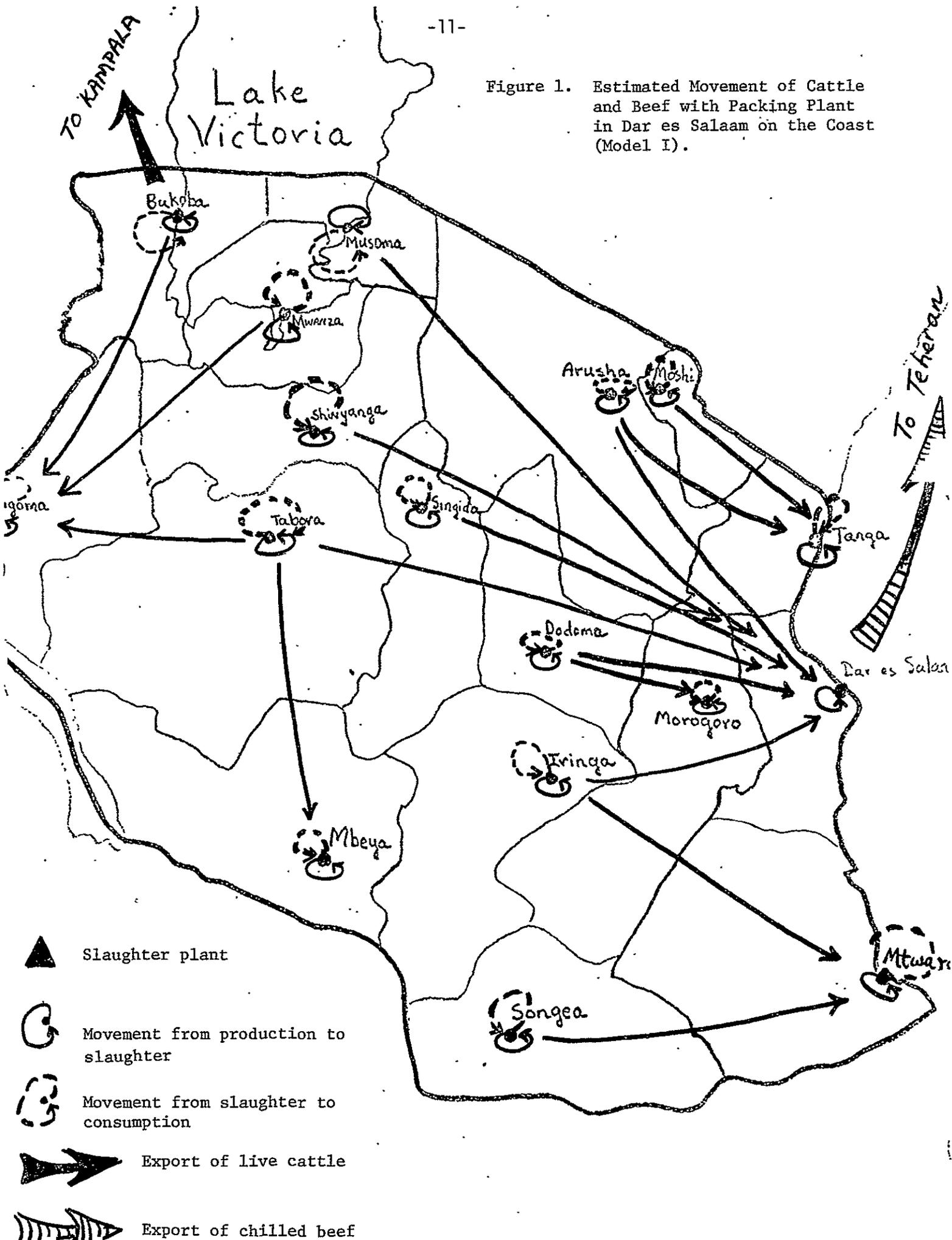
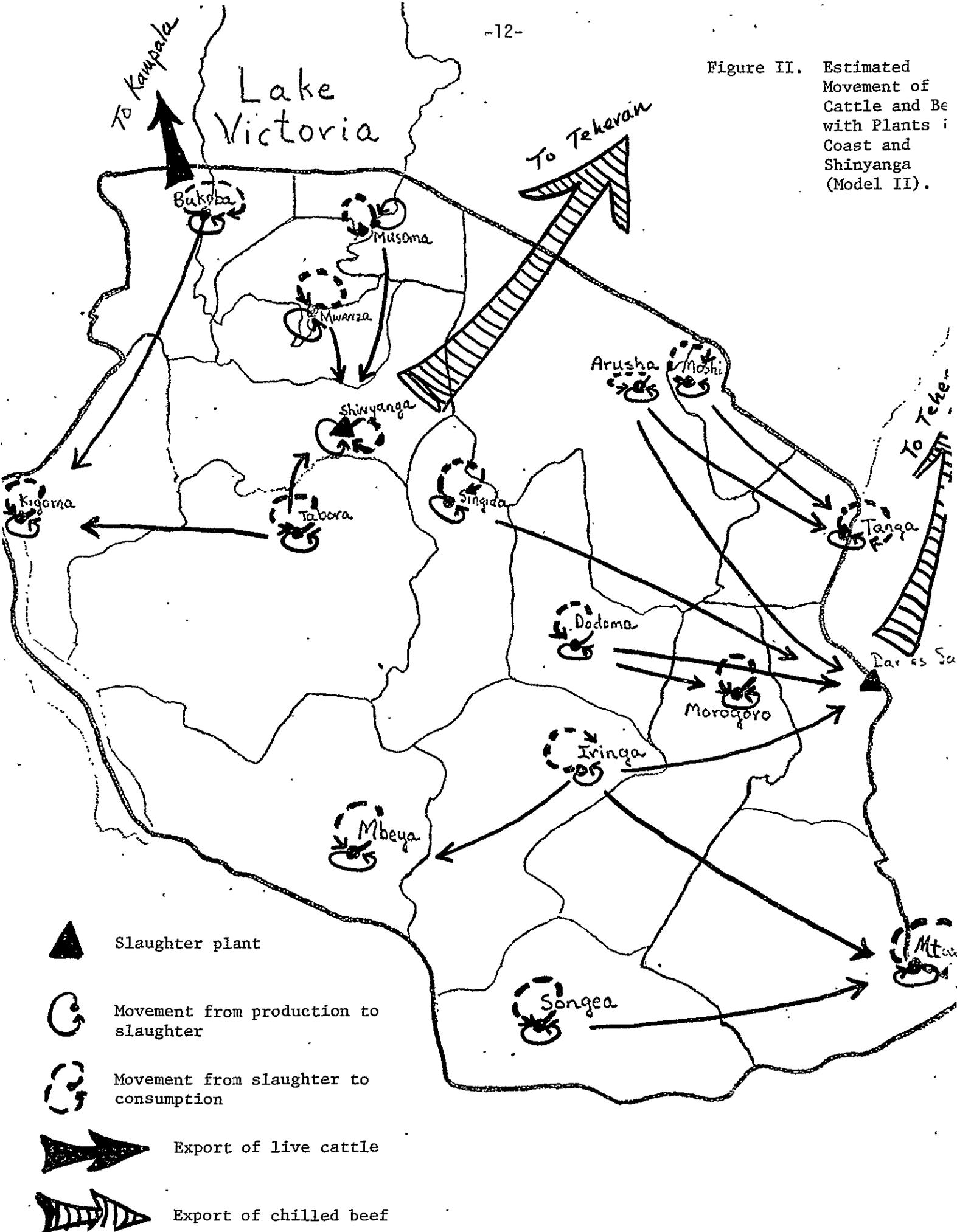


Figure II. Estimated Movement of Cattle and Beef with Plants to Coast and Shinyanga (Model II).



pattern appears to be in line with the observed situation for the time period on which the data are based.

Models II and III represents the post-1976 situation when it is assumed adequate slaughter capacity can be provided in the surplus cattle areas. Even though shrinkage and death loss is not charged to live cattle movement, total transfer cost is minimized by using slaughter capacity in Arusha, Shinyanga and Mbeya in addition to the plant operating at Dar es Salaam. In fact the total transportation cost was reduced by 3.6 million T.S. per year or 5 percent (Table 4).

Table 4. Comparison of Total Transportation Costs for Model I and Model II

Model	Total Transportation Costs	Savings	
	(TSH)	(TSH)	(Percent)
Model I	73,495,034 ^{a/}		
Model II	71,433,504	2,061,530 ^{b/}	2.8
Model III	69,878,837	3,616,197 ^{c/}	4.9
Model IV	69,908,325	3,586,709 ^{d/}	4.8

^aEquivalent U. S. \$8,646,475.

^bEquivalent U. S. 242,532.

^cEquivalent U. S. 425,435.

^dEquivalent U. S. 421,966.

This suggests that the savings in transportation costs alone to the cattle-beef sub-sector would amount to 3.6 million T.S. per year and would indicate that the capacity in the new locations would be a good investment. This assumes that the necessary adjustments in the economy would

be made to handle chilled meat transportation and sales. This is a heroic assumption and since this condition is not a part of the model a more precise statement of the results is that substantial economic incentives exist to justify expanding slaughter capacity first to the Shinyanga-Tabora area, then to Arusha and next to Mbeya (Table 5) Marginal transportation costs at the final consumption points are substantially reduced by the second plant whereas there is little reduction from adding 2 more plants (Table 5).

Imputed prices may be used to show cattle price differences due to transportation cost. The price pattern shows the Lake Victoria areas having the lowest price with the price rising along the coast reaching its highest point at Mtwara where it was 21.8 T.S. per cwt. above West Lake in Model I and 17.8 in Model II (Figure 3). Since death loss and shrinkage were not included in the cost of transportation, these imputed values measure only about one-half of the price differences that would prevail in an open market system. Nevertheless, this general price pattern would be expected to hold with only an increase in the differences if all costs of transfer and cattle losses were included. Actually the Tabora-Shinyanga-Mwanza areas would be the lowest price areas if data were available to reflect the northern movement of cattle across the border.

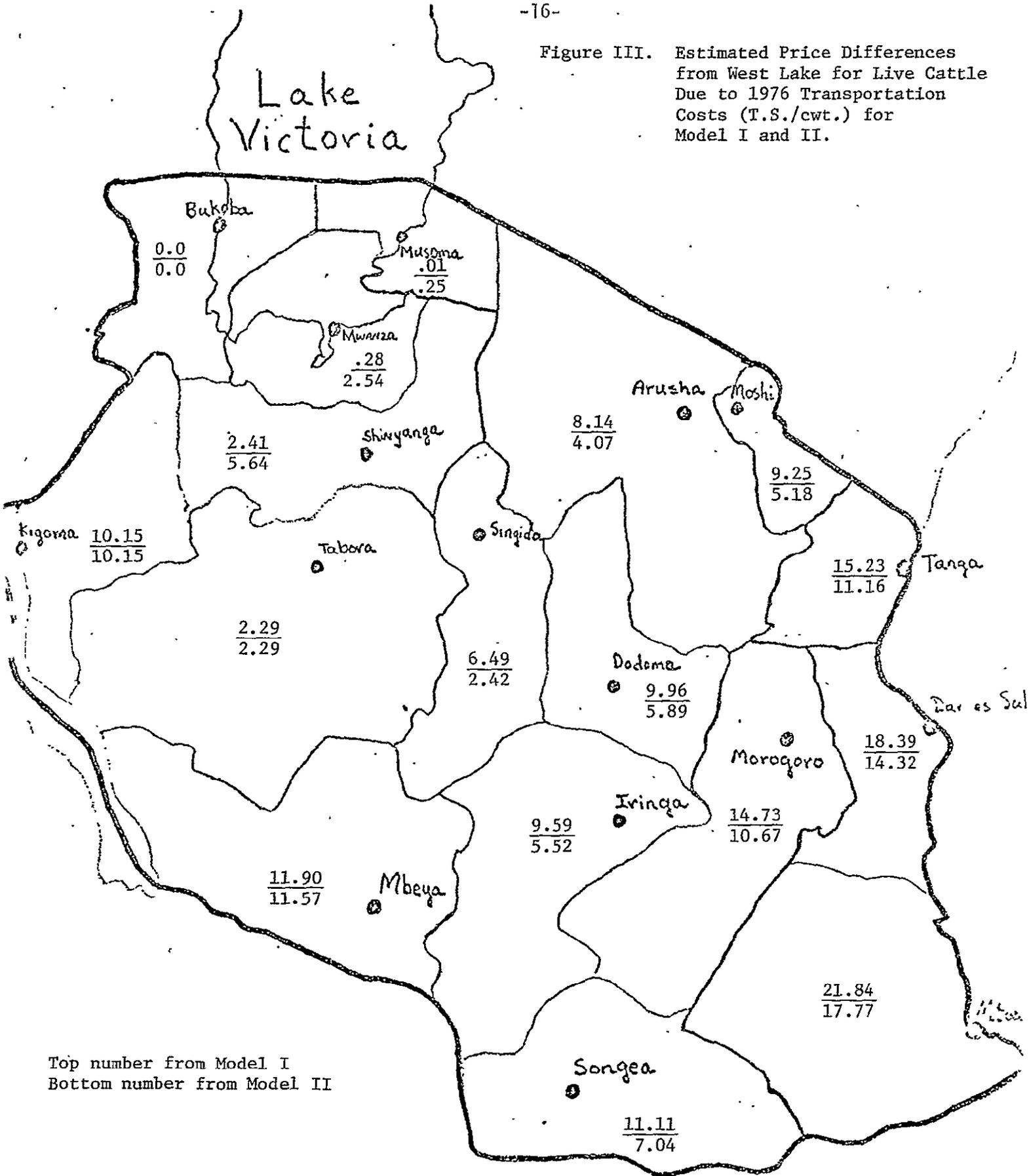
Imputed price differences from Model II show that the location of packing plant capacity at the interior points cuts the price differential between Shinyanga and Dar es Salaam to one-half (from $18.4 - 2.4 = 16.0$ in Model I, to $14.3 - 5.6 = 8.7$ T.S./cwt. in Model II). The northwestern part of the country remains the lowest price area and the Southeast remains the highest price area for live cattle (Figure 3 and Table 6). This specific result assumes no live cattle being sold in Kenya.

Table 5. Comparison of marginal transportation costs for an added unit of beef consumption by regions as plants are added, 1976.

Region	1 Plant Model I	2 Plants Model II	3 Plants Model III	4 Plants Model IV
(T. S./live cwt. equiv.) ^a				
Arusha	23.16	19.09	20.30	20.30
Kilimanjaro	23.59	19.52	20.69	20.69
Tanga	26.57	22.50	24.02	24.02
Coast	28.84	24.77	24.96	24.96
Dodoma	24.87	20.27	20.69	20.46
Morogoro	27.52	22.70	23.01	22.89
Singida	23.21	18.42	18.38	18.42
Mbeya	28.15	23.11	22.26	22.26
Iringa	25.54	21.47	21.89	21.66
Mara	18.67	17.76	15.64	15.64
Kigoma	23.26	20.60	20.60	20.60
West Lake	18.06	16.22	17.50	16.22
Mwanza	19.49	17.84	15.13	15.13
Shinyanga	21.21	16.12	16.12	16.12
Tabora	22.82	17.98	17.98	17.98
Mtwara	32.32	28.25	28.67	28.44
Ruvuuma	26.38	22.31	22.73	22.50
Lusaka, Zambia	37.39	33.00	33.00	33.00
Kampala, Uganda	15.67	14.76	14.76	14.76
Kinshasa, Zaire	39.10	38.19	38.19	38.19
Teheran, Iran	95.47	91.40	91.40	91.40

^aConverted to carcass beef, these values would need to be multiplied by 2.

Figure III. Estimated Price Differences from West Lake for Live Cattle Due to 1976 Transportation Costs (T.S./cwt.) for Model I and II.



Top number from Model I
Bottom number from Model II

Table 6. Comparison of Imputed Price Differences for Live Cattle as Packing Plant Capacity is Added.^{a/}

Region	1 Plant Model I	2 Plants Model II	3 Plants Model III	4 Plants Model IV
	(T. shs. per live cwt.)			
Arusha	8.14	4.07	9.85	8.95
Kilimanjaro	9.25	5.18	8.46	7.56
Tanga	15.23	11.16	13.54	13.54
Coast (Dar)	18.39	14.32	14.51	14.50
Dodoma	9.96	5.89	6.08	6.08
Morogoro	14.74	10.67	10.86	10.86
Singida	6.49	2.42	3.81	2.90
Mbeya	11.90	11.57	11.76	11.76
Iringo	9.59	5.52	5.71	5.71
Mara	0.01	0.25	1.43	0.53
Kigoma	10.15	10.15	10.15	10.15
West Lake	0.00	0.00	0.00	0.00
Mwanza	0.28	2.54	2.54	2.54
Shinyanga	2.41	5.64	5.64	5.64
Tabora	2.28	2.29	2.29	2.29
Mtwara	21.84	17.77	17.96	17.96
Ruvuuma	11.11	7.04	7.23	7.23

^{a/} Price differences are premium prices per cwt. above West Lake. They do not account for shrink and death loss in transporting. Actually in recent years the West Lake area has had a deficit of live cattle and a more accurate price level would probably be a little above Mwanza. Arusha area price would also be higher if live movements into Kenya had been estimated.

Since other production and marketing costs are not included in the models these data show only the change due to location of packing plant capacity, and the relative market price differences by regions due to transportation costs. Export markets in Zaire and Zambia have the highest marginal transportation cost with costs declining in other regions toward the interior of Tanzania, and further toward the Lake Victoria area in the northwest. Specifically, these models assume an open market and the necessary infrastructure to adjust to an optimum marketing solution given the specified availabilities, requirements and transportation costs. Some of the estimates may therefore, be unrealistic, but the analysis does illustrate the general price distribution patterns that would prevail when resources were being used efficiently.

The current (1976) pricing policy for live cattle is a flat minimum price with no direct quality, seasonal or geographic differential. A weight differential is applied that is associated with quality. This policy results in lower quality cattle being shipped long distance by railroad without feed or water. The shrinkage and death losses are unusually high. Furthermore, the policy of fixing maximum retail price by districts or regions creates further distortions, although these prices do recognize a spatial price difference relative to the coast. Some adjustment in geographic pricing has been approved but not operating in July 1976.

When the plant under construction at Shinyanga is completed the price on the coast will still need to be higher, but the difference compared to Model I would be cut to one-half (Table 5).

Finally, results of the analysis support the hypothesis that marketing efficiency can be substantially increased by locating slaughter

capacity in the interior. This result supports the recommendation of the study made for the Ministry of Agriculture and the Development Bank in 1971 (1). If market incentives are adjusted to encourage producers to adopt better production and marketing practices the offtake should increase to allow the industry to supply East African markets with live cattle and beef on a continuing basis.

REFERENCES

1. Tanzanian Ministry of Agriculture, Phase II Livestock Development Project, Vol. IV, Dar es Salaam, November 1971.
2. The United Republic of Tanzania, Tanzania Second Five-Year Plan for Economic and Social Development, Vol. IV, Dar es Salaam, 1969.
3. United Nations, FAO, African Livestock Development Study, Part I, Southern and Central Africa, Vols. I and II, OAU, Addis Abba, July 1973.

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Survey of Traditional Livestock Industry

By G. M. Sullivan and D. E. Farris

It is estimated that approximately 90% of the cattle in Tanzania are raised under traditional management practices. Potential short run and long run benefits from this sector are great in terms of impact of economic development for a large number of people covering over one-third of mainland Tanzania.

The purpose of the survey was to gather primary data concerning the present production and marketing practices of the typical livestock producer and determine what are his problems that hinder commercialization of the livestock industry. A goal of the survey is providing current information for national, regional, and district planners designing immediate, short run, and long range projects to increase productivity and offtake in the traditional herd.

Survey Design

In designing the survey, it was fortunate that within the last three years a national agricultural census had been carried out by the Bureau of Statistics.¹ Using preliminary results on estimated cattle population from this survey and 1967 demographic statistics, regions were retained in the survey if number of cattle per household was greater than two. It was assumed that any region with a ratio of greater than two is a viable commercial cattle area in the short run. Given human and cattle population for each district, the test was again applied in the seven regions which were selected. Only one district, Mpanda, Tabora Region did not remain in the survey. See Table 1a.

¹/A major portion of the credit in the survey design goes to Dr. Michael Sprott, production economist, and Mr. J. Prasad, recent F.A.O. Statistician, Dar es Salaam. Authors are also grateful to Mr. Mpogolo for his permission to use his data and information files and releasing enumerators from his staff to assist in interviewing.

Eighty-nine enumeration areas (E.A.'s) were proportionally distributed first among the seven regions in the survey area according to number of cattle reported in the region as a percentage of the total cattle in the seven regions, and then within each region according to the number of cattle in a district as a percentage of the region's total. The geographic area of an E.A. could vary in size dependent upon the density of the human population. After randomly selecting an E.A. from available sites in a district, a survey site remained in the survey if it could be reasonably assured accessibility by automobile.

For each E.A. there was a complete list of names of people living within the boundaries of the E.A. during the period of 1971-72. Ten household names were randomly selected as primary respondents with ten additional names selected for replacements. Names were retained in the sample on the condition that these people had reported owning cattle when they were interviewed in 1971-72. Ten respondents were required in each survey location, and if ten respondents could not be found from the list of twenty names, the balance was filled by randomly selected individuals from the village. Of a possible 890 respondents selected from the seven regions, 792 respondents were interviewed.

Survey Implementation

The success of the survey must be credited to the cooperation of several government institutions who jointly provided assistance at every level of government. Copies of the names of respondents for each survey site were given to Regional and District Livestock Officials, Regional and District Development Directors, Divisional and Ward Secretaries, and village chairmen prior to arrival of survey team so respondents could be located and informed about the purpose of the survey. In some locations TANU secretaries or veterinarian assistants were

Table la. Regions and Districts Selected on Degree of Potential Commercialization and Allocation of Enumeration Areas.

