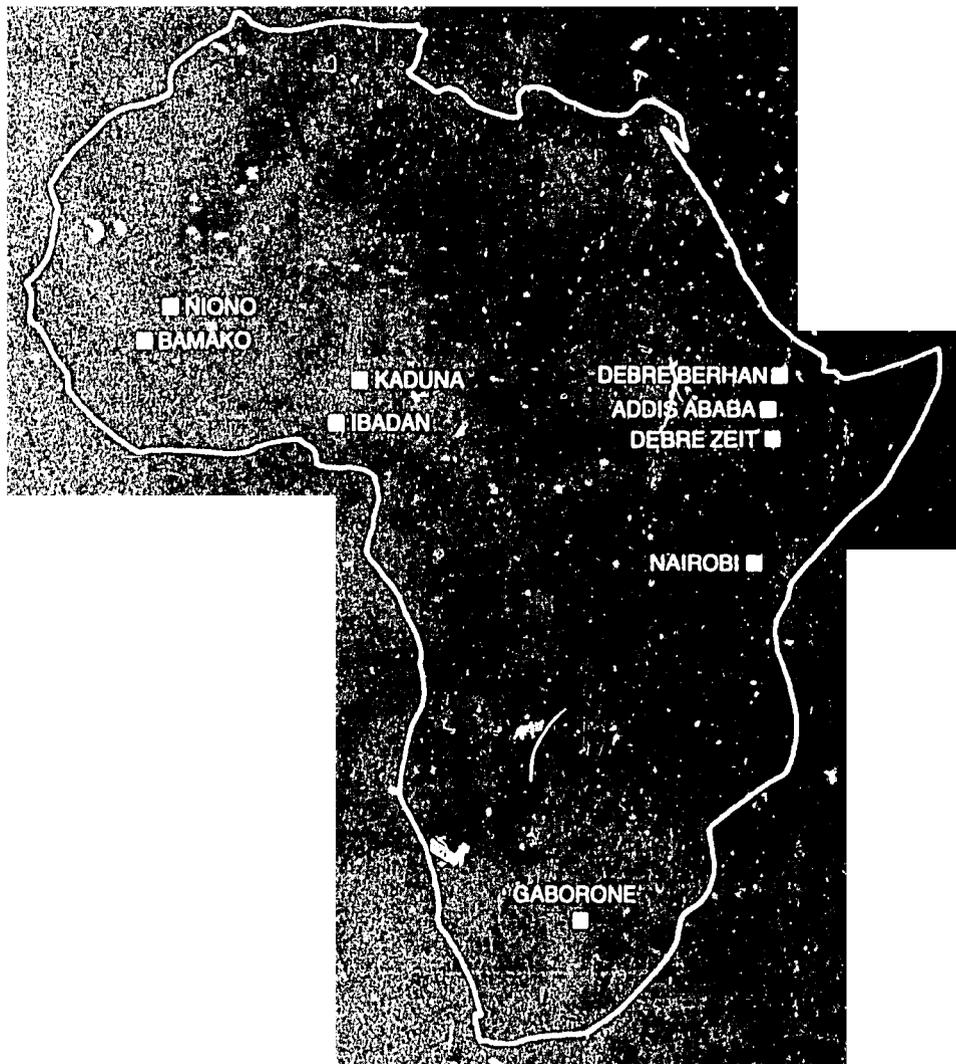


# ILCA

## The Programme of Work and Budget for 1983



ILCA  
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for 1983

International Livestock Centre for Africa  
Addis Ababa  
Ethiopia  
August 30, 1982

ILCA  
PROGRAMME OF WORK AND BUDGET  
1983

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## 1. CENTRE OBJECTIVES

- 1-

ILCA is an international centre of livestock research, training and documentation. Through research, it seeks to increase the production and sale of livestock and livestock products. This research effort is supported by an extensive documentation service and by the provision of training programmes for national research workers. ILCA's goal of increasing livestock production originates in the premise that the output of the arable and pastoral land of Africa is the major determinant of economic growth, and that inadequate increases in livestock and crop output in most African countries in recent years are the key reason for the unsatisfactory rate of economic growth in these countries. The role of livestock in stimulating economic growth derives from their capacity to generate rapid increases in the cash income of subsistence farmers, enabling these farmers to purchase the agricultural inputs needed to generate large increase in food grain production. In the traditional agricultural systems of Africa, there is a strong complementarity between livestock output and crop production, with increase in the former quickly leading to an upturn in the latter. It is this relationship which ILCA specifically seeks to exploit.