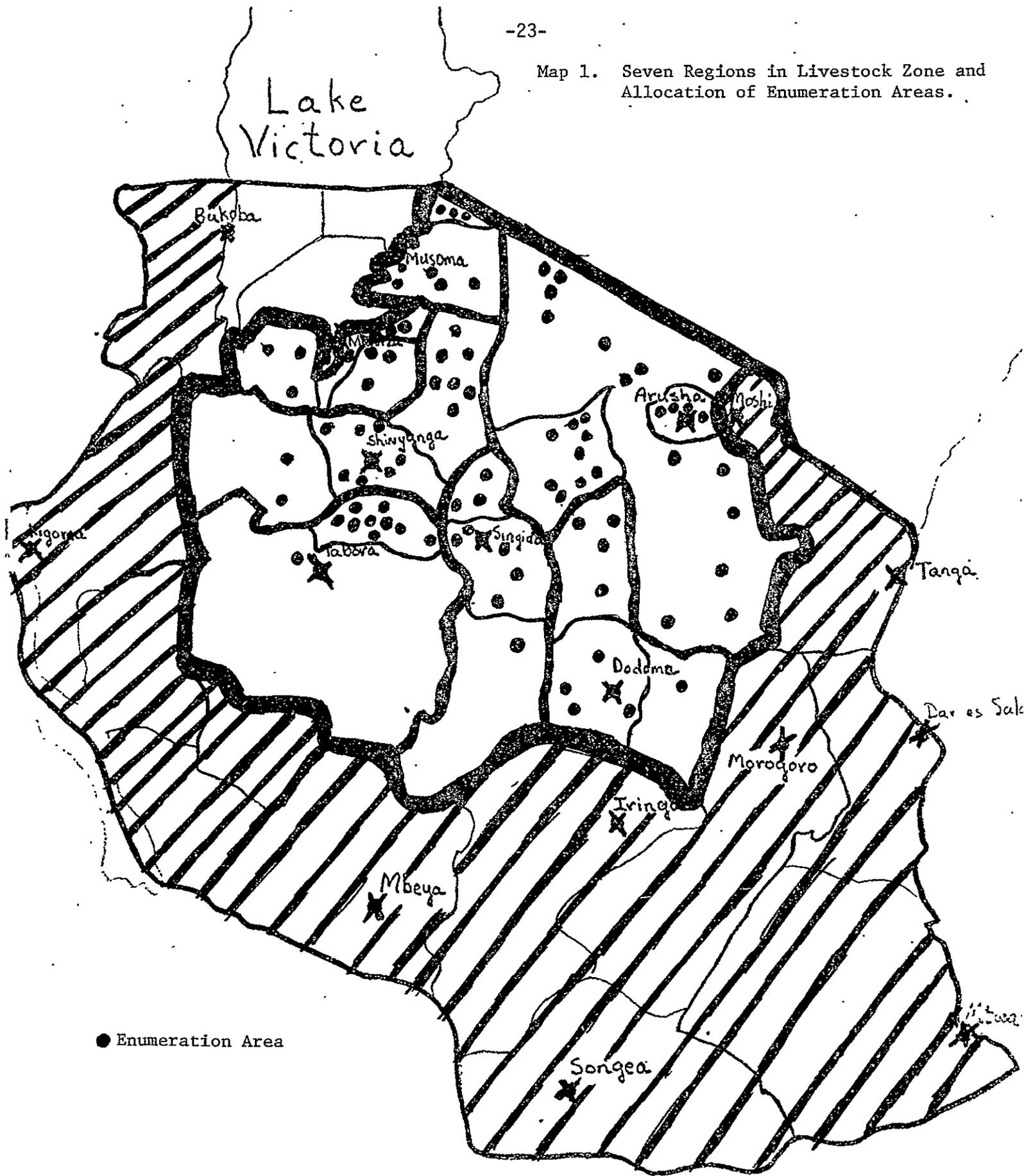
Region	District	Human Population ¹	Cattle Population ²	Cattle/ Household ³	Number of Enumeration Areas
Arusha		610,099	2,376,891	15.58	27
	Arusha	181,728	394,726	8.69	4
	Masai ⁴	106,758	1,238,013	46.39	14
	Mbulu ⁴	289,559	744,152	10.28	9
Coast		511,366	8,986	.07	0
Dodoma		709,311	767,360	4.33	9
	Dodoma	297,400	336,792	4.53	4
	Kondoa	212,111	330,034	6.22	4
	Mpwapwa	176,330	100,534	2.28	1
Iringa		689,610	235,705	1.37	0
Kigoma		473,164	79,438	.67	0
Kilimanjaro		652,678	241,542	1.48	0
Mara		728,715	769,868	4.23	8
	Musoma ⁴	540,175	463,739	3.43	5
	North Mara	188,540	306,129	6.49	3
Mbeya		968,815	422,745	1.75	0
Morogoro		685,192	92,477	.54	0
Mtwara/Lindi		1,040,737	31,942	.12	0
Mwanza		1,055,240	872,777	3.31	10
	Geita	371,108	269,188	2.90	3
	Malya/Kwimba ⁴	305,441	311,653	4.08	3
	Mwanza ⁴	234,907	237,125	4.04	3
	Ukerewe ⁴	109,242	54,811	2.01	1
Ruvumu		393,084	25,818	.26	0
Shinyanga		899,694	1,381,949	6.14	16
	Kahama	147,679	141,115	3.82	2
	Maswa ⁴	430,989	600,179	5.57	7
	Shinyanga	321,006	640,655	7.98	7
Singida		457,772	775,595	6.78	9
	Iramba	183,854	258,668	5.63	3
	Manyoni	80,113	75,549	3.77	1
	Singida	193,786	441,578	9.11	5
Tabora		562,866	872,262	6.20	10
	Mpanda	60,806	259	.02	0
	Nzega ⁴	302,125	757,579	10.03	9
	Tabora	179,043	114,244	2.55	1
Tanga		769,982	176,546	.92	0
West Lake		658,695	164,338	1.00	0
Total Cattle for 7 regions		7,816,843			89
National Herd		9,271,009			

1. 1967 Population Census, Vol. 3. Demographic Statistics, Bureau of Statistics, Ministry of Economic Affairs and Development Planning, Dar es Salaam, 1971.

3. Assumed an average household of four in Mainland Tanzania.

4. Several regions had created new districts so final survey included seven regions and twenty-five districts.

Map 1. Seven Regions in Livestock Zone and Allocation of Enumeration Areas.



able to count respondent's goat, sheep, and cattle before the survey team arrived to substantiate livestock numbers.

Two survey teams were utilized in the implementation of the questionnaire. The first team was composed of employees seconded from the Bureau of Statistics who had previous field experience. They interviewed in Mara, Mwanza, Shinyanga, Tabora, Singida, and Dodoma Regions during the period of August 25th through November 6th. Enumerators traveled as a team in a vehicle supplied by USAID, and daily supervision of interviewing was provided by a sub-sector consultant.

Because of the predominance of Kimasai in the survey areas in Arusha Region, another team of five enumerators who were indigeneous to the area were trained and supervised by a sub-sector consultant. Interviewing was from December 1, 1975 to January 4, 1976 with all interviews conducted during the dry season to have a similar time frame.

Results of Survey

The traditional livestock herd in Tanzania is a multipurpose herd designed for subsistence and survival of the family. It is one of the few methods of accumulating capital and provides a hedge against inflation and protection from starvation. The average size herd was 27.3 head of cattle, 13.7 goats and 9.1 sheep. Wide variation in herd size existed, although the average size for different regions did not vary greatly, it ranged from 21.4 head of cattle in Mwanza to 36.6 in Tabora. Arusha region had the largest variation in herd size (Table 1).

Cattle

The average herd had 11 cows, 3.6 bulls and 2.35 steers. Very few improved breeds of cattle were reported (Table 2). An estimated 65% of the cows had calves

in the past year. This value may have an upward bias if some cows were sold in the past year as it is simply calves born in the last 12 months ÷ cows on hand at time of survey (Table 4). The striking figure is that 28% of the calves died. This varied from 9% in Dodoma region to 50% in the Arusha Region (Table 4). Calves do not generally get adequate nutrition. This was constantly observed by the consultants and documented by the survey. Calves were 10.9 months old on the average, when they were weaned. There was surprisingly little variation in the regional means but considerable variation among herds within regions (Table 6). Despite the lack of adequate nutrition for calves there was essentially no supplemental feeding of grains to calves. Four percent in the Arusha Region reported feeding grain to calves. There was none reported in five of the regions (Table 7).

Water

The primary source of water for livestock in the dry season was streams at 41%, dams and wells were next at 22 and 23 percent of the sources respectively (Table 8). Eighty-three percent of the herdsmen reported that less than 2 hours were required to trek cattle to water during dry season, whereas, it was 91 percent in the wet season (Table 9 and 11). Study of the data documents what was observed on field trips, cattle often have limited time to graze in the dry season as they are on the move to and from grazing and to and from water a considerable amount of time (Table 10).

Animal Health

Despite a government sponsored program of free dipping facilities, only 19% of the respondents dipped their cattle in the last week prior to the interview as is the general recommendation. Twenty-five percent had dipped cattle within the last seven to fourteen days (Table 12). Of the respondents that had not dipped their cattle within the last two weeks prior to the interview, the average time

since last dipping was 4.23 months (Table 13). The reasons that cattle had not been dipped regularly were reported to be: no dipping facilities 36 percent, dip not operating 29%, and dip too far 18% (Table 14). Only 45% of all respondents vaccinated their livestock in the 12 months prior to interview; of these 20% vaccinated for Foot and Mouth disease, 31% vaccinated for Anthrax with about the same number vaccinating for Blackquarter and Rinderpest (Table 16).

Distance to the veterinary center presents a problem in health care, however, 77% reported that less than a half day was required to trek cattle to the center, and 94 percent required no more than a day (Table 17). Only 5% of all respondents had drenched their cattle for internal parasites in the last 12 months (Table 18).

There was 0.64 miscarriages reported per herd in the last 12 months. Actually 181 herdsmen reported an average of 2.82 miscarriages with a standard deviation of 6.9 while 611 did not report any (Table 19).

Marketing

The lack of commercial beef production orientation is reflected by the fact that only 15% of the respondents sold cattle in the last 12 months (Table 20). Of those selling cattle 68% sold at the market place. Practically all of those in Dodoma used the market place, where as, only 33% in the Shinyanga region used the market place (Table 21). Of those selling at the market place 12% sold some cattle outside the organized market, apparently by private treaty (Table 22).

Of those herdsmen selling at a market, 29% reported their primary market being open once a week, 62% were open only once per month (Table 24). The time required to trek cattle to market was a half day or less for 89% of the respondents and less than 2 hours for 34% (Table 25). Water was available on the trek for 49% of the respondents (Table 26); and the same percentage of respondents said a river or stream was their primary source of water on the trek (Table 27). The

number of cattle which were sold or died on the trek proved insignificant (Table 28-29).

Marketing puts stress on cattle, especially when they go without feed and water. Water was available at 47% of the primary markets used by herdsmen marketing cattle (Table 30). The water source at the market was a borehole for only 1% of the respondents (Table 31). Grazing was not available at markets used by 77% of the respondents (Table 32). Once the trip was made to the market 73% never returned cattle from market without selling (Table 33). The main reason for returning cattle without selling was "price too low". Forty-two percent of those selling cattle sold some cattle at their boma in the last 12 months prior to the interview. There was considerable regional variation in this response. More selling occurred at boma's in the Shinyanga Region and the least in the Dodoma Region (Table 35). The reasons for selling cattle at places other than the market was mainly convenience 48%, while a better price was listed by 22% of the respondents (Table 36).

Only 39% of the respondents had sold steers in the last 12 months and the average age of the youngest steer sold was 4.39 years with a standard deviation of 2.03 years while the average age of the oldest steer sold was 5.8 years with a standard deviation of 2.34 years (Table 37 and 38). The reasons given for selling cows were 28% stated that no calf after 3 years and the cow which would bring the highest price were major reasons for selling. Among those selling cattle 17% stated they do not sell cows (Table 39). Among the herdsmen selling cattle during the past 12 months, 65% reported they would not sell more cattle even if the price was TSH 100/- higher than the current price (Table 40). Other information indicates they might be a bit more responsive than this answer indicates, however, this adds further weight to the proposition that these are not commercially oriented herds. Herdsmen stated the first reason for keeping cattle was for milk and the second was to sell during periods of need.

Goats and Sheep

Herdsman who kept cattle also generally kept goats and sheep. In fact, 82 percent of cattlemen interviewed had goats and/or sheep (Table 41). As noted previously, the average herd contained 27.3 cattle, 13.7 goats and 9.1 sheep. Females two years and older accounted for about one-half the total goats and sheep with 6.9 and 4.7 respectively (Table 1). Goats and sheep provide meat for the family, ready cash and considerable flexibility for the herdsman. A larger percentage of respondents in the Mara Region (96%) kept goats or sheep, whereas, only 76% in Arusha Region kept them (Table 41).

Reasons for keeping goats or sheep were reported to be primarily for meat and also for sale. Goats were seldom kept for milk, and goats and sheep were not usually kept for dowry purposes (Table 42), however, they were used for that purpose. Goats and sheep were sometimes traded for food and other animals (Table 42a). Being small they provide a smaller denomination of value needed when cash is not readily available. Slaughtering a goat or sheep for family consumption is convenient because it adequately supplies the family without having a large surplus to dispose of.

Among respondents keeping small stock the average size goat herd was 18.3 head with 9.14 females over 2 years old and only 5.38 kidding during the year. Death loss was 2.6 among the mature female goats. There were 512 cattlemen that also had sheep and the sheep herd consisted of 14.12 head with 7.19 mature females and 4.76 of these had lambs in the last year. Death loss among the mature female sheep was 3.63 head per year (Table 43).

Disposals

The average cattlemen sold 1.43 goats per year, traded .38 and gave for dowry .34 head. Death loss exceeded all methods of disposal at 3.6 head per respondent

and 4.63 per owner of goats (Table 44). Of those owning goats, 2.26 of the dead goats were eaten and 1.7 head were slaughtered and eaten (Table 44). Disposals of sheep were in about the same ratio as goats to the total herd (Table 45). It is clear that small stock are not sold any more frequently than cattle. Among those respondents that actually sold, traded or gave small stock as dowry, several animals were usually involved.

Animal Health

Treatment for parasites and diseases appeared to be closely related to the extent of cattle health care. Forty-four percent of those having small stock had dipped them within the last 12 months (Table 46), whereas, only 8% had vaccinated their small stock (Table 47). Only 2% had treated small stock for parasites in the last 12 months (Table 48). About one miscarriage occurred per herd per year (Table 49).

Marketing

Among the small stock owners only 38% sold goats and 26% sold sheep (Table 50 and 52). About two-thirds of those sold goats at markets and 12% sold to traders (Table 51). Almost the same ratios apply to sheep (Table 53).

Herd Offtake

There have been a variety of attempts to measure offtake of the livestock population of Tanzania. This study measures herd offtake which can be different from slaughter offtake in the country because of the interherd transfers. Nevertheless, the rate of herd offtake is surprisingly higher than previous estimates for the country and it appears that during the twelve months covered by the study, the disposal rate exceeded the replacement rate. Gross offtake including dead cattle eaten was 29.4% for cattle, 35.1% for goats and 42.3% for sheep. Commercial herd offtake was 14.4% for cattle, 13.5% for goats and 10% for sheep; this includes only sales and trades (Table 1b). To the extent livestock are sold and go into other herds these estimates will exceed offtake for slaughter.

Table 1b. Estimated Herd Offtake and Disposals, Livestock Zone, Tanzania 1975.

	<u>Cattle</u>	<u>Goats</u>	<u>Sheep</u>
Inventory (hd.)	27.3	13.7	9.1
Sold ^{b/} (hd.)	3.60	1.47	.83
Traded (hd.)	.34	.38	.08
Slaughtered and Eaten (hd.)	.63	1.33	1.52
Died and Eaten (hd.)	<u>3.46</u>	<u>1.63</u>	<u>1.42</u>
Total Offtake (hd.)	8.03	4.81	3.85
Percent Offtake (%)	29.41	35.11	42.30
Percent Commercial (%)	14.43	13.50	10.00
Dowry and Gifts (hd.)	1.99	.51	.09
Died and Buried (hd.)	3.54	1.33	1.56
Total Disposal (hd.)	13.56	6.65	5.50

a/ All data based on 792 herds.

b/ Includes small amount slaughtered and sold.

Sociological Factors

Since the 1966 F.A.O. East African Livestock Survey recommended a need for greater study into sociological factors affecting the production and marketing of livestock, several detailed surveys have concentrated on particular areas within the livestock zone of Tanzania.^{1/} One goal of this livestock survey was to consider

^{1/}"Masai Range Sociological Survey," supervised by Dr. Colby Hatfield, and "Survey for Modern Ranching in Sukumaland," supervised by G. O. Lange.

the seven major livestock production regions to draw a complete picture of the interrelationship between culture and the production and marketing of livestock in the traditional sector of Tanzania.

Reasons for Keeping Cattle

In the survey, herders were asked what their major reason was for keeping cattle (Table 56 and 57). Table 56 gives a ranking to the responses while Table 57 was for earlier questionnaires where rank of responses were not specified. In Table 56, the majority of respondents in all regions said cattle were held for selling in difficulties except in Mara and Arusha. Cattle are primarily held as a store of wealth in these five regions in case an emergency arises and cash is needed. The cattle herd becomes a hedge against losses from a crop failure where most of the livestock owners are living on a subsistence economy. Cattle also represent a real asset to the producer and the animals do not lose their value during inflationary periods.

The Masai and Baribaic tribes of Arusha Region are semi-pastoral in nature and are more dependent upon their livestock for family sustenance in the form of milk than are many of the other tribes in the livestock zone. Herders in Arumeru District, encompassing the area around Mt. Meru, rely on dairy cattle for sources of cash income in addition to growing cash crops.

From Table 57, respondents in Mara Region said more often they kept cattle for milk. Within the livestock zone, North Mara and Musoma Districts are similar in climatic conditions to Arumeru District in milk production. In Tarime District, North Mara Dairys has a small farmer dairy program with established pick-up points for milk. Dairying in these areas is an established enterprise.

For the second ranked reason, respondents in Mwanza, Shinyanga, Tabora, Singida and Dodoma said they kept cattle for milk while in Arusha store of wealth was given

most often. In Mara Region where respondents did not rank their responses, cattle kept for meat was second in importance to milk. In general, throughout the livestock zone, herders did not slaughter live cattle for meat unless the animal is near death or if there is a customary event, e.g. marriage, funeral, circumcision, etc. when cattle are required to be slaughtered: Goats, sheep, and chickens are usually slaughtered to supply meat for home consumption. (See Table 42.)

Several general conclusions can be drawn: first, in the regions where herders are cropping as well as raising livestock, cattle would be held as a store of wealth to offset periods of difficulties and as a hedge against inflation; second, among the semi-pastoral tribes, cattle provide daily sustenance and, secondly, represent a store of cash for purchasing necessary goods especially foodstuffs (the major purchases of the Masai herders for food supplies (maize flour), cloth, and livestock for increasing and improving their herds); and third, cattle kept as a commercial enterprise which was only in Arumeru District, Arusha Region where improved dairy cows were kept in paddocks. Farmers in this area were receptive to the use of artificial insemination, and utilized cattle efficiently by culling unproductive cattle at an early age.

Source of Cash Income

Sources of cash income for respondents is important to understanding what the role of cattle is in the lifestyles of the people. Crops as a source of cash had over a 69% response rate for those regions around Lake Victoria (Table 58). The major cash crops for this area was cotton, maize, sorghum for beer, dingu, and sunflower seeds. As you approach the drier regions, cash derived from farming dwindles to a low of 9% in Dodoma Region. Farming is subsistence with only food crops grown in Singida, Dodoma, and parts of Tabora Regions. Herders are more dependent on cattle as a source of cash for purchasing food during the dry season until the early crop is harvested. Cattle herds are large and contain unproductive cattle which

either supply meat if they die or provide a source of cash if sold (minimal). Herders in these areas are trying to minimize all risks especially the threat of hunger.

Livestock are a source of cash for 80% of the herders in the livestock zone (Table 58). Only 57% of respondents actually sold cattle in the last 12 months (Table 5). Cattle will only be sold when an actual need for cash occurs and not to cull their herds of unproductive animals.

Herders interviewed had little opportunity for outside sources of cash from either trading or wages (Table 58). There was no opportunity to engage in other forms of employment because of lack of capital or distance to towns. Some herders had large capital reserves in terms of their herd; yet, no incentives existed to encourage these people to utilize their herds to become traders or invest in a small village store. Respondents were keeping large herds to offset their risks in losses from disease, starvation, or theft which could occur at any time. (An example is a herder in Arusha Region who lost over 200 head of cattle in one year from disease and starvation.) Variability in rainfall in the drier regions of Tabora, Singida, Dodoma and Arusha causes risks to fluctuate widely over a short period of time, so herders retain all cattle even past their productive years.

Source of Original Herd

The largest majority of respondents, 50%, acquired their herd by purchasing cattle (Table 59). The herder proves to be a rational economic individual because when surplus cash is available, primarily through farming, buying cattle becomes a form of placing money in a bank. If conditions are favorable, then his investment yields dividends at almost zero cost since his major input is land which is free.

Respondents were asked if they place money in the bank after selling cattle, and 94% said they did not (Table 67). Purchasing livestock with surplus cash is satisfying to the respondent because his investment is visible even though the risks

are increased that the animal might die or be stolen. To the herdsman his risks are minimized because even if his animal dies, the animal can still be eaten. Only if his cattle are stolen will he lose everything.

Cattle received from father or other relative was mentioned 36% of the time by respondents (Table 59). In general, cattle can be given by a father to a son or other relative, but absolute ownership of the cattle belongs to the father until he dies. The son is a caretaker and must consult the father whenever he wants to dispose of a cow. In Arusha Region, the large percentage, 57%, received from relative can be explained by response of the Masai. The family structure, where sons live in the same boma and are solely dependent on father's herd, would more likely dictate that the son receive his original herd from his father.

It is less likely that herders in the livestock zone would acquire their original herd from dowry, since to receive dowry a man must give away a daughter and before this happens he would have acquired cattle if he wanted them. The other responses were doing work and receiving cattle, 5%, and by trading, 11%.

Responsibility for Disposal of Cattle

In all regions it was discovered that decision-making concerning disposal of the herd is communal (Table 61). Though the husband is head of household, 83% of respondents said they must consult at least the wife and most of the time the sons if cattle are to be sold. The only exception is among the Masai who give their women no responsibility in family decision-making concerning the livestock.

In contrast, the Sukuma tribe (primarily Mwanza and Shinyanga Regions) will have wives owning cattle which had been either given as a gift or received in dowry when a daughter marries. The wives will, out of custom, consult with the husband when she wishes to sell and vice versa.

Because of the communal nature in the decision-making process of the herd, improvements, investments, and disposal of cattle must follow customary law, so

personal initiative and motivation could be retarded. Any short or long range plans could become stymied when complex family ownership of a herd prevents cohesive action since a man can have several wives all owning cattle besides himself and herding them together requiring group decision-making.

Dowry and Customary Gifts

One important use of cattle is the payment of bridewealth. For the Livestock Zone, the average number of cattle paid is 13.23 with a standard deviation of 9.78 (Table 62). The largest amount paid is in Shinyanga Region among the Sukuma tribe. In the drier regions of the Livestock Zone, fewer cattle are required for bridewealth; an average bridewealth for Singida, Dodoma, and Arusha Regions is 8.23 head of cattle.

Cattle most frequently mentioned as given in dowry by respondents were cows (57%), heifers (82%) and bulls (82%) (Table 63). In the three drier regions, only heifers and bulls are frequently given in dowry. Cows are primarily retained in herd for supplying milk, and there is a greater demand for heifers to be paid because of expected potential in providing milk for the family.

The majority of respondents (61%) said they would not accept another form of payment of dowry instead of cattle (Table 64). One explanation for the high percentage of "yes" responses in Mwanza and Shinyanga Regions (96% and 71%) is because of the high incidence of cash and a dependency on cotton as a cash crop in these regions. Cash for dowry has increased importance because it is readily convertible for purchase of goods and implements for which there is a demand. In paying dowry, other types of livestock, beer, cloth, or money will be included in the dowry payment besides cattle.

Another customary practice involving livestock is giving cattle to a son so he can begin to care for cattle and have a source of food for his family. Only 10% of the respondents said they had given cattle to a son in the last two years (Table 65). Cattle if given are usually not as a gift but rather as a conditional loan with the

son understanding that he does not own the cattle and cannot dispose of them without the father's request. Of the respondents who gave cattle to their son in the last two years, cows and heifers (67% and 63%) were predominately given followed by bulls (44%) (Table 66). Again the dependency upon cattle for sustenance places a high value on cows and heifers.

Ownership Patterns

Respondents were asked if they own all the cattle which they are presently herding (Table 60). Sixty-three percent of the respondents said they owned all, while twenty-one percent said they owned most, with the remaining 16% owning some or none.

In Tabora, Singida, Dodoma, and Arusha Regions, respondents were asked more specific questions to determine ownership patterns of livestock. In these four regions 41% of the respondents replied that they were keeping someone's cattle (Table 68). The highest response rate was in Dodoma and Singida Regions where conditions are arid and people are not pastoral in grazing patterns. Exchange of livestock is more prevalent.

In the four regions, 53% of the respondents were keeping the livestock of one individual (Table 69) with 65% of the respondents keeping someone's cattle for more than two years (Table 70). A relative, 39%; or friend, 30% were mentioned most often by respondents whose cattle were being kept (Table 71). Fees or rents are rarely paid in the traditional sector for keeping another person's cattle. Therefore, an individual will readily accept someone's cattle because of the supply of milk and meat he receives. Because of low production costs, an incentive exists for individuals to request a relative or friend to allow him to keep some of their cattle in his boma.

Sixty-five percent of the respondents in the four regions said that the individual whose cattle they were herding lived in the same village as the respondent (Table 72). This implies that most livestock are not shifted great distances to other bomas, but remain in the locality of where the owner lives.

The majority of respondents, 30% said they kept someone's cattle for the opportunity to receive milk, 22%, or milk and manure, 21% (Table 73). The importance of manure for farming is crucial to subsistence agriculture in Singida and Dodoma Regions. The soils in these regions are sandy and poor and must be fertilized each year if a crop is to be harvested. Millet is the only major food crop which can produce adequately in these regions. Livestock serve two roles in providing milk for sustenance and manure for the farms.

Finally, 30% of the respondents said they kept cattle because they were requested by a neighbor or relative (Table 73). Customary law requires that any request by another family member or friend must be carried out unless undue hardship can be proven. In a culture where family obligations override economic considerations, inefficiencies in utilization of resources will occur. For example, where a herder was efficiently managing (dipping once a week for example) 20 cattle within his abilities and human resources, now must accept an additional 20 head from a brother and poor management might result (begins to dip once a month or only part of his herd because of the difficulties of dipping all the cattle at once.) Social obligations which are important in family relationships can prove to be causes of inefficiencies in managerial decisions concerning the herd.

Ownership Patterns: Cattle Kept in Other Bomas

In the four regions, only 23% of the respondents said that they are keeping some of their cattle in another boma (Table 74). Singida Region had the highest response rate, 37%, which could be explained by the shortage of water and grazing in the area and the need to shift cattle to other areas. Sixty-four percent of the respondents keeping cattle in other bomas said cattle were kept in one boma only (Table 75).

Thirty-four percent of the respondents said that a relative, other than a father, brother, or son, was most likely to be keeping the respondent's cattle, and 29%

mentioned a friend (Table 76). This is similar to the ownership pattern when respondents were keeping someone's cattle.

When asked if they were keeping their cattle in other bomas located within the village, 78% of the respondents replied they were not (Table 77). This is not consistent with those respondents keeping cattle for individuals who were primarily living in the same village (Table 72). In each of the four regions, a large majority of the respondents had shifted their cattle to other villages.

The average number of cattle kept in other bomas by respondents in the four regions is 20.47 with a standard deviation of 36.28 (Table 78). Some concern exists in the reliability of this number since enumerators were unable to substantiate the number given. Arusha Region because of the Masai tribe has the highest average number, (25.54) with the largest standard deviation (46.01) because of the severe shortage of grass available for cattle during the dry season. Any other conclusions or extrapolation from the data is not advisable.

Eight-seven percent of the respondents keeping cattle in other bomas said they had not been received through customary gifts (Table 79). The implication is cattle must have been taken from the respondent's boma, and a decision to shift cattle had to have been made. The receiving of cattle by customary gifts which have been kept for the respondent is not a major reason for keeping cattle in other bomas.

Only 17% of the respondents for the four regions said they had sold, traded, or paid dowry cattle kept in other bomas in the last 12 months (Table 80). The implication is that cattle given to others for herding are not commercially utilized. Cattle are shifted to other bomas to be maintained as a reserve stock and to minimize production risks. Managerial decisions concerning these cattle are left to the caretaker of the cattle who receive the milk in payment or the meat if the animal dies. (The hide must be returned to the owner as evidence of death.)

With the government villagization program, it was of interest to note if there had been any excessive shifting of cattle to other bomas outside the planned village (Table 81). Only 24% of the respondents replied that they had kept their cattle in other bomas when shifting to their present village. Of the four regions, 53% of the respondents in Arusha Region left cattle outside the villages in another boma.

The major reason for shifting cattle to other bomas by respondents in the four regions was because of a scarcity of grass or water at their present location, 33% (Table 82). Other respondents mentioned, such as minimizing risks of all cattle dying if in one boma 8%, indicate the cattle raiser is rational in his decision-making having calculated what the extent of his risks and outcomes would be given previous experiences and trying to minimize his losses.

In minimizing risks by keeping cattle in other bomas, the producer also provides a source of food for other families. Eighteen percent of the respondents said that individuals requested cattle to receive milk or to receive milk and manure (Table 82). An interrelationship exists between cattle owners and people without cattle..

Analysis by Herd Size

Disposals

Respondent's were grouped into eight classifications by herd size to determine if differences in performance and acceptance of improved practices varies significantly by herd sizes. It was found that the percentage of respondents actually selling cattle in last 12 months increases with increasing herd size from 32% for herds of 0-5 to 94% for herds over 100 (Table 83). Livestock raisers with larger herds would perceive their herd more as a source of cash than smaller size herds who would retain cattle for subsistence.

With increasing herd sizes, percentage of respondents selling steers increases (Table 84). With herds over 50, over fifty percent of the respondents sold a steer

in the last 12 months. If herd sizes of 16-20 and 51-100 are excluded, we notice that larger herds tend to sell steers at a younger age, 3.5 years with a standard deviation of 1.4 years for herds over 100, compared to 4.5 years and standard deviation of 3.8 years for herds of 0-5. Among all herd sizes, it was not uncommon to sell a steer which is between 6 and 11 years old.

In the smaller herd sizes, the number of cattle which died is higher relative to the larger herd sizes (Table 85). For herd sizes of 0-5 and 6-10, the number is over 50% of the animals on hand at time of interview. High death loss among smaller herds places increased uncertainty in reproduction of the herd. Herder's rationale for retaining cattle past their unproductive age is realistic because of the high production risks which he faces.

For all classes of herd sizes, small percentages of cattle are slaughtered for home consumption or sale. It is assumed that since most herder's consume cattle which die, slaughter of live animals is not necessary to provide red meat for the family.

Health Practices

Important in classification of livestock owners is to compare adoption of management practices which might improve the growth of the herd. In general acceptance of regular dipping by respondents was low, but a higher percentage of small herd owners dip their cattle on a regular basis than do larger herd owners (Table 86).

Vaccinations by respondents of their cattle shows no significant difference between herd sizes with approximately 50% of the respondents in each herd group ing vaccinating except for herds between 11-15 where percentage drops to 23% (Table 87). A herd owner can ask the veterinarian field assistant if one resides in the area to visit his herd to vaccinate his animals mainly when sickness occurs.

Whether a herd owner dips his cattle depends on additional conditions as well as whether he understands the importance of regular attendance. The practice of drenching cattle is almost non-existent among herd sizes in Livestock Zone (Table 88).

Sociological

For herd sizes under 15, majority of respondents ranked milk as the first major reason for keeping cattle (Table 89). For herd sizes from 16-50, major importance in keeping cattle shifts to store of wealth, and for herds over 50 importance again becomes milk. Majority of herds over 100 head belong to the Masai tribe who are semi-nomadic and rely on their cattle as a source of food. For the second and third reason given, responses varied among milk, meat, and store of wealth for all herd sizes.

Smaller herd sizes who rely on milk from their cattle do not see them as a source of cash as much as owners of larger herds (Table 90). But as herd size increases, a higher percentage use their livestock as a source of cash. Over 50% respondents with herds less than 35 would be also dependent upon field crops for their source of cash. With herds over 35, respondents are more dependent on their cattle as their sole source of cash income.

Conclusion

Data summarized in the following tables demonstrate that adequate animal health practices are not being followed and these are the result of failure of government programs as well as lack of herdsman initiative. Excessive death loss among calves confirms consultants' observation that calves fail to get adequate nutrition. Commercial herd offtake was 14.4% of inventory for cattle, 13.5% for goats and 10% for sheep. If livestock consumed by owners is included these values jump to 29.4, 35.1 and 42.3 respectively. This is substantially more than previous estimates and

suggest that previous studies were not able to account for much of the sales or consumption.

Management practices and the sociological explanations why producers keep livestock varies significantly by herd size when customary obligations and economic factors affecting the decision-making process of livestock owners in Tanzania are considered. These forces affecting the livestock owner can be described as both internal and external. The internal forces arise from the needs and demands of the herder's immediate family. The social interactions of family members in reaching a unified decision concerning the livestock affects the overall management of the herd.

External forces which affect the decision-making of the livestock owner are diverse but intertwined in molding his behavior patterns. Climate and geophysical factors present continual risks to a producer and stymie any initiative to be innovative. Improved practices which require large capital investments are unrealistic for most producers.

Social obligations within the livestock owner's extended family or from his peers in the same village require the producer to behave in a certain manner, which sometimes is contradictory to improvement in his lifestyle and to the development of his village.

The final external force would be the institutions in which producers must operate. Whether it is the producer's primary market place or his local veterinarian assistant, the livestock producer is responsive to innovation when it can be tailored to the economic risks that he confronts. Government policies are external forces which can have a counter-balancing affect on the other external forces by creating incentives for livestock producers which can improve the economic wellbeing of the individual, his community, and his country.

Table 1 - Composition of the Average Traditional Livestock Herd, Tanzania, 1975.

Region	No. of Sample Cattle Herds	Total Cattle	Cows	Calves	Heifers	Steers	Bulls	Total Goats	Female Goats 2 yr.+
Mara	81	31.9	13.5	5.7	4.4	4.1	4.2	7.6	3.6
Mwanza	100	21.4	8.5	4.6	3.9	0.8	3.7	6.3	3.1
Shinyanga	127	26.4	9.1	5.2	4.6	3.4 ^a	3.6	8.1	4.0
Tabora	94	36.6	14.5	7.4	7.0	2.9	4.7	10.4	4.4
Singida	85	23.4	8.6	4.5	5.7	2.3	3.5	12.5	5.8
Dodoma	78	21.8	8.2	5.2	4.4	.69	3.2	13.1	6.0
Arusha	227	28.4	12.9	4.7	5.4	2.2	3.1	24.4	13.2
7 Region Ave.	792	27.3	11.1	5.2	5.0	2.4	3.6	13.7	6.9

Region	Total Sheep	Female Sheep 2 yr.+	Standard Deviation Total Cattle	Standard Deviation Total Goats	Standard Deviation Total Sheep
Mara	5.5	2.3	35.08	7.5	9.5
Mwanza	6.7	3.6	16.27	7.3	8.5
Shinyanga	9.1	5.0	34.72	9.6	13.0
Tabora	7.4	3.6	36.56	10.3	10.5
Singida	9.5	4.6	18.8	14.9	10.4
Dodoma	4.3	2.1	21.3	14.3	6.9
Arusha	13.8	7.0	54.3	57.0	34.8
7 Region Ave.	9.1	4.7	38.3	32.7	20.8

Table 2: Characteristics of herd in Livestock Zone, August 1975 to January 1976 (page 1)

	Total Cattle			Total Bulls			Immature Bulls			Mature Bulls			Improved Bulls		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	81	31.89	35.08	81	4.20	3.96	a			a			0		
Mwanza Region	100	21.38	16.27	100	3.69	2.90	70	2.03	2.04	70	1.11	1.15	0		
Shinyanga Region	127	26.35	34.72	127	3.63	3.82	80	1.70	2.14	80	1.35	1.74	0		
Tabora Region	94	36.56	38.00	94	4.74	4.46	94	2.67	3.08	94	2.07	2.05	1	3.00	0.0
Singida Region	85	23.44	18.81	85	3.49	3.35	85	2.02	2.26	85	1.47	1.74	0		
Dodoma Region	78	21.78	21.28	78	3.19	3.56	78	1.96	2.49	78	1.23	1.42	0		
Arusha Region	227	28.35	54.30	227	3.14	5.85	227	1.69	3.48	227	1.44	2.76	4	2.25	1.89
TOTAL	792	27.34	38.28	792	3.63	4.45	640	1.93	2.87	640	1.45	2.14	5	2.40	1.67

	Steers			Cows			Improved Cows			Total Heifers			Heifers Over 3 Years		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	81	4.09	7.60	81	13.52	16.49	0			81	4.42	5.32	a		
Mwanza Region	100	.84	1.76	100	8.49	6.31	0			100	3.88	4.04	a		
Shinyanga Region	126	3.40	8.75	127	9.15	13.38	1	2.00	0.0	127	4.61	6.85	78	1.44	2.51
Tabora Region	94	2.87	3.65	94	14.45	18.41	1	6.00	0.0	94	6.96	7.74	92	3.87	4.49
Singida Region	85	2.31	3.65	85	8.56	6.76	0			85	4.65	4.08	85	2.16	2.29
Dodoma Region	78	.69	1.48	78	8.22	7.66	0			78	4.42	6.26	77	1.90	3.10
Arusha Region	227	2.19	7.87	227	12.91	26.28	10	2.00	.67	227	5.35	10.46	227	2.96	6.83
TOTAL	791	2.35	6.35	792	11.08	17.77	12	2.33	1.30	792	4.98	7.55	584	2.52	5.00

^arespondents in these regions were not asked this question.

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table 2: Characteristics of herd in Livestock Zone, August 1975 to January 1976 (page 2)

	Weaned Calves			Unweaned Calves		
	n	x	s	n	x	s
Mara Region	81	1.81	3.63	81	3.89	5.43
Mwanza Region	100	.83	1.48	100	3.72	3.36
Shinyanga Region	127	1.46	2.55	127	3.75	6.30
Tabora Region	94	2.12	5.21	94	5.31	5.79
Singida Region	85	.81	1.38	85	3.64	4.15
Dodoma Region	78	1.12	1.60	78	4.05	4.16
Arusha Region	227	.95	3.09	227	3.74	6.81
TOTAL	792	1.24	3.03	792	3.97	5.66

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 3. Cow-Calf Statistics for Livestock Zone, August 1975 to January 1976

	Cows			Calves Born			Calves Weaned			Calves Not Weaned			Calves Died		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	81	13.52	16.49	81	7.77	9.69	81	1.81	3.63	81	3.89	5.43	81	2.06	3.29
Mwanza Region	100	8.49	6.31	100	6.81	5.64	100	.83	1.48	100	3.72	3.36	100	2.26	2.82
Shinyanga Region	127	9.15	13.38	127	6.94	11.24	127	1.46	2.55	127	3.75	6.30	127	1.74	4.95
Tabora Region	94	14.45	18.41	94	9.01	12.75	94	2.12	5.21	94	5.31	5.79	94	1.55	4.93
Singida Region	85	8.56	6.76	85	5.18	5.16	85	.81	1.38	85	3.64	4.15	85	.72	1.96
Dodoma Region	78	8.22	7.66	78	5.68	5.44	78	1.12	1.60	78	4.05	4.16	78	.49	1.07
Arusha Region	227	12.91	26.28	227	7.86	16.04	227	.95	3.09	227	3.74	6.81	227	3.16	10.74
TOTAL	792	11.08	17.77	792	7.21	11.56	792	1.24	3.03	792	3.97	5.66	792	1.99	6.57

	Calves/ Cow's Life			Months to Wean		
	n	x	s	n	x	s
Mara Region	80	8.95	2.73	79	10.66	3.43
Mwanza Region	99	10.03	2.33	98	11.32	2.19
Shinyanga Region	121	8.28	2.32	125	11.66	3.40
Tabora Region	93	7.23	2.10	94	11.24	2.31
Singida Region	85	8.20	2.35	85	11.67	2.25
Dodoma Region	78	8.62	2.26	77	12.34	2.69
Arusha Region	227	9.00	2.52	220	9.41	3.34
TOTAL	783	8.68	2.51	778	10.90	3.11

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table 4. Herd Percentages by Regions in Livestock Zone, August, 1975 to January, 1976.

	MARA REGION	MWANZA REGION	SHINYANGA REGION	TABORA REGION	SINGIDA REGION	DODOMA REGION	ARUSHA REGION	TOTAL
Total Bulls/Total Cattle	13	17	14	13	15	15	10	13
Immature Bulls/Total Cattle	a	9 ^b	4 ^b	7	9	9	5	7
Mature Bulls/Total Cattle	a	5 ^b	3 ^b	6	6	6	5	5
Steers/Total Cattle	13	4	13	8	10	3	12	9
Cows/Total Cattle	42	40	35	40	37	28	46	41
Heifer/Total Cattle	14	18	17	19	20	20	17	18
Heifer(over three)/Total Cattle	a	a	5	11	9	9	9	9
Calves/Total Cattle	18	21	20	20	19	24	15	19
Immature Bulls/Total Bulls	a	55 ^b	30 ^b	56	58	61	47	53
Mature Bulls/Total Bulls	a	30 ^b	20 ^b	44	42	39	53	40
Cows/Total Females	75	69	66	67	65	65	73	69
Heifers/Total Females	25	31	34	33	35	35	27	31
Heifers(over three)/Total Females	a	a	10	18	16	15	15	16
Calves Born/Cows ^c	57	80	76	62	61	69	65	65
Calves Weaned/Calves Born	23	12	21	24	16	20	10	17
Calves Sucking/Calves Born	50	55	54	59	70	71	40	55
Calves Died/Calves Born	27	33	25	17	14	9	50	28

a) Respondents were not asked this question in this region.

b) Some of the respondents were not asked this question in this region

c) Ratio is calves born in last 12 months to cows in herd at the time of interview. Some upward bias should be expected.