Africa has a very large asset in its animal population: its annual output is valued at about US\$ 10 billion, half being attributable to meat and milk, half to non-food products such as manure, traction and transport. Growth in demand has now outstripped the supply capacity of the livestock industry. Meat imports from outside Africa have increased from 24 000 tonnes in 1973 to 76 000 tonnes in 1980. The quantity of imported milk products has more than doubled in the same period, its value quadrupling. On purely economic grounds there are very good reasons for supporting an increase in livestock research in Africa. Other reasons include the need to catalyze national research efforts, enhance land utilization, provide greater taxation revenues from livestock and stabilize pastoral societies.

## 2. THE RESEARCH STRATEGY

In the initial phase of its establishment, ILCA emphasized the description and analysis of the livestock systems prevailing in the different ecological zones of sub-Saharan Africa, but as the recent Quinquennial Review (QQR) observed the emphasis must now shift to research on the key constraints to increased output and productivity. Over the next quinquennium the balance of research at ILCA will focus on the integration of pasture, browse and crop legumes into crop and pastoral systems, the reduction of neonatal mortality, increasing reproductive performance and improving animal traction efficiency.

Scientific expertise to work on these problems is to be expanded at headquarters, and a stronger relationship between field teams and headquarters is expected to result. The initial strengthening of senior scientific staff necessary for this changed strategy must be brought about by modifying existing staffing patterns in the field and at headquarters. The programme and budget for 1983 reflects the initial implementation of this strategy.

### 3. ACHIEVEMENTS

Since its inception in the mid-1970s, the physical development of ILCA may be summarized as follows:

- the construction of a central headquarters complex comprising offices, laboratories, computer, library, hostel and training facilities;
- the establishment of 36 senior and 35 support scientists in 8 research units in 6 countries of Africa, covering all major ecological zones;
- the detailed analysis of the major production systems found in these ecological zones, along with the identification of key bottlenecks limiting livestock production and productivity increases; and
- the publication of 6 major reviews of the various livestock farming systems of Africa, 14 issues of the ILCA Bulletin, and approximately 80 technical papers in scientific journals or in ILCA publications.

Research achievements to date offer great hope for the future. They demonstrate the possibility of major increases in output for both the smallholder and the pastoralist. The most notable of the research results to date are described below:

Research has shown consumption of dry-season pasture is restricted primarily by its low protein level and that supplementation of these pastures has marked effect on animal performance. *Stylosanthes* spp. show great promise as a protein supplement in several areas in the subhumid zone, and short-duration cowpea appear equally promising in the arable areas of the Sahelian zone. The search for new sources of high-protein forage and brose species is now a major priority at ILCA.

By transplanting millet and sorghum directly into land previously sown to *Stylosanthes* spp., ILCA has shown that competition effects from this legume forage are minimized. Additionally the technique enables the food grain area cultivated by each family to be increased, and the value of the stubble grazing greatly enhanced.

Trypanosomiasis restricts animal production over large areas of Africa. The dwarf breeds of cattle, sheep and goats of the West Coast area are relatively tolerant to trypanosomiasis and their comparatively high productivity in infected areas has been highlighted by joint ILCA, ILRAD and FAO studies. The result is a great demand for these breeds. The productivity of trypanotolerant sheep and goats is, however, further constrained by respiratory diseases and external parasites. A simple and cheap animal health package, developed by ILCA in cooperation with the University of Ibadan, coupled with dry-season protein supplementation from browse legumes, has been shown to have a major impact on small ruminant productivity. Experimenting with these and other browse and grazing legumes, and working closely with the International Institute for Tropical Agriculture (IITA) ILCA is developing an integrated crop and livestock production system that seeks to enable the sustained agricultural use of the fragile lateritic soils of West Africa.