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table 5. Cattle disposals in Livestock Zone, August 1975 to January 1976 (page 1)

	Cattle Sold			Cattle Sold ^b			Cattle Traded			Cattle Traded ^b			Cattle Dowry		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	74	2.28	4.26	38	4.29	5.14	81	.44	1.52	9	4.00	2.64	81	5.58	13.91
Mwanza Region	100	1.86	2.92	56	3.32	3.22	100	.13	.54	7	1.86	1.07	100	1.22	3.27
Shinyanga Region	127	2.79	4.87	69	5.13	5.64	127	.19	.81	10	2.40	1.84	127	1.55	5.65
Tabora Region	94	3.14	7.14	52	5.67	8.84	94	.62	1.57	22	2.64	2.30	94	1.72	5.19
Singida Region	85	2.95	4.07	58	4.33	4.28	85	.48	1.92	13	3.15	4.10	85	.34	1.05
Dodoma Region	78	3.55	4.61	55	5.04	4.76	78	.24	.69	11	1.72	.90	78	1.37	5.34
Arusha Region	227	5.60	13.02	124	10.26	16.22	227	.35	2.21	18	4.39	6.79	227	1.21	4.80
TOTAL	785	3.56	8.20	452	6.19		792	.34	1.59	90	3.00	3.79	792	1.70	6.36

	Cattle Dowry ^b			Total Cattle Died			Cattle Died Buried			Cattle Died Eaten			Slaughter Cattle Eaten		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	20	22.60	20.24	81	5.88	9.36	a			a			81	.78	2.44
Mwanza Region	14	8.71	3.34	100	4.12	4.69	100	.34	1.58	100	3.78	4.56	100	.24	.67
Shinyanga Region	16	12.38	11.18	127	6.91	16.56	123	1.36	11.75	124	5.60	12.54	127	.58	1.70
Tabora Region	18	9.00	8.82	94	3.65	9.62	94	.77	3.42	94	2.88	7.52	94	.55	1.03
Singida Region	11	2.64	1.63	85	2.75	5.61	85	.99	4.46	85	1.76	3.58	85	.78	1.89
Dodoma Region	7	15.28	10.86	78	2.40	3.32	78	.77	2.15	78	1.63	2.62	78	.59	1.18
Arusha Region	37	7.41	9.88	227	15.47	42.16	227	10.51	38.00	227	4.94	12.41	227	.77	4.45
TOTAL	123	10.93	12.68	792	7.63	24.60	722	3.88	22.38	723	3.79	9.47	792	.63	2.73

^a Respondents in Mara Region were not asked these questions.

^b Respondents who actually performed this activity.

Table 5. Cattle disposals in Livestock Zone, August 1975 to January 1976 (page 2)

	Slaughter Cattle Sold			Cattle Stolen			Cattle Gifts		
	n	x	s	n	x	s	n	x	s
Mara Region	81	.27	1.01	81	.58	2.77	81	.22	.67
Mwanza Region	100	.02	.14	100	.07	.33	100	.20	1.07
Shinyanga Region	127	.05	.33	127	.11	.51	127	.24	1.52
Tabora Region	94	.02	.15	94	.23	.75	94	.09	.38
Singida Region	85	.08	.56	85	.91	4.11	85	.53	2.90
Dodoma Region	78	.14	.75	78	.44	1.06	78	.13	.71
Aursha Region	227	.06	.61	227	.80	4.95	227	.44	2.43
TOTAL	792	.08	.57	792	.48	3.15	792	.29	1.80

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table 6. Months to Wean Calves in Livestock Zone, August, 1975 to January, 1976.

	Months to wean calves		
	n	\bar{x}	s
Mara Region	79	10.66	3.43
Mwanza Region	98	11.32	2.19
Shinyanga Region	125	11.66	3.40
Tabora Region	94	11.24	2.31
Singida Region	85	11.67	2.25
Dodoma Region	77	12.34	2.69
Arusha Region	220	9.41	3.34
Total	778	10.90	3.11

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table. 7 Respondents Feeding Grains to Calves in Livestock Zone, August 1975 to January 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	1	1	80	99	81
Mwanza Region			100	100	100
Shinyanga Region			126	100	126
Tabora Region			94	100	94
Singida Region			85	100	85
Dodoma Region			78	100	78
Arusha Region	10	4	217	96	227
Total	11	1	780	99	791

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 8 Source of Water During Dry Season in Livestock Zone, August 1975 to January 1976.

	River Stream		Dam		Wells		Borehole		Springs		Pipeline		Lake	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Mara Region	46	59	9	12	5	6							18	23
Mwanza Region	49	49	36	36	9	9							5	5
Shinyanga Region	66	52	43	34	18	14								
Tabora Region	29	32	35	38	25	27					2	2		
Singida Region	10	12	20	24	49	58	1	1			4	5		
Dodoma Region	10	13	3	4	55	71	1	1	9	12				
Arusha Region	115	51	30	13	20	8	14	6	2	1	45	20		
Total	325	41	176	22	181	23	16	2	11	1	51	6	23	3

	Other		Total Respondents
	n	%	
Mara Region			78
Mwanza Region			99
Shinyanga Region			127
Tabora Region			91
Singida Region	1	1	85
Dodoma Region			78
Arusha Region	1	1	227
Total	2	.2	785

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 9 Time Required to Trek Cattle to Water Yesterday in Livestock Zone, August 1975 to January 1976.^a

	Less than 2 hours		2 hrs. to half day		Half day to 1 day		Don't Know		Bring Water to Cattle		Total Respondents
	n	%	n	%	n	%	n	%	n	%	
Mara Region	70	87	10	12			1	1			81
Mwanza Region	93	93	7	7							100
Shinyanga Region	98	77	29	23							127
Tabora Region	79	86	13	14							92
Singida Region	70	85	12	15							82
Dodoma Region	57	79	15	21							72
Arusha Region	173	80	31	14	2	1	4	2	7	3	217
Total	640	83	117	15	2	.3	5	1	7	1	771

a all interviews were conducted in dry season

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 10 Time Required to Trek Cattle to Grazing During Dry Season in Livestock Zone, August 1975 to January 1976.

	Less Than 2 hours		Two hours to half day		Half day to 1 day		1 day to 2 days		Cattle kept in Paddocks		Total Respondents
	n	%	n	%	n	%	n	%	n	%	n
Mara Region	27	33	54	67							81
Mwanza Region	70	70	30	30							100
Shinyanga Region	69	54	57	45			1	1			127
Tabora Region	53	56	4k	46							94
Singida Region	45	53	40	47							85
Dodoma Region	12	15	63	81	3	4					78
Arusha Region	113	50	92	41	6	2	1	1	15	7	227
Total	381	49	377	48	9	1	2	3	15	2	792

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 11 Time Required to Trek Cattle to Grazing During Wet Season in Livestock Zone,
August 1975 to January 1976.

	Less than two hours		2 hrs. to half day		Cattle kept in Paddocks		Total Respondents
	n	%	n	%	n	%	n
Mara Region	71	88	10	12			81
Mwanza Region	100	100					100
Shinyanga Region	123	97	4	3			127
Tabora Region	89	95	5	5			94
Singida Region	72	85	13	15			85
Dodoma Region	74	95	4	5			78
Arusha Region	194	85	18	8	15	7	227
Total	723	91	54	7	15	2	792

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 12 Cattle Recently Dipped by Respondents in livestock zone, August, 1975 to January, 1976.

	Last Seven Days				Total Respondents n	Last Fourteen Days				Total Respondents n
	Yes		No			Yes		No		
	n	%	n	%		n	%	n	%	
Mara Region	17	21	64	79	81	23	28	58	72	81
Mwanza Region	22	22	78	78	100	28	28	72	72	100
Shinyanga Region	13	10	113	90	126	16	13	110	87	126
Tabora Region	4	4	90	96	94	7	7	87	93	94
Singida Region	22	26	63	74	85	25	29	60	71	85
Dodoma Region	8	10	70	90	78	17	21	61	79	78
Arusha Region	63	28	164	72	227	81	36	146	64	227
Total	149	19	642	81	791	197	25	594	75	791

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 13 Average Time Elapsed Since Last Dipping Cattle in livestock zone, August, 1975 to January, 1976.

	Months ^a	s	Total Respondents
Mara Region	1.35	2.61	52
Mwanza Region	7.75	13.02	68
Shinyanga Region	5.14	10.74	105
Tabora Region	2.73	6.09	85
Singida Region	4.20	6.03	55
Dodoma Region	4.90	6.46	59
Arusha Region	3.55	6.47	138
Total	4.23	8.29	562

a) Respondents are those who have not dipped their cattle in the previous two weeks before the interview.

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table. 14 Reasons cattle had not been dipped regularly in Livestock Zone, August 1975 to January 1976.

	No dipping facilities		Felt there was no need		Some cattle died because of dip		Dip too far		Dip broken		No water in dip		Cattle too weak	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Mara Region	36	82					1	2	2	5	2	5		
Mwanza Region	10	15			1	1	18	26	13	19	11	16	1	1
Shinyanga Region	45	44	2	2	3	3	27	26	8	8	11	11		
Tabora Region	45	52	1	1	3	3	15	17	7	8	4	5	1	1
Singida Region	15	27					10	18	3	5	20	36		
Dodoma Region	9	15					14	23	18	31	12	20	1	2
Arusha Region	42	30	7	5	1	1	15	10	23	16	29	21	11	8
Total	202	36	10	2	8	1	100	18	74	13	89	16	14	2

	Not able to trek cattle		No Medicine		Not Accustomed to dipping		Other		Total Respondents
	n	%	n	%	n	%	n	%	n
Mara Region			1	2			2	4	44
Mwanza Region	10	15	2	3			2	3	68
Shinyanga Region	4	4	2	2	1	1			103
Tabora Region			6	7	1	1	3	3	86
Singida Region	4	7	1	2	1	2	1	2	55
Dodoma Region	4	7			1	2			59
Arusha Region	3	2					9	6	140
Total	25	5	12	2	4	1	17	3	555

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 15. Respondents Who Treat Their Cattle for Diseases in livestock zone, August, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	51	63	30	37	81
Mwanza Region	19	19	81	81	100
Shinyanga Region	30	24	97	76	127
Tabora Region	19	20	75	80	94
Singida Region	46	54	39	46	85
Dodoma Region	25	32	53	68	78
Arusha Region	166	73	61	27	227
Total	356	45	436	55	792

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 16 Livestock Vaccinations in the Livestock Zone During 12 Month Periods Ending August 1975 to January 1976.

	Mature Cattle		Immature Cattle		Goats		Sheep		Donkeys		Total Respondents	
	n	% ^b	n	% ^b	n	% ^b	n	% ^b	n	% ^b	n	% ^a
Foot & Mouth	69	97	62	87	11	15	8	11			71	20
Anthrax	106	95	96	86	26	23	22	20	1	1	112	31
Blackquarter	108	96	99	88	24	21	20	18	2	2	113	32
Anaplasmosis	45	88	37	73	12	24	9	18	1	2	51	14
Nagana	76	93	57	70	12	15	11	13	1	1	82	23
Rinderpest	64	57	100	88	19	17	17	15			113	32
Heartwater	11	92	10	83	3	25	3	25			12	3
Other	5	56	4	44	2	22	1	11			9	3

^a respondents vaccinating their livestock with specified drug as a percentage of the respondents who vaccinated their cattle in the last 12 months

^b types of livestock vaccinated by respondent with specified drug as a percentage of the respondents using that vaccine in the last 12 months

Table. 17 -Time to Trek Cattle to the Nearest Veterinarian Center in Livestock Zone, August 1975 to January 1976.

	Less Than Half Day		Half Day to 1 Day		One day to Two Days		More Than Two Days		Don't Know		No Vet Center		Total Respondents
	n	%	n	%	n	%	n	%	n	%	n	%	n
Mara Region	43	58	10	14	4	5	8	11	6	8	3	4	74
Mwanza Region	80	80	19	19			1	1					100
Shinyanga Region	82	65	37	29	3	2	3	2			2	2	127
Tabora Region	78	83	13	14	3	3							94
Singida Region	80	94	5	6									85
Dodoma Region	71	91	7	9									78
Arusha Region	172	76	40	18	13	6	2	1					227
Total	606	77	131	17	23	3	14	2	6	1	5	1	785

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 18 -Cattle Drenched for Internal Parasites in livestock zone, during 12 month period ending between August, 1975 to January, 1976.

	Yes		No		Don't Know		Total Respondents
	n	%	n	%	n	%	
Mara Region	15	19	66	81			81
Mwanza Region	6	6	94	94			100
Shinyanga Region	4	3	120	96	1	1	125
Tabora Region			93	100			93
Singida Region			85	100			85
Dodoma Region			78	100			78
Arusha Region	15	17	212	93			227
Total	40	5	748	95	1	.1	789

n = sample size (number in sample)

Table 19. Number of cattle having miscarriages in Livestock Zone during 12 month period ending August, 1975 to January, 1976.

	Cattle Miscarriages in last 12 months		
	n	\bar{x}	s
Mara Region	27	2.41	1.99
Mwanza Region	20	1.35	.59
Shinyanga Region	25	2.40	5.78
Tabora Region	33	2.15	2.15
Singida Region	24	1.67	1.20
Dodoma Region	14	1.29	.61
Arusha Region	38	6.05	13.77
Total	181	2.82	6.93

n = sample size (number in sample)

\bar{x} = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table 20. Herdsmen selling cattle in Livestock Zone during 12 month period ending between August, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	40	49	41	51	81
Mwanza Region	56	56	44	44	100
Shinyanga Region	66	52	61	48	127
Tabora Region	52	55	42	45	94
Singida Region	57	67	28	33	85
Dodoma Region	55	71	23	29	78
Arusha Region	123	54	104	46	227
Total	449	57	343	43	792

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 21. Respondents who sold cattle at market place as percent of those who sold cattle in Livestock Zone during 12 month period ending between August, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	22	55	18	45	40
Mwanza Region	31	54	26	46	57
Shinyanga Region	22	33	44	67	66
Tabora Region	27	52	25	48	52
Singida Region	51	89	6	11	57
Dodoma Region	52	95	3	5	55
Arusha Region	102	83	21	17	123
Total	307	68	143	32	450

n = sample size (number in sample)

Table 22. Method of sale of those selling at the market place in livestock zone during 12 month period ending between August 1975 to January 1976

	AUCTION RING				OUTSIDE MARKET				WEIGHBRIDGE				Total Respondents
	n	Yes %	n	No %	n	Yes %	n	No %	n	Yes %	n	No %	
Mara Region	16	73	6	27	4	18	18	82	3	14	19	86	22
Mwanza Region	22	71	9	29	9	29	22	71	1	3	30	97	31
Shinyanga Region	15	68	7	32	5	23	17	77	3	14	19	86	22
Tabora Region	25	93	2	7	2	7	25	93			27	100	27
Singida Region	49	96	2	4	2	4	49	96	1	2	50	98	51
Dodoma Region	47	90	5	10	8	15	44	85	2	4	50	96	52
Arusha Region	98	96	4	4	7	7	95	93	0		102	100	102
TOTAL	272	89	35	11	37	12	270	88	10	3	297	97	307

Table 23. Of those respondents using market, cattle trekked to marketplace but not sold in Livestock Zone during the 12 month period ending between August 1975 to January 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	6	27	16	73	22
Mwanza Region	7	23	24	77	31
Shinyanga Region	5	23	17	77	22
Tabora Region	8	30	19	70	27
Singida Region	12	24	39	76	51
Dodoma Region	11	21	41	78	52
Arusha Region	28	27	74	73	102
TOTAL	77	25	230	75	307

n = sample size (number in sample)

Source: TAMU/USAID Livestock Survey by Personal interview.

Table 24. Of those using market, frequency of primary market operating in livestock zone, August 1975 to January 1976

	Once per Week		Twice per Month		Once per Month		Other		Total Respondents
	n	%	n	%	n	%	n	%	n
Mara Region	1	5	12	55	9	41			22
Mwanza Region	28	90	1	3	2	6			31
Shinyanga Region	17	77	2	9	2	9	1	5	22
Tabora Region	9	33			18	67			27
Singida Region	11	22	1	2	39	76			51
Dodoma Region					52	100			52
Arusha Region	24	24	6	6	69	68	3	3	102
TOTAL	90	29	22	7	191	62	4	1	307

Table 25. Of those respondents using market, time required to trek cattle to market place in livestock zone, August 1975 to January 1976

	Less Than Two Hours		Two Hours to half day		Half day to one day		One day to two days		Total Respondents
	n	%	n	%	n	%	n	%	n
Mara Region			7	100					7
Mwanza Region	3	10	21	70	5	17			30
Shinyanga Region	3	14	14	64	4	18	1	5	22
Tabora Region	4	15	21	78	2	7			27
Singida Region	23	45	28	55					51
Dodoma Region	44	85	8	15					52
Arusha Region	22	22	62	61	10	10	6	6	102
TOTAL	99	34	161	55	21	7	7	2	291

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 26. Available water on trek to primary marketplace in Livestock Zone August 1975 to January 1976

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	11	50	11	50	22
Mwanza Region	22	71	9	29	31
Shinyanga Region	17	77	5	23	22
Tabora Region	15	56	12	44	27
Singida Region	23	45	28	55	51
Dodoma Region	17	33	35	67	52
Arusha Region	45	44	57	56	102
TOTAL	150	49	157	51	307

Table 27. Source of water on trek to market place in livestock zone, August, 1975 to January, 1976.

	River or Stream		Wells		Dams		Borehole		Pipeline		Total Respondents
	n	%	n	%	n	%	n	%	n	%	
Mara Region	7	78					2	22			9
Mwanza Region	10	45	1	5	10	45	1	5			22
Shinyanga Region	9	53	3	18	4	24	1	6			17
Tabora Region	3	23	2	15	7	54			1	8	13
Singida Region	7	30	9	39	7	30					23
Dodoma Region			12	75	2	13	2	12			16
Arusha Region	34	79	1	2	3	7	1	2	4	9	43
TOTAL	70	49	28	20	33	23	7	5	5	3	143

Table 28. Cattle sold during trek to marketplace in Livestock Zone during 12 month period ending between August 1975 to January 1976

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	2	9	20	91	22
Mwanza Region	3	10	28	90	31
Shinyanga Region	1	5	21	95	22
Tabora Region	1	4	26	96	27
Singida Region			51	100	51
Dodoma Region	2	4	50	96	52
Arusha Region	11	11	91	89	102
TOTAL	20	7	287	93	307

Table 29. Number of cattle died or stolen on trek to market in Livestock Zone during period ending between August 1975 to January 1976

	Number Cattle Died	Number Cattle Stolen	Total Respondents
Mara Region	0	0	22
Mwanza Region	0	0	31
Shinyanga Region	0	0	22
Tabora Region	0	0	27
Singida Region	0	0	51
Dodoma Region	0	0	52
Arusha Region	4	1	102
TOTAL	4	1	307

Table 30. Water available at primary market in livestock zone, August, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	7	35	13	65	20
Mwanza Region	25	81	6	19	31
Shinyanga Region	13	59	9	41	22
Tabora Region	12	44	15	56	27
Singida Region	15	29	36	71	51
Dodoma Region	11	21	41	79	52
Arusha Region	61	60	41	40	102
Total	144	47	161	53	305

Table 31. The source of water at primary market in livestock zone, August, 1975 to January, 1976.

	River/Stream		Dam		Well		Borehole		Other		Spring		Pipeline		Total Respondents
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Mara Region	7	100													7
Mwanza Region	3	13	17	71	3	13			1	4					24
Shinyanga Region	7	54	5	38	1	8									13
Tabora Region			4	33	3	25			1	8		4	33		12
Singida Region	2	13	2	13	9	60						2	13		15
Dodoma Region	2	18	3	27	1	9						5	45		11
Arusha Region	35	60	3	5			2	3				18	31		58
TOTAL	56	40	34	24	17	12	2	1	2	2		29	21		140

Table 32. Available grazing at primary market in livestock zone, August, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	13	59	9	41	22
Mwanza Region	20	65	11	35	31
Shinyanga Region	9	41	13	59	22
Tabora Region	4	15	23	85	27
Singida Region	9	18	42	82	51
Dodoma Region	2	4	50	96	52
Arusha Region	15	15	87	85	102
TOTAL	72	23	235	77	307

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 33. Frequency in returning cattle from market without selling in livestock zone during 12 month period ending between August, 1975 and January, 1976.

	Never		Sometimes		Regularly		Total Respondents
	n	%	n	%	n	%	
Mara Region	16	76	5	24			21
Mwanza Region	21	68	8	26	2	6	31
Shinyanga Region	17	77	5	23			22
Tabora Region	19	70	8	30			27
Singida Region	39	76	9	18	3	6	51
Dodoma Region	39	75	13	25			52
Arusha Region	73	72	24	24	4	4	101
TOTAL	224	73	72	24	9	3	305

Table 34. Reason for returning cattle from market place without selling in livestock zone, August, 1975 to January, 1976.

	Price Too Low		Not Enough Buyers		Disorderly Market		Poor Animals		Total Respondents
	n	%	n	%	n	%	n	%	n
Mara Region	2	50					2	50	4
Mwanza Region	10	100							10
Shinyanga Region	4	100							4
Tabora Region	8	100							8
Singida Region	11	92			1	8			12
Dodoma Region	11	84	1	8	1	8			13
Arusha Region	26	93	2	7					28
TOTAL	72	91	3	4	2	3	2	3	79

Table 35. Cattle sold at Boma in livestock zone during 12 month period ending between August, 1975 and January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	24	60	16	40	40
Mwanza Region	32	57	24	43	56
Shinyanga Region	49	74	17	26	66
Tabora Region	30	57	23	43	53
Singida Region	9	16	48	84	57
Dodoma Region	8	15	47	85	55
Arusha Region	36	29	87	71	123
TOTAL	188	42	262	58	450

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 36. Reasons for preferring to sell cattle at other places than at market in livestock zone, August, 1975 to January, 1976.