New productive species, particularly in the genus *Trifolium*, have been identified in the highlands of eastern Africa. The results of this work have equally important implications for pasture-based livestock systems in several countries outside Africa and ILCA is working closely with the International Bureau of Plant Genetic Resources and the Centro Internacional de Agricultura Tropical to expand greatly the collection of legume germplasm available in Africa.

Crossbreeding studies using improved dairy sires on indigenous cows demonstrate that marked increase in milk production can be sustained under village conditions in both the highland and subhumid zones, and that smallholder milk production using crossbreeds is as applicable in Africa as it has been in India.

Animal traction studies indicate that, with simple modification of traditional yokes and cultivation implements, major gains in the productivity of land cultivation can be attained. Current studies are now exploring optimal feeding and management strategies for work animals and the use of milk cows for work purposes.

The availability and quality of drinking water restricts range utilization in many pastoral areas. This topic forms a major ILCA study to provide sound economic guidelines to national planning authorities on range water supplies, as well as a comprehensive review of all available data on the interrelationship of water and feed metabolism.

Range management studies in the rainfed Sahel show that simple grazing schemes limit degradation and increase dry-matter availability in the dry season. Studies on native browse species have demonstrated optimum cutting techniques that increase the supply of high-quality forage in the dry season, thus supplementing the low-quality standing hay with vitally needed nitrogen during the dry season.

Aerial survey techniques developed to monitor the distribution of nomadic herds and flocks reveal a close concurrence of range livestock distribution and arable farming activities. The alleged confrontation between pastoralists and farmers in the Sahel is not supported by the data collected. Instead, there is a symbiotic complementarity between the two, with pastoralists grazing crop residues and selling soured milk to arable farmers, who in return, sell basic food grains to the pastoralists and use the manure provided by their animals.

As noted by the QQR, ILCA has made a valuable start in getting to grips with livestock production problems in Africa. It is a research organization now well known in tropical Africa - in part because its work in the field is not confined to a research enclave but is at the grass roots level, among the people most likely to benefit directly from it.

THE 1981 BUDGET EXPERIENCE

ILCA's budget submission for 1981 amounted to US\$ 11.224 million net. The CGIAR approved a core budget of US\$ 10.3 million gross and US\$ 10.136 million net. Actual core income in 1981 proved to be US\$ 9.163 million. In consequence the ILCA headquarters buildings complex remains unfinished and research operations reduced.

Incomplete hostels and furnishing, inadequate completion of laboratory and office accommodation, high maintenance costs, inadequate staff housing, substantial remedial works and insufficient farming equipment are the legacy of these cuts which reduce overall productivity and efficiency and increase operating costs.

In spite of cutbacks in capital expenditure and research operations, the shortfall in pledges and the exchange losses of 1981 completely depleted ILCA's working capital. Funds brought forward to 1981 as working capital amounted to US\$ 425 000, all of which was used to meet the budget shortfall. Because of this, and the payment of several 1981 pledges only in mid 1982, ILCA entered 1982 with a bank overdraft of US\$ 840 000. This deficit in working capital resulted in an extremely difficult financial situation in early 1982.

Special project funding in 1981 amounted to US\$ 684 000, some US\$ 453 000 more than in 1980. Major contributions were received for various research and training programmes from the Government of Mali (US\$ 340 000), Kenya (US\$ 100 000), Botswana (US\$ 63 000) and Ethiopia (US\$ 60 000).

ILCA's actual core expenditures in 1981 amounted to US\$ 9.3 million, some US\$ 0.47 million less than the approved budget figure. The core budget situation for 1981 may be summarized as follows:

Approved core budget US\$ 10 300 000

Sources of Funds

Application of Funds

CGIAR	US\$ 9.163	Operations	US\$ 9.013
Earned income	126	Capital	811
Funds brought forward	425	Working capital	(115)
	-----		-----
	US\$ 9.714		US\$ 9.714
	=====		=====

## SUMMARY

Expected funding in 1981 was about 10% below the approved net budget (US\$ 9.163 million as against US\$ 10.136) and 9% (US\$ 815 000) of the expected funding was paid only in mid 1982. Some 50% of the actual shortfall in funding was due to a reduction in pledges and 50% to exchange rate changes. Actual expenditure in 1981 was US\$ 9.83 million, US\$ 470 000 below the approved core budget. The difference between income and expenditure was met by exhausting ILCA's working capital and by bank borrowing. Savings in 1981 were made essentially by cutting existing programmes, as and when contractual obligations allowed, and by deferring new appointments. Over the 3 years during which budget constraints have been experienced, staff benefits have shown a serious decline. Because working capital reserves are now in deficit the flexibility available to manage further budget cuts is severely limited.

THE BUDGET PERSPECTIVE FOR 1982

The proposed ILCA budget for 1982, based on CGIAR guidelines, was US\$ 12.65 million gross and US\$ 12.38 million net, subsequently reduced by TAC to a net budget of US\$ 11.365 million. This amount contained a provision of US\$ 290 000 for implementation of the recommendations of ILCA's Quinquennial Review, should funds be available. The CGIAR approved budget of US\$ 11.075 million net was then again reduced to US\$ 10.067 million net. The core income actually expected in 1982 is now US\$ 9.5 million.

This major reduction in funds available, in addition to the changes required to restructure ILCA's operations in line with the QQR's recommendations, has necessitated a major replanning for 1982.

The modified budget for 1982 is based on:

- (a) an increase in the scientific staffing at headquarters relative to field research;
- (b) an increase in working capital;
- (c) essential remedial work to the headquarters buildings constructed on unstable black clay soils.

To achieve these objectives within the funds available reductions in the areas of administration, field programmes and training have been necessary. The changes being implemented are summarized below.

1982				
	Approved		Revised	
	MY	Amount	MY	Amount
Research				
Direction	1.0	126	1.0	98
Field programmes	25.7	4729	18.0	4066
Central scientific units	4.0	706	8.2	1040
Central support services	8.2	1283	6.8	1035
Total research	38.9	6844	34.0	6239
Information services	2.2	674	2.0	674
Training	1.2	825	1.0	378
Board and management	2.3	566	4.5	764
Administration	5.4	643	4.3	566
Maintenance - Operations	1.0	812	1.0	729
Total core expenditure	51.5	10 364	46.8	9350
Capital		541		525
Working capital increase		300		377
Earned income		11 205		10 252
		(130)		(185)
Net		11 075		10 067

- Field programmes are reduced by US\$ 663 000 and 7.7 man-years. These cuts concern the following posts and their corresponding operating costs.

- (a) In Mali, by the non-recruitment of an agricultural economist (0.6 MY), and non-replacement of an ecologist (1 MY). The QJR recommendation to finalize the report on the socio-economic studies by the end of 1982 makes it necessary to allocate slightly more staff to socio-economic aspects (0.2 MY) and sociology (0.4 MY) in 1982.

- (b) In Kenya, by transfer of the animal scientist to fill the animal physiology post in the HQ animal sciences group (1 MY).
  - (c) In the Ethiopian rangeland programme, by an increased contribution of the Ethiopian Government (1 MY) and delayed recruitment of the animal nutritionist (0.2 MY).
  - (d) In the humid zone programme in Ibadan, by substitution of the forage agronomist by a junior professional (1 MY).
  - (e) In the highlands programme, by transfer of the plant ecologist to the HQ legume group (1 MY), the local animal production specialist to Liaison (1 MY), the farm manager to the headquarters farm (1 MY) and non-renewal of the post of farm manager at the Dabre Zeit station (0.5 MY).
- Administration and general operations are reduced by 1.1 MY and US\$ 160 000 by substitution of the post of internal auditor by a junior professional, transfer of the Liaison office to the office of the Director General and a general cut in operating costs.
  - Training, although recommended by the JQR for increased funding, had to be reduced to the existing commitment which produced a saving of US\$ 447 000.
  - Central support services are reduced by 1.4 MY by deferring the recruitment of a computer manager, and deferring the replacement of the engines for the ILCA aircraft used by the aerial survey group until 1983, to produce a saving of US\$ 243 000.