	Save Time		Better Price		Immediate Problem		Save Time Better Price		Save Time Market Too Far	
	n	%	n	%	n	%	n	%	n	%
Mara Region	9	39	1	4	8	35	2	9	1	4
Mwanza Region	16	50	11	34	2	6	1	3	1	3
Shinyanga Region	31	63	6	12	7	14	1	2	1	2
Tabora Region	18	62	6	21			3	10	1	3
Singida Region	6	67	1	11			1	11		
Dodoma Region	3	37	3	38	1	13				
Arusha Region	7	16	14	32	2	5	5	12	6	14
TOTAL	90	48	42	22	20	10	13	7	10	6

	Market Not Operating		Other		Total Respondents
	n	%	n	%	n
Mara Region			2	9	23
Mwanze Region			1	3	32
Shinyanga Region			3	6	49
Tabora Region			1	3	29
Singida Region			1	11	9
Dodoma Region	1	13			8
Arusha Region	5	12	4	8	43
TOTAL	6	3	12	7	193

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 37. Percentage of those respondents who sold a steer of those who sold cattle during the 12 months period ending between August, 1975 and January, 1976.

	n	Percent
Mara Region	21	53
Mwanza Region	11	20
Shinyanga Region	17	26
Tabora Region	17	33
Singida Region	24	42
Dodoma Region	17	31
Arusha Region	69	56
Total	176	39

Table 38. Average age of steer sold in livestock zone during 12 month period ending between August 1975 to January 1976

	Age of Youngest Steer			Age of Oldest Steer		
	n	\bar{x}	s	n	\bar{x}	s
Mara Region	21	5.29	3.24	21	6.43	3.16
Mwanza Region	11	3.91	.78	11	4.45	1.63
Shinyanga Region	18	4.50	2.52	18	6.11	2.89
Tabora Region	17	4.82	1.70	17	5.59	1.58
Singida Region	24	4.67	2.16	24	6.00	2.60
Dodoma Region	17	4.29	1.65	17	5.82	1.85
Arusha Region	69	3.97	1.53	69	5.68	2.15
TOTAL	176	4.39	2.03	176	5.80	2.34

Table 39. Specified major reason in choosing cows for sale in livestock zone, August 1975 to January 1976

	Bring Highest Price		No. Calf After 3 Yr.		Cow has Miscarriage		Cow is sick		Cow has no milk		Don't Sell Cows	
	n	%	n	%	n	%	n	%	n	%	n	%
Mara Region	13	34	2	5	1	3			2	5	1	3
Mwanza Region	28	50	16	29	3	5			6	11		
Shinyanga Region	21	32	15	23	6	9	2	3	6	9	8	12
Tabora Region	13	25	16	31	2	4			3	6	18	35
Singida Region	17	30	14	25	7	12			1	2	17	30
Dodoma Region	23	42	12	22	3	5			4	7	12	22
Arusha Region	9	7	48	39	13	11	4	3	26	21	19	15
TOTAL	124	28	123	28	35	8	6	1	48	11	75	17

	Other Reason		Has no Preference		No calf After 2 Yrs.		No specified Reason		Total Respondents	
	n	%	n	%	n	%	n	%	n	%
Mara Region							19	50	38	
Mwanza Region							3	5	56	
Shinyanga Region	1	2	1	2			6	9	66	
Tabora Region									52	
Singida Region	1	2							57	
Dodoma Region					1	2			55	
Arusha Region	1	1	1	1	2	2			123	
TOTAL	3	1	2	4	3	1	28	6	447	

Table 40. Respondents who would trek more cattle if cattle prices were TSH 100/- higher at market in livestock zone, August 1975 to January 1976

	Yes		Don't Sell at Market		No		Don't Know		Total Respondents
	n	%	n	%	n	%	n	%	
Mara Region	13	36	1	3	21	58	1	3	36
Mwanza Region	5	9			51	91			56
Shinyanga Region	24	38			38	60	1	2	63
Tabora Region	20	39			31	61			51
Singida Region	18	32			39	68			57
Dodoma Region	29	53			26	47			55
Arusha Region	41	33			82	67			123
TOTAL	150	34	1	.2	288	65	2	.4	441

Table 41. Respondents who keep sheep or goats in livestock zone, August 1975 to January 1976

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	78	96	3	4	81
Mwanza Region	77	77	23	23	100
Shinyanga Region	103	81	24	19	127
Tabora Region	78	83	16	17	94
Singida Region	75	88	10	18	85
Dodoma Region	70	90	8	10	78
Arusha Region	172	76	55	24	227
TOTAL	653	82	139	18	792

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 42. Rank of importance reasons for keeping sheep or goats in livestock zone, August 1975 to January 1976

	FIRST						SECOND						THIRD									
	0	1	2	3	4	5	6	0	1	2	3	4	5	6	0	1	2	3	4	5	6	
Mara Region ^a	63	12		1				76							76							
Mwanza Region ^a	46	30						74			2				76							
Shinyanga Region ^a	52	42		3		1	2	93			7				99							1
Tabora Region ^b	5	67		4		1	1	39	3	1	35				70	1						7
Singida Region	3	56		15		1		30	11	1	32		1		58				1	10	6	
Dodoma Region	1	39		28			2	26	14		28	1		1	51	1			2	7	9	
Arusha Region	4	138	8	21			1	45	27	20	80				143	2	4	19	2	1	1	
TOTAL	174	384	8	72		3	6	383	55	22	184	1	1	1	573	4	4	19	5	18	24	

CODES:

- 0 = No reason identified or multiple reasons given but not ranked
- 1 = For meat
- 2 = For milk
- 3 = For sale
- 4 = For dowry
- 5 = For trade
- 6 = Other

Total Responses

Mara Region	76
Mwanza Region	76
Shinyanga Region	100
Tabora Region	78
Singida Region	75
Dodoma Region	70
Arush Region	172

TOTAL 647

^a Respondents in this region were not asked to rank their multiple responses

^b Only some respondents in this region were asked to rank their multiple responses.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 43. Production Coefficients; goats and sheep in livestock zone, August 1975 to January 1976

	n	Total Goats		Female Goats over 2 years			Females Over 2 years died			Female Goats Kidding		
		\bar{x}	s	n	\bar{x}	s	n	\bar{x}	s	n	\bar{x}	s
Mara Region	73	8.48	7.47	75	3.92	3.42	75	3.45	8.26	75	2.95	2.66
Mwanza Region	68	9.22	7.09	68	4.51	4.06	68	.97	2.71	68	2.51	2.52
Shinyanga Region	91	11.30	9.56	92	5.57	5.63	92	1.49	3.45	92	3.07	2.88
Tabora Region	72	13.51	10.06	72	5.71	4.09	72	.82	1.95	72	3.74	3.17
Singida Region	63	16.83	15.03	63	7.83	7.24	63	1.13	1.84	63	4.83	5.02
Dodoma Region	67	15.24	14.32	67	6.94	6.90	67	1.18	1.98	67	4.25	4.20
Arusha Region	160	34.58	65.51	160	18.66	37.69	160	5.53	11.24	160	10.53	20.48
TOTAL	594	18.31	36.61	598	9.14	20.82	598	2.60	7.05	598	5.38	11.42

	n	Total Sheep		Female Sheep over 2 years			Females over 2 years died			Female Sheep Lambing		
		\bar{x}	s	n	\bar{x}	s	n	\bar{x}	s	n	\bar{x}	s
Mara Region	44	10.07	10.98	45	5.04	5.72	45	7.22	14.34	45	4.11	4.74
Mwanza Region	64	10.44	8.73	64	5.58	5.12	64	1.38	2.10	64	3.05	2.79
Shinyanga Region	91	12.69	13.76	92	6.90	9.18	92	2.13	4.66	92	3.84	3.43
Tabora Region	57	12.19		57	5.88	4.81	57	1.05	2.49	57	3.30	2.87
Singida Region	59	13.64	10.00	59	6.64	4.82	59	1.34	1.94	59	4.15	3.58
Dodoma Region	48	7.06	7.64	48	3.40	3.17	48	.60	1.32	48	2.00	2.08
Arusha Region	150	20.83	41.11	150	10.61	20.59	150	7.27	15.90	150	7.93	15.84
TOTAL	512	14.12	24.44	515	7.19	12.47	515	3.63	10.23	515	4.76	9.21

n = sample size (number in sample)

\bar{x} = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 44. Goat disposals in livestock zone, during 12 month period ending between August 1975 to January 1976 (page 1)

	Goats Sold			Goats Sold *			Goats Sold**			Goats Traded			Goats Traded*		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	81	.42	1.14	76	.45	1.17	13	2.62	1.57	81	.19	1.67	76	.20	1.72
Mwanza Region	100	.58	2.53	70	.83	3.00	9	6.44	6.06	100	.14	1.03	70	.20	1.23
Shinyanga Region	127	.74	3.05	95	.99	3.49	18	5.22	6.66	127	.41	2.04	95	.55	2.35
Tabora Region	94	.40	1.09	73	.52	1.21	18	2.11	1.64	94	.59	2.61	73	.75	2.95
Singida Region	85	1.64	3.72	67	2.07	4.08	36	3.86	4.93	85	.87	3.26	67	1.10	3.64
Dodoma Region	78	2.76	4.29	73	2.95	4.37	41	5.24	4.68	78	.91	2.74	73	.97	2.82
Arusha Region	227	2.44	5.99	165	3.35	6.81	62	8.92	8.62	227	.08	.80	165	.12	.93
TOTAL	792	1.43	4.12	619	1.83	4.58	197	5.74	6.59	792	.38	2.00	619	.48	2.26

	Goats Traded **			Goats Dowry			Goats * Dowry			Goats ** Dowry			Goats Died		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	1	15.00	0.0	81	.33	1.84	76	.36	1.90	7	3.86	5.43	76	5.86	18.07
Mwanza Region	3	4.67	4.62	100	0.0	0.0	70	0.0	0.0	0		0.0	70	1.93	4.96
Shinyanga Region	9	5.78	5.56	127	.12	1.24	95	.16	1.44	2	7.50	9.19	95	2.89	6.39
Tabora Region	10	5.50	6.36	94	0.0	0.0	73	0.0	0.0	0			73	2.14	4.68
Singida Region	13	5.69	6.68	85	.11	.54	67	.13	.60	4	2.25	1.25	67	3.00	5.55
Dodoma Region	14	5.07	4.65	78	1.08	5.23	73	1.15	5.40	5	16.80	14.02	73	3.86	8.67
Aursha Region	4	4.75	4.27	227	.61	4.63	165	.84	5.41	11	12.55	17.86	165	8.32	17.62
TOTAL	54	5.56	5.54	792	.34	3.09	619	.44	3.48	29	9.41	13.43	619	4.63	12.32

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table 44. Goats disposals in livestock zone, during 12 month period ending between August 1975 to January 1976 (page 2)

	Goats Died Buried			Goats Died Eaten			Goats Slaughtered Eaten			Goats Slaughtered Sold			Goats stolen		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	35	0.0	0.0	35	0.0	0.0	76	2.47	6.74	76	.12	.92	76	.74	2.40
Mwanza Region	70	.10	.39	70	1.83	4.96	70	.71	1.14	70	0.0	0.0	70	.21	1.08
Shinyanga Region	89	.63	2.50	89	1.61	3.74	95	1.97	3.80	95	.06	.52	95	.33	1.24
Tabora Region	73	.93	2.93	73	1.21	2.84	73	.77	1.20	73	0.0	0.0	73	.12	.47
Singida Region	67	1.82	4.15	67	1.18	3.84	67	1.69	3.87	67	0.0	0.0	67	1.33	2.87
Dodoma Region	73	1.97	7.84	73	1.89	4.27	73	1.00	2.56	73	.14	.95	73	.88	2.28
Arusha Region	165	3.99	9.53	165	4.33	14.86	165	2.34	4.02	165	.01	.08	165	1.30	3.57
TOTAL	572	1.84	6.34	572	2.26	8.69	619	1.70	3.89	619	.04	.50	619	.77	2.49
	Goats Gifts														
	n	x	s												
Mara Region	76	.36	1.29												
Mwanza Region	70	.24	1.80												
Shinyanga Region	95	.07	.44												
Tabora Region	73	.03	.23												
Singida Region	67	.04	.37												
Dodoma Region	73	.14	.67												
Arusha Region	165	.44	2.32												
TOTAL	619	.22	1.46												

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 45. Sheep disposals in livestock zone during 12 month period ending between August 1975 to January 1976 (page 1)

	Sheep Sold			Sheep Sold*			Sheep Sold**			Sheep Traded			Sheep Traded*		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	81	.74	4.52	48	1.25	5.84	8	7.50	13.24	81	.01	.11	48	.02	.14
Mwanza Region	100	.38	2.11	68	.56	2.54	6	6.33	6.53	100	.14	.71	68	.21	.86
Shinyanga Region	127	.85	2.55	97	1.11	2.88	24	4.50	4.31	127	.19	1.11	97	.25	1.27
Tabora Region	94	.22	.73	58	.36	.91	10	2.10	1.10	94	.07	.53	58	.12	.68
Singida Region	85	1.15	2.74	61	1.61	3.12	27	3.63	3.85	85	.18	.77	61	.25	.91
Dodoma Region	78	.32	.78	52	.48	.92	16	1.56	1.03	78	0.0		52	0.0	
Arusha Region	227	1.31	5.05	159	1.87	5.95	41	7.24	10.00	227	.02	.13	159	.03	.16
TOTAL	792	.82	3.47	543	1.19	4.14	132	4.90	7.25	792	.08	.61	543	.12	.73

	Sheep Traded**			Sheep Dowry			Sheep Dowry*			Sheep Dowry**			Total Sheep Died		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	1	1.00	0.0	81	.09	.55	48	.15	.71	2	3.50	.71	48	8.42	14.64
Mwanza Region	6	2.33	1.97	100	.01	.10	68	.01	.12	1	1.00	0.0	68	2.18	3.74
Shinyanga Region	5	4.80	3.35	127	.03	.35	97	.04	.41	1	4.00	0.0	97	3.70	7.39
Tabora Region	3	2.33	2.31	94	0.0	0.0	58	0.0	0.0	0		0.0	58	3.05	6.82
Singida Region	6	2.50	1.76	85	.11	.54	61	.15	.63	4	2.25	1.26	61	3.26	5.55
Dodoma Region	0			78	.23	1.51	52	.35	1.85	2	9.00	4.24	52	1.17	2.06
Arusha Region	4	1.00	2.0	227	.14	.83	159	.19	.99	10	3.10	2.69	159	9.42	19.40
TOTAL	25	2.60	2.31	792	.09	.71	543	.13	.86	20	3.50	2.93	543	5.24	12.59

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table 45. Sheep disposals in livestock zone during 12 month period ending between August 1975 to January 1976 (page 2)

	Sheep Died Buried			Sheep Died Eaten			Sheep Slaughtered Eaten			Sheep Slaughtered Sold			Sheep Stolen		
	n	x	s	n	x	s	n	x	s	n	x	s	n	x	s
Mara Region	22	0.0	0.0	22	0.0	0.0	48	3.96	9.34	48	0.0	0.0	48	.88	1.93
Mwanza Region	68	.18	.79	68	2.00	3.75	68	.75	1.18	68	0.0		68	.09	.45
Shinyanga Region	92	.77	2.26	92	2.32	6.14	97	2.34	6.70	97	0.0	0.0	97	.61	1.80
Tabora Region	58	2.02	6.19	58	1.03	2.03	58	.79	1.35	58	0.0	0.0	58	.33	1.13
Singida Region	61	2.20	5.47	61	1.61	5.32	61	1.61	5.32	61	0.0		61	1.28	4.63
Dodoma Region	52	.81	1.85	52	.37	1.03	52	.62	1.36	52	.15	1.11	52	.75	1.55
Arusha Region	159	5.43	13.11	159	3.99	12.37	159	1.64	3.82	159	0.0	0.0	159	1.19	3.51
TOTAL	512	2.42	8.17	512	2.20	7.66	543	1.66	4.93	543	.01	.34	543	.80	2.72

	Sheep Gifts		
	n	x	s
Mara Region	48	.63	1.99
Mwanza Region	68	.10	.46
Shinyanga Region	97	.07	.46
Tabora Region	58	.02	.13
Singida Region	61	.10	.40
Dodoma Region	52	0.0	
Arusha Region	159	.20	1.05
TOTAL	543	.15	.88

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 46. -Respondents dipping sheep or goats in livestock zone during 12 month periods ending between August, 1975 to January, 1976.

	Yes		No		Don't Know		Total Respondents
	n	%	n	%	n	%	
Mara Region	36	47	41	53			77
Mwanza Region	49	64	28	36			77
Shinyanga Region	28	27	75	73			103
Tabora Region	13	17	65	83			78
Singida Region	32	43	43	57			75
Dodoma Region	27	39	43	61			70
Arusha Region	103	60	68	40	1	1	172
Total	288	44	363	57	1	.2	652

Table 47. -Vaccinations of sheep and goats in livestock zone during 12 month periods ending between August, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	5	6	72	94	77
Mwanza Region			77	100	77
Shinyanga Region	1	1	102	99	103
Tabora Region	3	4	75	96	78
Singida Region	12	16	63	84	75
Dodoma Region	9	13	61	87	70
Arusha Region	20	12	152	88	172
Total	50	8	602	92	652

Table 48. Treatment of sheep or goats for internal parasites in livestock zone during 12 month periods ending between August, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	7	9	70	91	77
Mwanza Region	3	4	74	96	77
Shinyanga Region			103	100	103
Tabora Region			78	100	78
Singida Region			75	100	75
Dodoma Region			70	100	70
Arusha Region	4	2	168	98	172
Total	14	2	638	98	652

Table 49. Number of miscarriages for sheep and goats in livestock zone during 12 month period ending between August 1975 to January 1976

	Goats Miscarriages			Sheep Miscarriages		
	n	\bar{x}	s	n	\bar{x}	s
Mara Region	75	.71	1.65	48	.77	1.88
Mwanza Region	68	.40	.79	64	.42	.99
Shinyanga Region	92	.55	1.39	92	.52	1.39
Tabora Region	71	.21	.67	56	.34	1.39
Singida Region	63	.70	1.39	59	.54	.97
Dodoma Region	67	.60	1.24	48	.23	.69
Arusha Region	159	2.55	9.19	151	1.97	6.06
TOTAL	595	1.07	4.94	518	.91	3.50

n = sample size (number in sample)

\bar{x} = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 50 Respondents who sell goats in livestock zone, August, 1975 to January, 1976.

	Yes		No		No Goats		Total Respondents
	n	%	n	%	n	%	
Mara Region	38	49	37	47	3	4	78
Mwanza Region	9	12	59	77	9	12	77
Shinyanga Region	20	19	72	70	11	11	103
Tabora Region	17	22	55	71	6	8	78
Singida Region	40	53	24	32	11	15	75
Dodoma Region	43	61	25	36	2	3	70
Arusha Region	79	46	82	48	11	6	172
Total	246	38	354	54	53	8	653

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 51. Where respondents sell goats in livestock zone, August, 1975 to January, 1976.

	AT MARKET				TO TRADERS				TO FRIENDS				Total Respondents
	Yes		No		Yes		No		Yes		No		
	n	%	n	%	n	%	n	%	n	%	n	%	
Mara Region	25	66	13	34	3	8	35	92	22	58	16	42	38
Mwanza Region	7	78	2	22			9	100	3	33	6	67	9
Shinyanga Region	6	30	14	70	2	10	18	90	14	70	6	30	20
Tabora Region	4	24	13	76	3	18	14	82	11	65	6	35	17
Singida Region	29	73	11	27	5	12	35	88	8	20	32	80	40
Dodoma Region	40	93	3	7	1	2	42	98	9	21	34	79	43
Arusha Region	54	68	25	32	15	19	64	81	16	20	63	80	79
Total	165	67	81	33	29	12	217	88	83	34	163	66	246

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 52. Respondents Who Sell Sheep in Livestock Zone, August 1975 to January 1976.

	Yes		No		Don't Have		Total Respondents
	n	%	n	%	n	%	
Mara Region	22	28	24	31	32	41	78
Mwanza Region	6	8	59	77	12	16	77
Shinyanga Region	23	22	70	68	10	10	103
Tabora Region	12	15	45	58	21	27	78
Singida Region	29	39	30	40	16	21	75
Dodoma Region	18	26	31	44	21	30	70
Arusha Region	62	36	91	53	19	11	172
Total	172	26	350	54	131	20	653

Table 53. -Where respondents sell sheep in livestock zone, August, 1975 to January, 1976.

	At Market				To Traders				To Friends				Total Respondents
	Yes		No		Yes		Yes		Yes		No		
	n	%	n	%	n	%	n	%	n	%	n	%	
Mara Region	16	73	6	27%	1	5	21	95	11	50	11	50	22
Mwanza Region	4	67	2	33%			6	100	3	50	3	50	6
Shinyanga Region	10	43	13	57%	1	4	22	96	14	61	9	39	23
Tabora Region	5	42	7	58%			12	100	8	67	4	33	12
Singida Region	18	62	11	38%	5	17	24	83	8	28	21	72	29
Dodoma Region	16	89	2	11%	1	6	17	94	5	28	13	72	18
Arusha Region	41	66	21	34%	12	19	50	81	15	24	47	76	62
Total	110	64	62	36%	20	12	152	88	64	37	108	63	172

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 54. Respondents trading sheep and goats for other goods in livestock zone, August, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	26	33	52	67	78
Mwanza Region	12	16	65	84	77
Shinyanga Region	22	21	81	79	103
Tabora Region	11	14	67	86	78
Singida Region	22	29	53	71	75
Dodoma Region	24	34	46	66	70
Arusha Region	25	15	143	85	168
Total	142	22	507	78	649

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 55. Goods Received in Exchange for Sheep and Goats in Livestock Zone, August 1975 to January 1976.

	For Food				For Clothes				For Animals				For Other Goods			
	Yes		No		Yes		No		Yes		No		Yes		No	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Mara Region	18	69	8	31	4	15	22	85	14	54	12	46			26	100
Mwanza Region	8	67	4	33			12	100	4	33	8	67			12	100
Shinyanga Region	11	50	11	50	1	5	21	95	14	64	8	36			22	100
Tabora Region	7	64	4	36			11	100	4	36	7	64			11	100
Singida Region	16	73	6	27			22	100	8	36	14	64			22	100
Dodoma Region	15	63	9	37			24	100	14	58	10	42			24	100
Arusha Region	12	50	12	50	3	13	21	88	15	63	9	38			24	100
Total	87	62	54	38	8	6	133	94	73	52	68	48			141	100

	Total Respondents
Mara Region	26
Mwanza Region	12
Shinyanga Region	22
Tabora Region	11
Singida Region	22
Dodoma Region	24
Arusha Region	24
Total	141

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 56. Rank in importance, reasons given for keeping cattle in livestock zone, August, 1975 to January, 1976.