These cuts, plus minor cost reductions in the office of the Director of Research, in capital expenditure and through an increase in earned income by US\$ 55 000 because of the decision to maintain the aerial survey group, result in total savings of US\$ 1 617 000.

Of these savings, US\$ 1 003 000 is required to meet the TAC recommendation to cut ILCA's net budget in 1982 to US\$ 10 067 000. The remaining US\$ 614 000 is to be used to strengthen central scientific units, and to increase working capital with an additional amount of US\$ 77 000.

- Of the US\$ 334 000 for the central scientific units 0.5 MY and US\$ 67 000 are proposed to be used for the new post of range management specialist. The balance is required to fund staff transfers in animal nutrition, legume agronomy and animal physiology. The role of these senior scientists will change from specific responsibility to a field programme to an overall role in the central scientific units.

- The increase of costs of the Directorate results from the appointment of an Associate Director General (1 MY), in order to enable the new Director General to allocate more time to research. A further increase results from the transfer of a senior Ethiopian professional on the highlands programme to the post of senior liaison officer in the Directorate.

### Summary

Modifications to the 1982 budget have been designed to cope with the substantial reduction in funding available in 1982, as well as to initiate the structural changes recommended by the QQR and TAC. Incremental special funding is being sought to reduce the impact of cuts in the core allocations to training. Major changes now planned for 1982 include a reduction in field programmes, an increase in HQ scientific staff and a restoration of financial liquidity.

A SUMMARY OF THE 1983 BUDGET REQUEST

The 1983 Budget Request

The core budget for 1983 was initially based on the CGIAR guideline of US\$ 13.090 million gross. The figure would have provided ILCA with approximately the same level of funding, in constant dollars, as in 1979. The lower bracket of the revised budget allocation made by TAC in June 1982 presently stands at US\$ 11 258 net (US \$11.388 gross). Details of budgets since 1979 and of the Sources and Application of funds are provided in Annex I, Tables I and II and may be summarized as follows:

	1979	1980	1981	1982	1983	
	Actual	Actual	Actual	Fallback	Lower	Upper
Operation cost	6.812	8.252	9.018	9.350	10.656	10.874
Capital expenditure	2.016	1.482	.811	.525	0.313	0.363
Increase in working capital	-	-	-	.377	0.419	0.692
Gross budget	8.828	9.734	9.829	10.252	11.388	11.929
Earned income	(.154)	(.195)	(.126)	(.185)	(0.130)	(0.130)
Net budget	8.674	9.539	9.703	10.067	11.258	11.799

Core Income

Changes proposed in the 1983 budget and work programme are designed to continue the implementation of the recommendations of the QQR, emphasizing a strengthening of senior scientific staffing and training at ILCA. To achieve these objectives a structural change in staff positions is required, associated with a greater reliance on special funding to support increased training.

The following table summarizes the proposed 1983 core budget, and allows a comparison with the 1982 estimate and the 1981 actual.

	Actual 1981	Estimate 1982	Budget 1983	
			Lower	Upper
Research				
Direction	235	98	98	98
Central scientific units	487	1040	1612	1724
Central support units	810	1035	967	1052
Field programmes	4901	4066	3829	3829
	----	----	----	----
Total research	6433	6239	6506	6703
Information services	897	674	710	710
Training	577	378	518	518
Board and management	690	764	656	656
Administration	745	566	366	366
General Operations	791	729	690	690
	-----	-----	-----	-----
Total core operations	10 133	9350	9446	9643
Price increase	(1 115)		1210	1231
Capital	811	525	313	363
Working capital increase		377	419	692
	-----	-----	-----	-----
Gross core	9829	10 252	11 388	11 929
Earned income	(126)	(185)	(130)	(130)
	-----	-----	-----	-----
Net requirement	9703	10 067	11 258	11 799

The trend started in 1982 of a reduction in the field operation and administration costs, and an increase in the senior scientific staffing at headquarters is continued. The budget proposed also allows a modest increase in training.