Code:	First							Second							Total Respondents		
	0	1	2	3	4	5	6	7	0	1	2	3	4	5		6	7
Mara Region ^a	76			3		1	1		80	1							
Mwanza Region	1	22		67	8	1			76	14	1	2		6			
Shinyanga Region	18	22	1	77	6		3		79	23	5	7	5	4	4		
Tabora Region	5	22		64	3				40	26	6	11	3	2	5	1	
Singida Region		32		51	2				15	21	4	17	5	1	21	1	
Dodoma Region		28	1	42	7				11	25	2	22	7		9	2	
Arusha Region	1	209		9	4	1	3		48	15	53	107	3		1		
Total	101	335	2	313	30	3	7		349	125	71	166	23	13	40	4	

Code:	Third							Fourth							Total Respondents		
	0	1	2	3	4	5	6	7	0	1	2	3	4	5		6	7
Mara Region	80							1	81								81
Mwanza Region	87	7	3		2				99								99
Shinyanga Region	96	8	17		2	1	2	1	125		2						127
Tabora Region	54	10	14	2	6	1	7		86		1				7		94
Singida Region	40	8	8	3	4	2	18	2	69		5		1		9	1	85
Dodoma Region	33	13	9	2	3	2	14	2	62		7			2	7		78
Arusha Region	129	1	62	20	5	8	2		215		2	1	6	2		1	227
Total	519	47	113	27	22	14	44	5	737		17	1	7	4	23	2	791

Codes:

- | | | | |
|---|---|---|---------|
| 0 | No reason identified or multiple reasons given but not ranked | 4 | Custom |
| 1 | Kept for milk | 5 | Dowry |
| 2 | Kept for meat | 6 | Farming |
| 3 | Selling in difficulties | 7 | Other |

a) Respondents in this region were not asked to rank their multiple responses.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 57. Unspecified Reasons for Keeping Cattle in Livestock Zone, August 1975 to January 1976.

	No reason identified		kept for milk		kept for meat		Kept for selling in difficulties		
	n	%	n	%	n	%	n	%	
Mara Region	96	30	70	22	48	15	31	10	
Mwanza Region ^a	261	66	44	11	4	1	70	18	
Shinyanga Region	264	52	71	14	37	7	93	18	
Tabora Region	174	46	60	15	22	6	80	21	
Singida Region	124	36	61	18	17	5	71	21	
Dodoma Region	107	34	65	21	19	6	66	21	
Arusha Region	391	43	226	25	118	13	137	15	
TOTAL	1417	45	597	19	265	8	548	17	

	Custom		Dowry		Farming		Other		Total Respondents
	n	%	n	%	n	%	n	%	
Mara Region	32	10	11	3	28	9	8	3	81
Mwanza Region ^a	10	3	7	2					99
Shinyanga Region	19	4	8	2	14	3	2	4	127
Tabora Region	12	3	4	1	21	6	3	1	94
Singida Region	12	4	3	1	48	14	4	1	85
Dodoma Region	17	5	4	1	30	10	4	2	78
Arusha Region	18	2	11	1	6	1	1	1	227
TOTAL	120	4	48	2	147	5	22	1	791

^a One respondent was not asked this question in this region.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 58. Respondents' sources of cash income in livestock zone, August, 1975 to January, 1976.

	Crops				Livestock				Trade				Wages				Others			
	Yes		No		Yes		No		Yes		No		Yes		No		Yes		No	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Mara Region	77	95	4	5	73	90	8	10	4	5	77	95	2	2	79	98	4	5	77	95
Mwanza Region	77	77	23	23	94	94	6	6	3	3	97	97	2	2	98	98			100	100
Shinyanga Region	87	69	40	31	104	82	23	18	2	2	125	98	4	3	123	97			127	100
Tabora Region	34	36	60	64	78	83	16	17	2	2	92	98			94	100	1	1	93	99
Singida Region	33	39	52	61	72	85	13	15	7	8	78	92	4	5	81	95	1	1	84	99
Dodoma Region	7	9	71	91	63	81	15	19	8	10	70	90	3	4	75	96	1	1	77	99
Arusha Region	106	47	121	53	154	68	73	32	7	3	220	97	20	9	207	91	2	1	225	99
Total	421	53	371	47	638	81	154	19	33	4	759	96	35	4	757	96	9	1	783	99

	Total Respondents
Mara Region	81
Mwanza Region	100
Shinyanga Region	127
Tabora Region	94
Singida Region	85
Dodoma Region	78
Arusha	227
Total	792

Table 59. Source of Original Herd for Respondents in Livestock Zone, August 1975 to January 1976.

	Dowry				Purchase				Received from Relative				Labor			
	Yes	%	No	%	Yes	%	No	%	Yes	%	No	%	Yes	%	No	%
Mara Region					41	51	40	49	31	38	50	62	2	2	79	98
Mwanza Region					56	58	41	42	32	33	65	67			97	100
Shinyanga Region					68	54	58	46	28	22	98	78			126	100
Tabora Region					48	51	46	49	29	31	65	69			94	100
Singida Region	13	17	63	83	43	57	33	43	15	20	61	80			76	100
Dodoma Region	9	13	60	87	35	51	34	49	12	17	57	83	1	1	68	99
Arusha Region	4	2	218	98	95	43	127	57	127	57	95	43	2	1	220	99
Total	130	17	635	83	386	50	379	50	274	36	491	64	5	1	760	99

	Trade				Other				Total Respondents
	Yes	%	No	%	Yes	%	No	%	
Mara Region	4	5	77	95			81	100	81
Mwanza Region	5	5	92	95			97	100	97
Sinyanga Region	17	13	109	87			126	100	126
Tabora Region	25	27	69	73			94	100	94
Singida Region	16	21	60	79			76	100	76
Dodoma Region	15	22	54	78			69	100	69
Arusha Region	2	1	220	99			222	100	222
Total	84	11	681	89			765	100	765

Table 60. Ownership of the Cattle Kept by Respondents in Livestock Zone, August 1975 to January 1976.

	All		Most		Some		None		Total Respondents
	n	%	n	%	n	%	n	%	
Mara Region	35	43	39	48	7	9			81
Mwanza Region	67	67	24	24	6	6	3	3	100
Shinyanga Region	105	83	15	12	6	5	1	1	127
Tabora Region ^a	60	64	21	22	12	13			93
Singida Region	34	40	18	21	24	28	9	11	85
Dodoma Region	32	41	18	23	19	24	9	12	78
Arusha Region	164	72	34	15	23	10	6	3	227
Total	497	63%	169	21%	97	12%	28	4%	791

^a One respondent in Tabora Region had recently given his cattle to his neighbor and was not included in this question.

Table 61. Responsibility to sell or Dispose of Cattle in Livestock Zone, August 1975 to January 1976.

	Husband		Wife		Family		You & Owner		Owner.		Total Respondents
	n	%	n	%	n	%	n	%	n	%	
Mara Region	16	20	1	1	64	79					81
Mwanza Region	8	8			90	90			2	2	100
Shinyanga Region	12	9			114	90	1	8			127
Tabora Region	4	4	1	1	89	95					94
Singida Region	1	1			78	92	6	7			85
Dodoma Region	1	1			61	78	9	12	7	9	78
Arusha Region	55	24	7	3	163	72	1	1	1	1	227
Total	97	12	9	1	659	83	17	2	10	1	792

source: TAMU/USAID Livestock Survey by Personal Interview.

Table 62. Number of cattle given for dowry in livestock zone, August, 1975 to January, 1976.

	x	s	Total Respondents
Mara Region	21.86	10.63	81
Mwanza Region	12.99	3.42	99
Shinyanga Region	22.93	8.64	126
Tabora Region	15.87	9.59	92
Singida Region	6.33	4.05	85
Dodoma Region	11.40	6.18	78
Arusha Region	6.96		225
Total	13.23	9.78	786

Table 63. Types of cattle most frequently given in dowry in livestock zone, August, 1975 to January, 1976.

	Cows				Calves				Heifers			
	Yes		No		Yes		No		Yes		No	
	n	%	n	%	n	%	n	%	n	%	n	%
Mara Region	52	65	28	35	45	56	35	44	68	85	12	15
Mwanza Region	99	99	1	1	62	62	38	38	99	99	1	1
Shinyanga Region	119	94	8	6	82	65	45	35	120	94	7	6
Tabora Region	91	99	1	1	78	85	14	15	88	96	4	4
Singida Region	15	18	70	82	29	34	56	66	76	89	9	11
Dodoma Region	36	47	41	53	26	34	51	66	71	92	6	8
Arusha Region	38	17	189	83	25	11	202	89	125	55	102	45
Total	450	57	338	43	347	44	441	56	647	82	141	18

	Bulls				Steers				Total Respondents
	Yes		No		Yes		No		
	n	%	n	%	n	%	n	%	
Mara Region	68	85	12	15	50	63	30	38	80
Mwanza Region	97	97	3	3	14	14	86	86	100
Shinyanga Region	121	95	6	5	26	20	101	80	127
Tabora Region	88	96	4	4	4	4	88	96	92
Singida Region	72	85	13	15	2	2	83	98	85
Dodoma Region	63	82	14	18	4	5	73	95	77
Arusha Region	134	59	93	41	109	48	118	52	227
Total	643	82	145	18	209	27	579	73	788

Table 64. -Payment of Dowry in Other Forms Except Cattle in Livestock Zone, August, 1975 to January 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	44	54	37	46	81
Mwanza Region	96	96	4	4	100
Shinyanga Region	90	71	37	29	127
Tabora Region	24	26	70	74	94
Singida Region	13	15	72	85	85
Dodoma Region	16	21	62	79	78
Arusha Region	23	10	202	90	225
Total	306	39%	484	61%	790

Table 65. -Cattle Given to Son as Customary Gift in Livestock Zone During 24 Month Periods Ending Between August 1975 and January 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region	14	17	67	83	81
Mwanza Region	9	9	91	91	100
Shinyanga Region	8	6	118	94	126
Tabora Region	2	2	92	98	94
Singida Region	1	1	84	99	85
Dodoma Region	5	6	73	94	78
Arusha Region	40	18	186	82	226
Total	79	10	711	90	790

Table 66. Types of cattle given to son as customary gift in livestock zone during 24 month periods ending between August, 1975 to January, 1976.

	Cows				Heifers				Calves			
	Yes		No		Yes		No		Yes		No	
	n	%	n	%	n	%	n	%	n	%	n	%
Mara Region	7	50	7	50	8	57	6	43	8	57	6	43
Mwanza Region	8	89	1	11	5	56	4	44			9	100
Shinyanga Region	7	88	1	13	6	75	2	25	2	25	6	75
Tabora Region	1	50	1	50	2	100			1	50	1	50
Singida Region	1	100			1	100			1	100		
Dodoma Region	1	20	4	80	3	60	2	40	1	20	4	80
Arusha Region	28	70	12	30	25	63	15	38	4	10	36	90
Total	53	67	26	33	50	63	29	37	17	22	62	78

	Bulls				Steers				Total Respondents
	Yes		No		Yes		No		
	n	%	n	%	n	%	n	%	
Mara Region	9	64	5	36	5	36	9	64	14
Mwanza Region	4	44	5	56			9	100	9
Shinyanga Region	8	100			1	13	7	87	8
Tabora Region			2	100			2	100	2
Singida Region	1	100			1	100			1
Dodoma Region	1	20	4	80			5	100	5
Arusha Region	12	30	28	70	8	20	32	80	40
Total	35	44	44	56	15	19	64	81	79

Table 67. Money Kept in Bank After Selling Cattle in Livestock Zone,
August 1975 to January 1976.

	Yes		No		Don't Sell		Total Respondents
	n	%	n	%	n	%	
Mara Region	7	9	71	90	1	1	79
Mwanza Region	1	1	97	99			98
Shinyanga Region	3	2	118	96	2	2	123
Tabora Region	1	1	93	99			94
Singida Region	2	2	83	98			85
Dodoma Region			73	96	3	4	76
Arusha Region	18	8	195	87	11	5	224
Total	32	4	730	94	17	2	779

Table 68. Keeping someone's cattle in livestock zone,
October, 1975 to January, 1976

	Yes		No		Total
	n	%	n	%	Respondents
Mara Region ^a					
Mwanza Region ^a					
Shinyanga Region ^a					
Tabora Region ^b	17	49	18	51	35
Singida Region	52	61	33	39	85
Dodoma Region	46	59	32	41	78
Arusha Region	61	27	166	73	227
TOTAL	176	41	249	59	425

^a This question was not asked of respondents in this region

^b Only some of the respondents were asked this question in this region

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 69. Number of individuals whose cattle are being kept in respondent's boma in livestock zone, October, 1975 to January, 1976.

	One		Two		Three		Four		Five		More Than 5		Total Respondents
	n	%	n	%	n	%	n	%	n	%	n	%	
Mara Region ^a													
Mwanza Region ^a													
Sinyanga Region ^a													
Tabora Region ^b	11	65	4	24	2	12							17
Singida Region	18	35	15	29	9	17	6	12	3	6	1	2	52
Dodoma Region	28	61	12	26	4	9	2	4					46
Arusha Region	37	61	17	28	3	5	1	2	2	3	1	2	61
Total	94	53	48	27	18	10	9	5	5	3	2	1	176

a) Respondents in this region were not asked this question.

b) Some of the respondents in region were asked this question.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 70. Period of time respondent has been keeping someone's cattle in livestock zone, October, 1975 to January, 1976.

	Less Than 6 Months		6 months to 1 year		1 year to 2 years		More Than 2 years		Total Respondents
	n	%	n	%	n	%	n	%	
Mara Region ^a									
Mwanza Region ^a									
Shinyanga Region ^a									
Tabora Region ^b	2	12	4	24			11	65	17
Singida Region	3	6	7	13	4	8	38	73	52
Dodoma Region	1	2	8	17			37	80	46
Arusha Region	5	8	9	15	18	30	29	48	61
Total	11	6	28	16	22	13	115	65	176

a) Respondents in this region were not asked this question.

b) Some of the respondents in region were asked this question.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 71. Individual whose cattle is being kept by respondent in livestock zone, October, 1975 to January, 1976.

	Father		Brother		Child		Other Relative	
	n	%	n	%	n	%	n	%
Mara Region ^a								
Mwanza Region ^a								
Shinyanga Region ^a								
Tabora Region ^b	1	5	1	5	1	5	8	42
Singida Region	4	6	7	11	3	5	28	43
Dodoma Region	5	10	10	19			24	46
Arusha Region	1	1	21	30	1	1	19	28
TOTAL	11	5	39	19	5	2	79	39

	Friend		Other		Total Respondents	Number of Responses
	n	%	n	%	n	
Mara Region ^a						
Mwanza Region ^a						
Shinyanga Region ^a						
Tabora Region ^b	7	37	1	5	17	19
Singida Region	18	27	5	8	52	65
Dodoma Region	10	19	3	6	46	52
Arusha Region	27	39			61	69
TOTAL	62	30	9	4	176	205

^a Respondents in this region were not asked this question.

^b Some of the respondents in region were asked this question.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 72. Individual whose cattle are being kept by respondent living in the same village in livestock zone, October, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region ^a					
Mwanza Region ^a					
Shinyanga Region ^a					
Tabora Region ^b	9	53	8	47	17
Singida Region	38	75	13	25	51
Dodoma Region	29	63	17	37	46
Arusha Region	38	61	23	39	61
Total	114	65	61	35	175

a) Respondents in this region were not asked this question.

b) Some of the respondents in region were asked this question.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 73. Respondent's reason for keeping someone's cattle in livestock zone, October, 1975 to January, 1976.

	to receive milk		to farm		requested by neighbor or relative		customary practice		breeding and increasing herd for status	
	n	%	n	%	n	%	n	%	n	%
Mara Region ^a										
Mwanza Region ^a										
Shinyanga Region ^a										
Tabora Region ^b	3	18	1	6	8	47			1	6
Singida Region			3	6	18	35	7	13	1	2
Dodoma Region	8	17			13	28	3	7		
Arusha Region	27	44			14	23	2	3	1	2
TOTAL	38	22	4	2	53	30	12	7	3	2
	sharing same boma		shortage of grass in owner's area		to receive milk and manure		Total Respondents			
	n	%	n	%	n	%	n			
Mara Region ^a										
Mwanza Region ^a										
Shinyanga Region ^a										
Tabora Region ^b	3	18	1	6				17		
Singida Region	1	2	3	6	19	37		52		
Dodoma Region	2	4	2	4	18	39		46		
Arusha Region	11	18	6	10				61		
TOTAL	17	10	12	7	37	21		176		

^a Respondents in this region were not asked this question.

^b Some of the respondents in region were asked this question.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 74. Cattle kept in other bomas for herding in livestock zone, October, 1975 to January, 1976.

	Yes		No		Total
	n	%	n	%	Respondents
Mara Region ^a					
Mwanza Region ^a					
Shinyanga Region ^a					
Tabora Region ^b	10	29	24	71	34
Singida Region	31	37	53	63	84
Dodoma Region	16	21	61	79	77
Arusha Region	41	18	186	82	227
TOTAL	98	23	324	77%	422

^a This question was not asked of respondents in this region

^b Only some of the respondents were asked this question in this region.

Table 75. Number of boma in which other cattle are kept in livestock zone, October, 1975 to January, 1976.

	One		Two		Three		Four		Five		Total Respondents
	n	%	n	%	n	%	n	%	n	%	
Mara Region ^a											
Mwanza Region ^a											
Shinyanga Region ^a											
Tabora Region ^b	9	90			1	10					10
Singida Region	11	35	4	13	4	13	4	13	8	26	31
Dodoma Region	13	81	1	6	2	13					16
Arusha Region	30	73	5	12	5	12			1	2	41
TOTAL	63	64	10	10	12	12	4	4	9	9	98

^a Respondents in this region were not asked this question.

^b Some of the respondents in region were asked this question.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 76 Individual who is keeping respondent's cattle in livestock zone, October, 1975 to January, 1976.

	Father		Brother		Child		Other Relative		Friend		Other		Total Respondents	Number of Responses	
	n	%	n	%	n	%	n	%	n	%	n	%			
Mara Region	a														
Mwanza Region	a														
Shinyanga Region	a														
Tabora Region	b		1	9	1	9	6	55	2	18	1	9	10	11	
Singida Region		3	6	8	16	2	4	18	36	15	30	4	8	31	50
Dodoma Region		1	6	3	18	2	12	8	47	3	18			16	17
Arusha Region				12	27	7	16	10	22	16	36			41	45
Total		4	3	24	20	12	10	42	34	36	29	5	4	98	123

a) This question was not asked of respondents in this region.

b) Only some of the respondents were asked this question in this region.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 77. Cattle being kept in other bomas or are in the respondent's village in livestock zone, October, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region ^a					
Mwanza Region ^a					
Shinyanga Region ^a					
Tabora Region ^b	3	30	7	70	10
Singida Region	7	23	23	77	30
Dodoma Region	5	33	10	67	15
Arusha Region	6	15	35	85	41
Total	21	22	75	78	96

a) This question was not asked of respondents in this region.

b) Only some of the respondents were asked this question in this region.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 78. Number of cattle given to others for herding in livestock zone, October, 1975 to January, 1976.

	n	x	s
Mara Region ^a			
Mwanza Region ^a			
Shinyanga Region ^a			
Tabora Region ^b	1	1.00	0.0
Singida Region	18	20.56	23.04
Dodoma Region	16	8.63	9.39
Arusha Region	41	25.54	46.01
Total	76	20.47	36.28

a) This question was not asked of respondents in this region.

b) Only some of the respondents were asked this question in this region.

n = sample size (number in sample)

x = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 79. Cattle being kept by others given as customary gift
in livestock zone, October, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region ^a					
Mwanza Region ^a					
Shinyanga Region ^a					
Tabora Region ^b			10	100	10
Singida Region	4	13	26	87	30
Dodoma Region	2	13	14	88	16
Arusha Region	7	17	34	83	41
Total	13	13	84	87	97

a) This question was not asked of respondents in this region.

b) Only some of the respondents were asked this question in this region.

Table 80. Sold, traded, or paid dowry cattle kept in other bomas in livestock zone during 12 month period ending between October, 1975 and January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region ^a					
Mwanza Region ^a					
Shinyanga Region ^a					
Tabora Region ^b	2	20	8	80	10
Singida Region	3	10	28	90	31
Dodoma Region	1	6	15	94	16
Arusha Region	11	27	30	73	41
TOTAL	17	17	81	83	98

^a This question was not asked of respondents in this region

^b Only some of the respondents were asked this question in this region

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 81. When shifting into village, cattle kept in other bomas for herding in livestock zone, October, 1975 to January, 1976.

	Yes		No		Total Respondents
	n	%	n	%	
Mara Region ^a					
Mwanza Region ^a					
Shinyanga Region ^a					
Tabora Region ^b	1	10	9	90	10
Singida Region	1	3	30	97	31
Dodoma Region			16	100	16
Arusha Region	21	53	19	48	40
TOTAL	23	24	74	76	97

^a This question was not asked of respondents in this region

^b Only some of the respondents were asked this question in this region.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 82. Reason for Keeping Cattle in Other Bomas in Livestock Zone, October 1975 to January 1976.

	Prevent all cattle from dying		Person wants milk		Person wants milk and manure		For Farming		Customary practice		Unable to herd	
	n	%	n	%	n	%	n	%	n	%	n	%
Mara Region ^a												
Mwanza Region ^a												
Shinyanga Region ^a												
Tabora Region ^b							3	30	1	10	2	20
Singida Region	5	16	1	3	4	13	1	3	5	16	1	3
Dodoma Region			1	6	4	25	1	6	1	6	2	13
Arusha Region	3	7	8	20			1	2	2	5	3	7
TOTAL	8	8	10	10	8	8	6	6	9	9	8	8

	Scarcity of grass and water		In case of emergency		Other		Total Respondents
	n	%	n	%	n	%	n
Mara Region ^a							
Mwanza Region ^a							
Shinyanga Region ^a							
Tabora Region ^b			2	20			10
Singida Region			7	23	6	19	31
Dodoma Region			3	19	1	6	16
Arusha Region			21	59			41
TOTAL			33	33	7	7	98

^a This question was not asked of respondents in this region.