The major changes proposed in the field programmes are as follows:

- The arid zones programme in Mali is reduced by US\$ 312 000 and 1.1 man-years, partly because of a transfer of the agropastoral research programme to the ICRISAT Sahelian Centre in Niamey, and partly by a reduction in the socio-economic work programme. The work programme will focus on the initial results obtained in legume agronomy in Mali and Kaduna.
- A reduction of US\$ 205 000 and 0.5 man-year is proposed for ILCA's Kenyan operations. As recommended by the QOR the Kenyan range livestock studies will be reviewed by the

Programme Committee in the second half of 1982. This committee, on the basis of the synthesis presently under preparation, will decide on the future level of input. The budget proposed here includes the non-renewal of the post of socio-anthropologist and a substantial reduction in supplies, services and travel.

In the area of administration and general operations major reductions (US\$ 239 000 and 3.3 man-years) are proposed by the substitution of senior professionals in the area of personnel, audit and general operations by junior professionals. A reorganization of duties whereby senior professionals will maintain overall responsibility in the areas of finance, general operations, administration and physical facilities should maintain adequate overall control.

In the Directorate the discontinuation of the post of one assistant for regional liaison, and the completion of the Quinquennial Review which included a carry-over cost of US\$ 35 000 in the 1982 budget, results in a saving of US\$ 108 000.

the savings of US\$ 534 000 noted above are to be used:

To increase training (US\$ 91 000). The main part of these funds would be used for short courses for African research scientists.

To strengthen the headquarters scientific staff by 2.3 man-years; mainly in the field of legume agronomy. Detailed descriptions of the proposed posts and their justification are provided in Section 6.

The price increase expected in 1983 will absorb the increase expected in 1983 pledges.

Working capital is expected to be at the level of US\$ 262 000 by the end of 1982 if all pledges are paid in full in 1982. Exchange rate losses make this unlikely and modest buildup of working capital in 1983 is essential.

The trend toward more component research at ILCA is associated with a heavier emphasis on the biological sciences, as shown in the following table.

	Man-years of senior staff *		
	1981	1982	1983
Plant and animal sciences	17.7	18.9	18.9
Agricultural economics	5.0	6.0	6.0
Sociology	2.8	2.6	1.5
Support services	10.2	6.5	6.0
	----	----	----
	35.7	34.0	32.4
	=====	=====	=====

\* Excluding professional staff in support services.

THE 1983 CORE PROGRAMME

DIRECTOR OF RESEARCH

Programme Objectives

The Director of Research is responsible for the supervision of the central research units at headquarters and all field research programmes. He has the task of overseeing the sound analysis of existing production systems and of the design and implementation of all research projects.

OFFICE OF DIRECTOR OF RESEARCH

CORE RESOURCES DIRECTOR OF RESEARCH

POSITIONS	MAN-YEARS											
	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Director	1	1	1	1	-	-	-	-	1	1	1	1
Ass. Dir. Planning	1	-	-	-	-	-	-	-	1	-	-	-
<b>Total</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>

	EXPENDITURE			
	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	193	82	82	82
Supplies and services	1	1	1	1
Travel	15	15	15	15
Equipment replacement	-	-	-	-
<b>Total</b>	<b>209</b>	<b>98</b>	<b>98</b>	<b>98</b>
Price increases	-	-	11	21
<b>Grand Total</b>	<b>209</b>	<b>98</b>	<b>109</b>	<b>119</b>

CENTRAL SCIENTIFIC UNITS

## CENTRAL SCIENTIFIC UNITS

The QQR strongly recommended that ILCA strengthen scientific units at headquarters. These units have two functions:

- (a) An advisory role to the field programmes, to ensure the highest possible standards of scientific quality.
- (b) To work at headquarters on problems relevant to more than one production system or ecological zone.