^b This question was asked of only a few respondents in this region.

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 83. Herdsmen Selling Cattle by Herd Size in Livestock Zone During 12 Month Period Ending Between August, 1975 to January, 1976.

Herd Size	Yes		No		Total Respondents
	n	%	n	%	
0-5	36	32	78	68	114
6-10	55	40	83	60	138
11-15	59	51	57	49	116
16-20	62	62	38	38	100
21-35	112	69	50	31	162
36-50	49	71	20	29	69
51-100	46	77	14	23	60
100+	30	94	2	6	32

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 84 Percentage of Respondents Selling Steers and Average Age of Steers Sold by Herd Size in Livestock Zone, During Period Ending August, 1975 to January, 1976.

Herd Sizes	% selling Steers %	Age of Youngest Steer			Age of Oldest Steer		
		n	\bar{x}	s	n	\bar{x}	s
0 - 5	5	6	4.50	3.78	6	7.00	4.20
6 - 10	7	10	4.60	2.37	10	5.70	2.36
11 - 15	14	16	4.38	1.25	16	5.88	2.06
16 - 20	23	23	5.17	2.55	23	6.26	2.93
21 - 35	28	45	4.18	2.05	45	5.13	2.25
36 - 50	33	23	3.83	1.50	23	5.00	1.65
51 - 100	53	32	5.06	1.87	32	6.63	1.96
101+	66	21	3.48	1.36	21	6.00	2.17

Source: TAMU/USAID Livestock Survey by Personal Interview.

n = sample size (number in sample)

\bar{x} = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Table. 85 Disposal of Cattle by Herd Size in Livestock Zone, During 12 Month Period Ending August, 1975 to January, 1976.

	Herd Sizes											
	0 - 5			6 - 10			11 - 15			16 - 20		
	n	\bar{x}	s	n	\bar{x}	s	n	\bar{x}	s	n	\bar{x}	s
Cattle Sold	113	1.00	2.10	138	1.36	1.36	114	1.49	2.60	100	2.5	3.39
Cattle Sold ^a	36	3.14	2.68	56	3.36	3.45	58	2.93	3.00	63	3.97	3.53
Cattle Traded	114	.15	.73	138	0.09	0.35	116	0.20	0.55	100	0.26	0.88
Cattle Traded ^a	6	2.83	1.72	9	1.33	.50	16	1.44	.63	13	2.00	1.63
Cattle Dowry	114	.89	4.21	138	0.63	2.72	116	0.50	1.93	100	1.79	6.07
Cattle Dowry ^a	14	7.29	10.91	14	6.21	6.36	12	4.83	4.02	15	11.93	11.45
Total Cattle Died	114	2.46	7.72	138	5.31	33.9	116	3.90	8.68	100	4.87	11.24
Total Cattle Died ^a	52	5.40	10.77	68	10.78	47.85	77	5.87	10.12	75	6.49	12.58
Cattle Died Buried	111	0.42	1.23	135	4.05	34.1	105	1.64	6.19	86	2.24	7.98
Cattle Died Buried ^a	18	2.61	1.91	30	18.23	71.48	33	5.21	10.26	21	9.19	14.28
Cattle Died Eaten	111	2.05	7.77	135	0.33	3.41	105	2.28	7.0	87	2.98	5.65
Cattle Died Eaten ^a	34	6.71	13.00	41	4.39	5.02	44	5.43	10.06	48	5.40	6.71
Cattle Slaughter Eaten	114	0.14	0.58	138	0.37	1.09	116	0.33	0.88	100	0.33	0.83
Cattle Slaughter Sold	114	0.05	0.35	138	0.08	0.77	116	0.05	0.26	100	0.06	0.42
Cattle Stolen or Lost	114	0.02	0.13	138	0.10	0.46	116	0.11	0.53	100	0.31	1.25
Cattle for Gifts	114	0.07	0.37	138	0.07	0.35	116	0.17	1.02	100	0.23	1.46

^aRespondents who actually performed this activity in last 12 months.

n = sample size (number in sample)

\bar{x} = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 85 -Continued

	Herd Sizes											
	21 - 35			36 - 50			51 - 100			100+		
	n	\bar{x}	s	n	\bar{x}	s	n	\bar{x}	s	n	\bar{x}	s
Cattle Sold	162	3.44	4.89	67	5.72	9.80	60	8.65	14.83	31	19.94	21.55
Cattle Sold ^a	115	4.84	5.19	48	7.98	10.79	47	11.04	15.97	29	21.31	21.61
Cattle Traded	163	0.36	1.09	69	0.59	2.14	60	0.77	2.17	32	1.44	5.55
Cattle Traded ^a	23	2.57	1.67	9	4.56	4.33	10	4.60	3.34	4	11.50	12.79
Cattle Dowry	163	1.29	4.32	69	2.71	7.29	60	5.63	14.30	32	5.67	11.76
Cattle Dowry ^a	23	9.17	7.88	15	12.47	11.29	16	21.13	21.34	14	13.00	15.07
Total Cattle Died	163	5.41	12.9	69	10.29	18.36	60	16.15	35.06	32	47.69	58.99
Total Cattle Died ^a	122	7.24	14.46	57	12.46	19.54	54	17.94	36.55	31	49.23	59.31
Cattle Died Buried	142	2.44	12.13	64	2.97	14.9	52	9.65	36.6	27	29.95	51.94
Cattle Died Buried ^a	34	10.18	23.40	13	14.62	31.35	17	29.53	60.39	16	50.38	59.78
Cattle Died Eaten	142	2.81	4.47	64	7.48	12.66	52	6.38	11.50	27	23.15	24.92
Cattle Died Eaten ^a	83	4.81	4.96	45	10.64	13.97	37	8.97	12.78	22	28.41	24.74
Cattle Slaughter Eaten	163	0.72	1.72	69	0.59	1.26	60	2.58	8.66	32	1.53	2.60
Cattle Slaughter Sold	163	0.04	0.25	69	0.12	0.74	60	0.32	1.20	32	0.03	0.18
Cattle Stolen or Lost	163	0.80	4.54	69	0.28	0.78	60	1.48	4.89	32	2.63	9.03
Cattle for Gifts	163	0.42	2.20	69	0.16	0.61	60	0.73	3.94	32	1.50	3.52

^aRespondents who actually performed this activity in last 12 months.

n = sample size (number in sample)

\bar{x} = mean (average) of the sample

s = standard deviation (measure of variability about the mean - includes 2/3 of observations).

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 86 Respondents Dipping Their Cattle by Herd Size in Livestock Zone, August, 1975 to January, 1976

Herd Size	Cattle Dipped Last 7 Days				Cattle Dipped Last 7 to 14 Days				Total
	Yes	%	No	%	Yes	%	No	%	
0 - 5	26	23	88	77	36	32	78	68	114
6 - 10	29	21	109	79	39	28	99	71	138
11 - 15	27	23	89	77	37	32	79	68	116
16 - 20	16	16	83	84	23	23	76	77	100
21 - 35	33	20	130	80	39	24	124	76	163
36 - 50	9	13	60	87	12	17	57	83	69
51 - 100	5	10	54	90	8	13	52	87	60
100+	3	9	29	91	3	9	29	91	32

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table. 87 Respondents Who Vaccinate Their Cattle by Herd Size in the Livestock Zone, August, 1975 to January, 1976.

Herd Size	Yes	%	No	%	Total
0 - 5	53	46	61	54	114
6 - 10	59	43	79	57	138
11 - 15	27	23	89	77	116
16 - 20	47	47	53	53	100
21 - 35	71	44	92	56	163
36 - 50	33	48	36	52	69
51 - 100	24	40	36	60	60
100+	18	56	14	44	32

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 88. Cattle drenched for internal parasites by herd size in livestock zone, during 12 month period ending between August, 1975 to January, 1976.

Herd Size	Yes	Frequency		%	Total
		%	No		
0-5	9	8	105	92	114
6-10	5	4	132	96	137
11-15	4	3	110	96	115
16-20	6	6	94	94	100
21-35	11	7	151	93	162
36-50	1	1	68	99	69
51-100	3	5	57	95	60
100+	1	3	31	97	32

Source: TAMU/USAID Livestock Survey by Personal Interview.

Table 89.-Rank in importance reasons given for keeping cattle by herd size in livestock zone, August, 1975 to January, 1976.

Herd Size Code:	First							Second							Total Respondents			
	0	1	2	3	4	5	6	7	0	1	2	3	4	5		6	7	
0-5	6	67		34	3		1	3	58	16	15	17	2		2	4		
6-10	10	79		44	2		1	2	48	16	22	33	4		3	12		
11-15	18	51		39	7				48	15	8	27	1	1	3	12		
16-20	18	31		47	4				49	19	5	19	2		2	4		
21-35	29	43		82	9				77	34	10	28	5		2	7		
36-50	9	23	2	31	3			1	34	9	6	13	5			2		
51-100	7	24		26	2			1	26	11	4	15	3		1			
100+	4	17		10			1		9	5	1	14	1			2		
Herd Size Code:	Third							Fourth							Total Respondents			
	0	1	2	3	4	5	6	7	0	1	2	3	4	5		6	7	
0-5	90	1	10	3	1		3	6	113							1	0-5	114
6-10	94	10	16	5	4		1	8	126		5	1	2		1	3	6-10	138
11-15	74	7	18	4	2		3	7	110		2		1			2	11-15	115
16-20	63	7	18	4	1		1	6	91		3				1	5	16-20	100
21-35	97	14	25	3	8		4	12	150		1		2		2	8	21-35	163
36-50	48	6	7	3			1	4	63		3					3	36-50	69
51-100	34	2	12	4	4		4		53		3		1			3	51-100	60
100+	19		7	1	2		1	2	31				1				100+	32

Codes:

- 0 No reason identified or multiple reasons given but not ranked
- 1 Kept for milk
- 2 Kept for meat
- 3 Selling in difficulties
- 4 Custom
- 5 Dowry
- 6 Farming
- 7 Other

a) Respondents in this region were not asked to rank their multiple responses.

Table 90. Respondents' sources of cash income by herd size in livestock zone, August, 1975 to January, 1976.

Herd Size	Crops				Livestock				Trade			
	Yes	%	No	%	Yes	%	No	%	Yes	%	No	%
0-5	80	70	34	30	70	61	44	36	6	5	108	95
6-10	77	56	61	44	91	66	47	34	10	7	128	93
11-15	60	52	56	48	92	79	24	21	2	2	114	98
16-20	52	52	48	48	83	83	17	17	7	7	93	93
21-35	86	53	77	47	152	92	11	7	4	2	159	98
36-50	29	42	40	58	63	91	6	8	1	1	68	99
51-100	28	47	32	53	56	93	4	7	2	3	58	97
100+	9	28	23	72	31	97	1	3	1	3	31	97

Herd Size	Wages				Other				Total
	Yes	%	No	%	Yes	%	No	%	
0-5	5	4	108	96	2	2	112	98	114
6-10	10	7	128	93	3	2	135	98	138
11-15	4	3	112	97	1	1	115	99	116
16-20	5	5	95	95	1	1	99	99	100
21-35	6	4	157	96	2	2	161	98	163
36-50	4	6	65	94			69	100	69
51-100	1	2	59	97			59	98	60
100+	1	3	31	97	27	85	5	15	32

CATTLE PRODUCTION

5. Do you feed grains to your calves?
Je, unawapa nafaka ndama? Ndiyo _____ Hapana _____
6. At what age are calves weaned?
Ndama wako wanachoa kuryonya wakiwa na umri wa miezi mingapi? _____ months.
7. Who herds your cattle?
Iftoto wako wa kiume? (Son) _____
Watoto wako wa kiume? (Sons) _____
Iftoto wako wa kike? (daughter) _____
Watoto wako wa kike? (daughters) _____
Ime (husband) _____
Mke (wife) _____
Kibarua (hired labour) _____
Wengine (others) _____
8. a) Yesterday what time did the cattle leave the boma?
Jana ng'ombe wako uliwatoa zizini saa ngapi? _____
b) Yesterday what time did the cattle return to the boma?
Jana walirudi kutoka malishoni saa ngapi? _____
c) Yesterday what time were cattle watered?
Jana ulivanywasha maji saa ngapi? _____
d) Yesterday were calves separated from their mothers?
Je, jana ndama walitengwa kutoka kwa mama zao? Ndiyo _____ Hapana _____
9. Who tells the herder where to graze the cattle?
Nani humweleza mchungaji mahali pa kuchungia malishoni?
Ime _____ Mke _____ Mwenyekiti/Mkubwa wa Kijiji _____
Hakuna mtu _____ Wengine (specify) _____
10. Do you delay certain grazing areas for use only during the dry season?
Je, unasacha sehemu ya machungio kwa ajili ya kiangazi?
Ndiyo _____ Hapana _____
11. Is there a shortage of grass for cattle in this area during the dry season?
Je, kuna uhaba wa majani wakati wa kiangazi? Ndiyo _____ Hapana _____
(If no, then ask)
Could the number of cattle be increased?
Idadi ya wanyama inaweza kuongezeka? Ndiyo _____ Hapana _____
12. Do you move your livestock to another boma for grazing?
Je, huwa unahamisha mifugo yako kutoka hapa kufuata malisho kwenda boma jingine?
a) wakati wa kiangazi? Ndiyo _____ Hapana _____
b) wakati wa masika? Ndiyo _____ Hapana _____
13. Time required to trek cattle from boma to source of grazing during wet season?
Ni muda gani unaozumia kuwaswaga ng'ombe toka zizini kwenda kwenye malisho wakati wa masika?
Chini ya saa 2 _____ Saa 2 mpaka musu siku _____ Musu siku mpaka siku moja _____ zaidi ya siku moja _____ don't know _____

14. Time required to trek cattle from boma to source of grazing during the dry season?
Hi muda gani unaotumia kuwaswaga ng'ombe toka zizini kwenda kwenye malisho wakati wa kiangazi?
Chini ya saa 2 ____ Saa 2 mpaka nusu siku ____ Nusu siku mpaka siku moja ____ Siku mpaka siku 2 ____ Zaidi ya siku 2 ____
15. Do you trek your cattle for salt or other minerals to places other than your regular grazing areas?
Je, huwa unawapoleka ng'ombe kupata chumvi au madini mengine sehemu zingine zaidi ya hapo unapochungia? Ndiyo ____ Hapana ____
(If yes, ask Qt. 16)
16. Time required to trek cattle for salt or other minerals?
Unachukua muda gani kuwaswaga ng'ombe ili wapate chumvi au madini?
Chini ya saa 2 ____ Saa 2 mpaka nusu siku ____ Nusu siku mpaka siku moja ____ Siku mpaka siku 2 ____ Zaidi ya siku 2 ____
Don't know ____
17. Did you water your cattle yesterday?
Uliwapoleka ng'ombe wako kurywa maji jana? Ndiyo ____ Hapana ____
(If yes, ask Qt. 18 and Qt. 19)
18. How many times were cattle watered yesterday?
Ng'ombe wako walikurywa maji marungapi jana?
1 ____, 2 ____, 3 ____, 4 ____, Sijui ____
19. How long did it take to trek cattle to water yesterday?
Hi muda gani uliochukua kuwaswaga ng'ombe kurywa maji jana?
Chini ya saa 2 ____ Saa 2 mpaka nusu siku ____ Nusu siku mpaka siku moja ____ Zaidi ya siku moja ____
20. What is the source of water during the dry season?
Unapataje maji wakati wa Kiangazi?
Kijito au mto ____ Bwawa (Dam) ____ Kiaima (Wells) ____
Borehole ____ Njia nyingine (specify) _____
21. Is there a shortage of water during the dry season?
Kuna uhaba wa maji wakati wa kiangazi?
Ndiyo ____ Hapana ____
22. Do you own all the cattle which you take care of?
Ng'ombe wote ulionao ni wako?
Ndiyo ____ Hapana ____
(If no, then:)
a) Uengine wao? Ndiyo ____ Hapana ____
b) Baadhi yao? Ndiyo ____ Hapana ____
c) Hakuna hata? Ndiyo ____ Hapana ____
(If Hakuna Hata is ticked skip to Qt. 24)

23. How did you acquire your original herd of cattle?

Umewapatajewe wale ng'ombe wako wa kwanza?

- | | <u>Ndiyo</u> | <u>Hapana</u> |
|---|--------------|---------------|
| a) Umewapata kwa mahari? | _____ | _____ |
| b) Umewanunus? | _____ | _____ |
| c) Umewapata kutoka kwa Baba au ndugu, wengine? | _____ | _____ |
| d) Kutokana na malipo ya kazi? | _____ | _____ |
| e) Kwa ajili ya biashara? | _____ | _____ |
| f) Hija nyingine: _____ | | |

24. What did you do with your livestock in the last 12 months? (Includes all cattle managed)

Ulifanya nini na mifugo yako katika muda wa miezi 12 iliyopita?

Types	Waliozwa Wazima	Biashara	Mahari	Waliokufa		Waliochinjwa		Walio-otea	Zawadi
				Kuzikam	Kuliwa	Kuliwa	Kuzwa		
Idadi ya Ng'ombe									
Idadi ya Kondoo									
Idadi ya Iibuzi									
Idadi ya Punda/vikongwe									

25. Do you milk your cows?

Je, huwa unakamua ng'ombe wako maziwa? Ndiyo _____ Hapana _____
(If no, skip Qt. 26 to Qt. 31 and ask 32)

26. How many cows are you milking today?

Ng'ombe wangapi waliokamuliwa maziwa leo? _____

27. How many cows did you milk during the last wet season?

Ng'ombe wangapi waliokamuliwa masika iliyopita _____

28. What time were cows milked yesterday morning?

Ni saangapi ng'ombe walikamuliwa jana asubuhi? _____

29. How many teats did the calves suckle yesterday morning?

Ni chuchu ngapi ndama wako walinyonya jana asubuhi? _____

30. How many teats did the calves suckle yesterday evening?

Ni chuchu ngapi ndama wako walinyonya jana jioni? _____

(If 4 is given in 29 and 30, then ask Qt. 30b.)

30b. How do you decide in dividing the milk between the calf and the home use?

Je, huwa unawagaviya maziwa kati ya ndama na matumizi ya nyumbani?

31. Do you sell any milk?
Je unuza maziwa yo yote? Ndiyo _____ Hapana _____
32. Did you dip or spray your cattle this week?
Je ulivapeleka ng'ombe wako katika josho au kuwanyunyizia dawa juma hili? Ndiyo _____ Hapana _____
33. Did you dip or spray your cattle last week?
Je ulivapeleka ng'ombe wako katika josho au kuwanyunyizia dawa juma lililopita? Ndiyo _____ Hapana _____
(If 32 or 33 is yes then ask 35)
34. When did you last dip or spray your cattle?
Date _____ Kwa nini? _____
35. The last time you dipped your livestock were all of them dipped?
Mara ya mwisho ulipoikogesha mifugo yako ilikogeshwa yote? Ndiyo _____ Hapana _____ (If no ask 36)
36. Which were not dipped?
Ni wapi ambao hawakukogeshwa? Vihongwe (Punda _____ Ndama _____ Kondoo _____ Ibuzi _____ Ng'ombe _____
37. How long does it take to trek cattle to the dipping trough?
Inaluchukua muda gani kuwaswaga ng'ombe mpaka kwenye josho?
Chini ya masaa 2 _____ masaa 2 mpaka ½ siku _____
½ siku mpaka siku moja _____ siku moja mpaka siku 2 _____
zaidi ya siku 2 _____
38. Are you satisfied with the dipping facilities?
Je unaridhika na huduma za josho? Ndiyo _____ Hapana _____
(If no, then ask why?
Kbali sana _____ kupoteza muda kwenye josho _____
Dawa ni hafifu _____ uhaba wa maji _____ gharama yakuogesha _____ sababu zingine taja _____
39. Are your cattle treated for diseases?
Ng'ombe wako hupata matibabu wakiwa wagonjwa? Ndiyo _____
Hapana _____ (If yes ask)

40. What vaccinations have been done on your herd in the last 12 months?
Je, ni dawa gani walizochanjwa ng'ombe wako miezi 12 iliyopita?

Wachanj-waji	Waliokomaa	Hawajakomaa	Kruzi	Kondoo	Vihongwe/Punda
Ugonjwa wa miguu na midomo					
Kimeta					
Chambavu					
Hdigana Baridi					
Hagana					
Sotoka					
Kizungu-zungu					
Other:					

41. How long does it take to trek your cattle to the nearest veterinarian center?

Inakuchukuwa muda gani kuwaswaga ng'ombe wako mpaka kwenye matibabu ya mifugo?

Chini ya $\frac{1}{2}$ siku _____

$\frac{1}{2}$ siku mpaka siku moja _____

Siku moja mpaka siku 2 _____

Zaidi ya siku 2 _____

42. Do you drench for internal parasites in your cattle?
Je, unawaryweshwa ng'ombe wako dawa ya kuzuia wasishambuliwe kwa minyoo?

Ndiyo _____

Hapana _____

43. Do you pay for any of the following cattle costs?
Je unawalipia ng'ombe wako gharama zo zote kati ya hizo zifuatazo?

	Ndiyo	Hapana	Kiasi gani
a) maji			
b) Uchanjwaji			
c) joshu			
d) chumvi/madini			
e) malisho			
f) malisho ya mkulima mwingine			
g) ushuru wa mmada			

44. How many cows do you have in your herd?
Unao ng'ombe majike wangapi wenye umri wa miaka mitatu na zaidi kwenye kundi lako la ng'ombe? Total _____
45. Do you have any cows which are not of the local breed?
Unao ng'ombe majike wote wa kigeni? Ndiyo _____
Hapana _____ Idadi _____
46. How many bulls do you have?
Unao ng'ombe madume wangapi? 1 - 3 years old _____
3 and over _____ Idadi _____
47. Do you have any bulls which are not of the local breed (TSZ)
Unao ng'ombe madume ambao sio wa kienyeji? Ndiyo _____
Hapana _____ (If no, skip to Qtn. 51)
48. How many? Wangapi? _____
49. Are you satisfied with these bulls?
Unaridhika nao? Ndiyo _____ Hapana _____ (If no, ask)
50. Kwa nini?
hawana afya _____ sio mbegu nzuri (dhaifu) _____
wakaidi _____ ridhika na ndama _____ nyingine _____

51. Did you raise all the breeding bulls in your herd?
Je, madume ya kuzalisha wako wote uliwapata kutokana na kundi la ng'ombe wako?
Hdiyo _____ Hapana _____
52. Did you trade heifers for any of the bulls in your herd?
Je, umewahi kubaalicha ng'ombe wako ambao hawajazaa kupata madume?
Hdiyo _____ Hapana _____
53. Did you buy any of the bulls in your herd?
Ulinunua mafahari wowote? Hdiyo _____ Hapana _____
(If yes, then ask)
- 54(a) Where did you acquire the bulls?
Mafahari wako uliwapata kutoka wapi?
Kutoka kwa jirani _____ kutoka sehemu nyingine _____ kutoka NACO _____
kutoka mnadani _____ kutoka Serikalini _____
- 54(b) Have you purposely selected and borrowed a breeding bull for your cows?
Uliazima mafahari wowote? Hdiyo _____ Hapana _____
55. What qualities do you look for when selecting bulls for your herd?
Ni sifa gani unazoweka maanani wakati wa kuchagua madume wa kuzalisha ng'ombe wako?
Ukubwa madume _____ wasio wakali _____ wingi wa maziwa atoayo
ng'ombe jike baada ndama dume kuzaliwa _____ urefu wa mkia wa
dume _____ hali alivyo (rangi) _____ pembe _____ nguvu ya kupanda _____
Other _____
56. Do you castrate any of your bulls?
Je, unawahasi ng'ombe wako madume? Hdiyo _____ Hapana _____
(If yes, ask Qt. 57)
57. At what age do you castrate your bulls? (more than one tick)
Huwa unawahasi wakiwa na umri gani?
Chini miaka miwili _____ miaka miwili _____ miaka mitatu _____
miaka minne _____ miaka mitano _____ zaidi ya miaka mitano _____
sijui _____
58. How many steers do you have?
Unao makasai wangapi? Idadi _____
59. How many heifers do you have?
Unao ng'ombe wangapi ambao kasibu kupandwa?
Idadi _____; tatu au zaidi mitatu _____
60. What was the age of the 1st calf heifer which calved in the last 12 months?
Kati ya ng'ombe waliozaa kwa mara ya kwanza miezi 12 iliyopita moja wao alikuwa na umri gani?
Miaka 2 _____ miaka 3 _____ miaka 4 _____ miaka 5 _____
zaidi ya miaka 5 _____ Ilo heifer calved _____ have no heifers

62. What did you do with your heifers in the last 12 months?
Ulifanya nini na hao ng'ombe ambao bado kuzaa miezi 12 iliyopita?

	<u>Ndiyo</u>	<u>Hapana</u>
Je, uliwaiza baadhi yao?	_____	_____
Je, uliwafanyia biashara baadhi yao?	_____	_____
Je, uliwatoa mahari baadhi yao?	_____	_____
Je, uliwatoa zawadi baadhi yao?	_____	_____
Je, uliwaweka wote?	_____	_____
Aina nyingine _____	_____	_____

63. How many of your cows gave birth to calves in the last 12 months?
Ng'ombe wako wangapi walizaa katika miezi 12 iliyopita?

Idadi _____

64(a) How many of these calves were weaned?

Hii wangapi kati ya hao ndama wameachishwa kunyonya?

Idadi _____

64(b) How many of these calves are still suckling?

Hii ndama wangapi bado wananyonya?

Idadi _____

65. How many calves do you expect a cow to have in her lifetime?

Unategemea ng'ombe mmoja kukuzalia ndama wangapi maishani mwake?

Idadi _____

66. How many calves born in the last 12 months have died?

Hii ndama wangapi waliokufa miezi 12 iliyopita?

Idadi _____

67. Were any of your cattle killed in the last 12 months by wild animals?

Kuna ng'ombe wako ye yote aliyenawa na wanyama wakali miezi 12 iliyopita?

Ndiyo _____ Hapana _____ Sijui _____

Idadi _____

68. Were any of your cattle stolen in the last 12 months?

Kuna ng'ombe wako aliyeibiwa miezi 12 iliyopita?

Ndiyo _____ Hapana _____ Sijui _____ Idadi _____

69. Did any of your cattle starve to death in the last 12 months?
Kuna ng'ombe wako yo yote aliyekufa kwa njaa miezi 12 iliyopita?

Ndiyo _____ Hapana _____ Idadi _____

70. Did any of your cattle die from diseases in the last 12 months?
Kuna ng'ombe wako waliokufa kwa ugonjwa miezi 12 iliyopita?

Ndiyo _____ Hapana _____ Idadi _____

71(a) Did any of your cows have a miscarriage in the last 12 months?
Kuna ng'ombe wako wowote walioharibu mimba miezi 12 iliyopita?

Ndiyo _____ Hapana _____ Idadi _____

71(b) What is the total number of cattle including calves in your herd
now? (managed by respondent)

Je, unao jumla ya ng'ombe wangapi pamoja na ndema katika kundi
lako?

His _____ Neighbour _____ Idadi _____

72. How is your herd different today from one year ago?
Kuna mabadiliko gani kwa wakati huu ukilinganisha na miezi 12
iliyopita katika mifugo yako?

Idadi ile ile _____ imeongezeka _____

imepungua _____

Ask, kwa nini? _____

CATTLE MARKETING

73. Did you sell any of your cattle in the last 12 months?
Umewahi kuza ng'ombe wako miezi 12 iliyopita?
Ndiyo _____ Hapana _____
(If yes, ask Qt. 74. If no, skip to Qt. 89a)
74. Did you take any cattle to the markets for sale in the last 12 months?
Uliwaswaga ng'ombe wowote kuwapeleka mnamani miezi 12 iliyopita?
Ndiyo _____ Hapana _____
(If yes ask Qt. 75a. If no, skip to Qt. 84)
- 75(a) How did you sell these cattle at the market?
Uliwauzaje ng'ombe hao mnamani?
Kwa kuwepiga mmada? _____
Kwa kuza kienyeji? _____
Kwa mizani la TMC (weighbridge) _____
Sikuwauza kabisa? (did not sell) _____
- 75(b) Did you take cattle to the market and then bring any of them back home without selling them in the last 12 months?
Uliwahi kuwapeleka ng'ombe wako mnamani kuwauza na baada yao wakarudi bila kuwauza miezi 12 iliyopita?
Ndiyo _____ Hapana _____
76. Did you sell any cattle during the trek to the market or outside the market?
Je, uliwahi kuwauza ng'ombe njiani wakati ukiwapeleka mnamani miezi 12 iliyopita?
Ndiyo _____ Hapana _____
- 77(a) How often is your primary market open for business?
Je, mmada unayotumia sana hufunguliwa mara ngapi?
Kila juma _____ mara mbili kwa mwezi _____
Kila mwezi _____ nyingine _____
- 77(b) How long does it take to trek cattle from your boma to the market?
Hi muda gani unayotumia kuwaswaga ng'ombe kuwapeleka mnamani?
Chini ya masaa 2 _____ Masaa 2 mpaka $\frac{1}{2}$ siku _____
 $\frac{1}{2}$ siku mpaka siku 1 _____ Siku 1 mpaka siku 2 _____
Siku 2 _____ Zaidi ya siku 2 _____

76. Are there sources of water on the trek from your house/boma to the market during the dry season?
Wakati wa kuwaswaga ng'ombe kwenda mnadani je! Kuna uwezekano wa kupata maji njiani wakati wa kiangazi?
Ndiyo _____ Hapana _____
Kiini: Kijito au mto _____ Kisima (wells) _____
Bwawa (dam) _____ Borehole _____ Other _____
79. How many of your cattle died on the trek to the market in the last 12 months?
Ni ng'ombe wangapi waliokufa wakati wa kuwaswaga kuwapeleka mnadani miezi 12 iliyopita?
Idadi _____
80. How many of your cattle were stolen on the trek to the market in the last 12 months?
Ni ng'ombe wangapi ulioibiwa wakati wa kuwapeleka mnadani miezi 12 iliyopita?
Idadi _____
81. At your primary market place, is there water available in the dry season?
Ikiwa na ng'ombe mnadani je! maji vapo wakati wa kiangazi?
Ndiyo _____ Hapana _____ Kiini: Kijito au Mto _____
Bwawa (dam) _____ Kisima (wells) _____ Borehole _____
Other _____
82. Is there grazing available at the market?
Je, malisho yanapatikana hapo mnadani wakati wa kiangazi?
Ndiyo _____ Hapana _____
83. How often this year did you trek cattle to the market but not sell them?
Ni mara ngapi miezi iliyopita umewaswaga ng'ombe mnadani usiwauze?
Sijawahi _____ Wakati mwingine _____
Mara kwa mara _____ Kwa nini? _____
-
84. Did you sell cattle at your boma/house in the last 12 months?
Je uliwahi kuuzia ng'ombe nyumbani miezi 12 iliyopita?
Ndiyo _____ Hapana _____
(If Qt. 76 or 84 is yes, then ask 85)
85. Why do you sell cattle at other places besides at the market?
Kwa nini huwa unauza ng'ombe sehemu nyingine mbali na mnada?
Kufupisha muda _____ Kupata bei nzuri _____ Kuepuka kodi
ya mnadani _____ Sababu nyingine taja _____
-

86. When you are in need of money and must sell a cow, what do you consider in selecting the cow to sell?

Wakati ukiwa na shida ya pesa, na ikakulazimu kuuza ng'ombe jike ni sifa zipi unazozitia maanani kabla hujamuza:

- a) Ngombe jike atakayekupatia fedha nyingi _____
- b) Ng'ombe jike tasa kwa muda wa miaka 2 _____
- c) Ng'ombe jike tasa kwa muda wa miaka 3 _____
- d) Ng'ombe jike aliyeharibu mimba au aliyezaa ndama amekufa _____
- e) Ng'ombe jike mgonjwa _____
- f) Ng'ombe jike asiyetos maziwa ya kutosha _____
- g) Sijauza _____
- h) Sababu nyingine taja _____

- 86(b) When selling an animal from your herd, what type of cattle do you prefer to sell?

Unapotaka kuuza mnyama toka katika kundi lako, Je, ni ng'ombe wa aina gani ungependelea kuuza?

	Young (less than 3)	Middle age (3 - 8 years)	Old (over 8 yrs)
Calves	_____	_____	_____
Heifers	_____	_____	_____
Immature Steers	_____	_____	_____
Steers	_____	_____	_____
Bulls	_____	_____	_____
Cows	_____	_____	_____

87. What was the age of the youngest steer you sold this year? _____
What was the age of the oldest steer sold this year? _____

Maksai mwenye umri mdogo kuliko wote uliyemuza miezi 12 iliyopita alikuwa na umri gani? _____

Maksai mwenye umri mkubwa? _____

Sikuza maksai ya yote _____ Sina maksai _____

88. If cattle prices were 100/- shillings per head higher at the market than your last sale, would you trek more cattle to the market?

Kama bei ya ng'ombe imakuwa Shs. 100/- zaidi mnadani kuliko mauzo yako yaliyopita, ungepeleka ng'ombe wengine mnadani?

Ndiyo _____ Hapana _____

- 89(a) What is your most important reason for keeping cattle?
Sababu ipi kubwa inayokufanya ufuge ng'ombe?

- a) Kwa ajili ya maziwa kwa jamii yangu _____
- b) Kwa ajili ya kitoweo kwa jamii yangu _____
- c) Limbikizo ya mali (selling in difficulties) _____
- d) Misa _____ (e) Fahari _____ (f) Sababu nyingine _____
- g) Sijui _____

- 89(b) Would you trek (more) cattle to the market, if the market was nearer to your village?
Kama mnada upo karibu na kijiji chako, unaweza kupeleka ng'ombe (zaidi) wengi?
Ndiyo _____ Hapana _____

SHEEP AND GOATS

90. Do you keep sheep and/or goats?
Je unafuga kondoo au mbuzi?
Ndiyo _____ Hapana _____
Idadi ya Kondoo _____ Idadi ya Mbuzi _____
(If no skip to sociological Qt. 108. If yes, ask Qt. 91)
91. Why do you keep them?
Kwa nini unawafuga?
Kwa ajili ya nyama _____
Kwa ajili ya maziwa _____
Kwa ajili ya kuza _____
Na sababu nyingine _____
92. How many ewes (female sheep over 2 years old) do you have?
Unao kondoo majike walubwa wenye umri wa miaka 2 na zaidi wangapi?
Idadi _____
93. How many of your ewes over 2 years old died in the last 12 months?
Ni kondoo majike wangapi wenye umri wa miaka 2 na zaidi waliokufa miezi 12 iliyopita?
Idadi _____
94. How many of your ewes had lambs last year?
Kondoo wazima wangapi waliokuwa na watoto miezi 12 iliyopita?
Idadi _____
95. How many female goats over 2 years old do you have?
Unao mbuzi majike wenye umri wa miaka 2 na zaidi wangapi?
Idadi _____
96. How many of your female goats over 2 years old died in the last 12 months?
Ni mbuzi majike wangapi wenye umri wa miaka 2 na zaidi waliokufa miezi 12 iliyopita?
Idadi _____
97. How many of your goats had kids last 12 months?
Ni mbuzi majike wangapi waliokuwa na watoto miezi 12 iliyopita?
Idadi _____

98. Did you vaccinate your sheep or goats to prevent diseases in the last 12 months?
Je uliwachanja kondoo au mbuzi kuzuia magonjwa miezi 12 iliyopita
Ndiyo _____ Hapana _____
99. Have you dipped your sheep or goats in the last 12 months to control ticks?
Je, uliwakogesha kondoo au mbuzi wako kuzuia makupe miezi 12 iliyopita?
Ndiyo _____ Hapana _____
100. Did you treat your sheep and goats this year to control internal parasites?
Je, kondoo au mbuzi wako walitibiwa ugonjwa wa minyoo miezi 12 iliyopita?
Ndiyo _____ Hapana _____
101. How many sheep had miscarriages in the last 12 months?
Ki kondoo wangapi walioharibu mimba miezi 12 iliyopita?
Idadi _____
102. How many goats had miscarriages within the last 12 months?
Ki mbuzi wangapi walioharibu mimba miezi 12 iliyopita?
Idadi _____
103. Do you sell sheep?
Je, huwa unauza kondoo?
Ndiyo _____ Hapana _____
(If yes, ask Qt. 104)
104. Where do you sell your sheep?
Je, unauza kondoo wapi?

	<u>Ndiyo</u>	<u>Hapana</u>
Mnadani	_____	_____
Kwa wafanya biashara	_____	_____
Marafiki	_____	_____
105. Do you sell goats?
Je, huwa unauza mbuzi?
Ndiyo _____ Hapana _____
(If yes, then ask Qt.106)
106. Where do you sell your goats?
Je, unauza mbuzi wapi?

	<u>Ndiyo</u>	<u>Hapana</u>
Mnadani	_____	_____
Kwa wafanya biashara	_____	_____
Marafiki	_____	_____

107. Do you sometimes trade your sheep and goats for other goods?
Je, huwa unabadilisha mbuzi au kondoo kwa bidhaa nyingine?

Ndiyo _____ Hapana _____

(If yes, ask)

Bidhaa gani?

Chakula _____ Iguo _____ Wanyama _____

Mengineyo (eleza) _____

SOCIOLOGICAL QUESTIONS

108. What are the types of cattle most frequently given in dowry in this area?

Ni ng'ombe wa aina gani wanatolewa mahari katika sehemu hii?

Ng'ombe jike _____ Ndama _____

Ndama jike ambaye karibu kupandwa _____

Maduma (Bulls) _____ Maksi _____

109. What is the number of cattle (ave.) given for bride price in this area?

Ni idadi gani ya ng'ombe inayotolewa mahari katika sehemu hii?

Idadi _____

110. Have you given any cattle to your son as a customary tradition in starting his herd in the last 2 years?

Je, kimila, unewahi kuwapa ng'ombe wanao wa kiume miaka 2 iliyopita?

Ndiyo _____ Hapana _____

(If yes, then ask Qt. 111)

111. What types of cattle were given to your son (major type)?

Kimila, ni ng'ombe wa aina gani uliwapa wanao?

Ng'ombe jike _____ Ndama jike ambao karibu

kupandwa _____ Ndama _____ Maduma (Bull) _____

Maksi _____

- 112(a) If you are owning cattle, will people take other forms of payment of dowry beside cattle?

Kama una ng'ombe wako, je watu wa sehemu hii huwa wanatoza mahari nyingine mbali ya ng'ombe?

Ndiyo _____ Hapana _____

112(b) Halipo gani?

Type	How much?
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____

113. Do you keep any money in the bank when you sell cattle?

Unapouza ng'ombe je unaweka pesa zako benki?

Ndiyo _____ Hapana _____

114. What do farmers and livestock producers do with extra cash?

Wakulima na wafugaji wa sehemu hii hawa wanazitumiaje fedha zao?

Kuweka Benki? _____

Kumunua mifugo? _____

Kumunua vyakula? _____

Kuwakopesha watu? _____

Kumunua pombe? _____

Matumizi mengine? _____

115. Who makes decisions to sell or dispose of your cattle?

Hi nani ana hukumu kuuza ng'ombe wako?

Pake yako? Ndiyo _____ Hapana _____

Ikeo/wake wakohutoa uamuzi? Ndiyo _____ Hapana _____

Wewe pamoja na mkeo na familia wako? Ndiyo _____ Hapana _____

Wewe pamoja na mwenyewe? Ndiyo _____ Hapana _____

Na wenyewe? Ndiyo _____ Hapana _____

MEMBERSHIP QUESTIONS

129. Have you given any of your cattle to someone to herd for you?

Unawapa ng'ombe zako mtu akuchungie?

Ndiyo _____ Hapana _____

(If yes, continue question. If no, skip to Qt. 137)

130. In how many bomas are these cattle kept?

Ng'ombe hawa wanakaa katika mazizi wangapi?

1__, 2__, 3__, 4__, 5__, more than 5__

131. Who is (are) the individual(s)? (more than one tick possible)

Ki nani mtu huyo?

Baba _____, Ndugu _____, Mtoto _____, Jamaa wengine _____,

Bafiki _____, au (eleza) _____

- 132(a) Are all of your cattle that are given to others kept in this village?
Ng'ombe zote zilizopewa watu wengine zinawekwa katika kijiji hiki?
Ndiyo _____ Hapana _____
- 132(b) What is the total number of your cattle given to others?
Ni wangapi umewapa kwa wao?
Idadi _____
133. Were some of these cattle being kept by others given to you as a customary gift?
Ulipewa baadhi ya ng'ombe kama zawadi ya kimila?
Ndiyo _____ Hapana _____
134. Why do you keep cattle in other bomas?
Kwa nini unaweka ng'ombe zako mazizi mengine? _____

135. Did you sell, trade, or pay dowry any of the cattle being kept in other bomas in last 12 months?
Ulifanya biashara au kulipa mahari ng'ombe zako kwa miezi 12 iliyopita?
Ndiyo _____ Hapana _____
136. When shifting to this village did you give some of your cattle to others to herd for you?
Ulipohamia kijiji hiki ulivahi kuwapa watu ng'ombe wakuchungie?
Ndiyo _____ Hapana _____
137. Is respondent keeping someone's cattle?
Yes _____ Ib _____
138. How long have you been keeping someone's cattle in your boma?
Kwa muda gani umeweka ng'ombe za mtu katika zizi lako?
Less than 6 months _____, 6 months to 1 year _____,
1 year to 2 years _____, more than 2 years _____
139. How many individuals are keeping cattle in your boma?
Watu wangapi wanaweka ng'ombe katika zizi lako?
1, 2, 3, 4, 5, more than 5 _____
140. Who is the individual(s) ?
Ni nani?
Baba _____, Ndugu _____, mtoto _____, jamaa wengine _____, rafiki _____,
au (eleza) _____

141. Is this individual living in the village?

Je, huyo mtu anakaa katika kijiji hiki?

Ndiyo _____ Hapana _____

142. Why are you keeping someones cattle?

Kwa nini unstanza ng'ombe za mtu? _____

ENUMERATOR'S OBSERVATIONS

116. Where was the interview conducted? At interviewee's house or home _____,
near interviewee's house or home _____
Other (specify where) _____

117. Was the IO Cell Leader present? Yes _____ No _____
If no, who was (title) _____

118. How many other individuals besides IO Cell Leader, interviewee, and
yourself were present during interview. Number _____

119. Rate the cooperation of the respondent?
Extremely Poor 1 2 3 4 5 6 7 8 9 Extremely Helpful

120. Rate the accuracy of the data?
Very Poor 1 2 3 4 5 6 7 8 9 Very Good

121. Tick condition of grazing in the area:
ASK abundant _____ adequate _____ marginal _____
overgrazed _____ burned _____ Other (specify) _____

122. Tick condition of cattle in the area:
ASK healthy _____ fat _____ lean _____ poor _____
starved _____ disensed _____ other (specify) _____

123. Tick major concern of respondent about Marketing his livestock
ASK low prices _____ not enough buyers _____
Market fees too high _____ not enough markets _____
long distance to market _____ frequency of markets _____
no weighbridge _____ can sell only by weighbridge _____
no grazing at markets _____ no water at markets _____
market is disorderly _____ other _____
He does not sell livestock _____

124. Tick respondent's major concern in the production of livestock in his
ASK area : grazing _____ water _____ dips _____ diseases _____
stealing _____ vaccinations _____ other _____

125. Was respondent upset about questions asking his number of livestock?
Yes _____ No _____
If yes, comment _____

126. Did you count the respondent's livestock? Yes: _____ No _____
If yes, then ask Qt. 127.

127. Did you see any evidence of ticks? Yes _____ No _____
If yes, were they: Light _____ Medium _____ Heavy _____