The central scientific units noted below have been selected for their key role in livestock production in sub-Saharan Africa. They are being established by both reallocating existing ILCA staff and by the recruitment of new senior staff using funds from savings effected by staff reductions in field programmes.

### (A) Basic Animal Sciences

#### Animal nutrition

- (a) Crop residues provide a major source of feed to many livestock in Africa and elsewhere. It is now clear that conventional approaches to improving the feed value of the residues by chemical or biological treatment under smallholder conditions in Africa is impractical. Complementing these residues with legume forage is, however, feasible and is likely to have a profound effect on their overall utility. ILCA proposes to investigate the synergism in this supplementation, an area hitherto neglected in nutrition research.
- (b) Fistulated animals will be used on an increased scale to follow preferred grazing consumption and the utilization of the pastoral resource. The specific objective in this work is to find ways to improve dry-season nutrition and productivity.
- (c) Many areas of Africa exhibit mineral deficiencies of various types. ILCA plans to initiate a systematic study of the association of the mineral composition of animal tissues with the fodder available and that actually consumed, soil mineral composition and the overall productivity of livestock.
- (d) Local cows crossbred with exotic bulls have produced female progeny with a greater work and milk production capacity than local Zebu. The possibility of replacing draft males with more productive lactating females opens possibilities for increased calf and milk production as well as an increase in crop areas. The nutritional cost and balance in this possibility must, however, be carefully assessed. This problem will be explored starting in 1983.

### Animal physiology

The work of the animal physiology unit in the central scientific unit is closely related to that of the animal nutrition unit. In 1982 ILCA undertook a major review of the inter-relationship of water consumption, feed intake and animal performance. The development of new water points is a major component of most livestock development projects, but sound data on alternative watering strategies are very scarce. This topic is the focus of much of the work of this unit. A second area of research, which complements the nutrition studies, is the effects of work on the energy balance of different breeds and sexes of cattle.

### Animal health

Peri- and postnatal livestock losses are a major reason for low livestock productivity in Africa. This is an area where concentrated efforts are likely to result in practical solutions in a relatively few years. About a quarter of all calves and 35% of all kids and lambs born die before or shortly after weaning. This tremendous loss is under investigation in each of the major ecological zones. This programme also seeks to train African scientists in epidemiological methods and to undertake the economic assessment of disease control measures, skills very much lacking in sub-Saharan Africa.

### Animal genetics

ILCA is involved in a number of animal breeding studies in cooperation with national organizations. Previous studies have covered the Sahiwal breed. In 1982 a major evaluation of the Boran breed in Kenya is under way. In the Ethiopian highlands ILCA's cooperation with the Institute of Agricultural Research and the Arsi Rural Development Unit is enabling detailed analysis of local dairy crossbreeding results. The animal genetics unit is also closely involved in the trypanotolerance network, detailed in a separate section.

CENTRAL SCIENTIFIC UNITS

CORE RESOURCES

BASIC ANIMAL SCIENCES

MAN-YEARS

POSITIONS	Senior professionals				Scientific/supervisor				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Animal genetics *	1	1	1	1	1	1	1	1	1	1	1	1
Animal nutrition	1	1	1	1	-	-	1	1	1	1	1	1
Animal physiology	-	1	1	1	-	-	1	1	-	-	5	5
Animal health	-	-	0.8	1	-	-	0.5	1	-	-	4	6
<b>Total</b>	<b>2</b>	<b>3</b>	<b>3.8</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>3.5</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>11</b>	<b>13</b>

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	202	287	441	479
Supplies and services	-	59	99	109
Travel	-	22	47	53
Equipment replacement	-	-	-	-
<b>Total</b>	<b>202</b>	<b>368</b>	<b>587</b>	<b>638</b>
Price increases	-	-	64	139
<b>Grand Total</b>	<b>202</b>	<b>368</b>	<b>651</b>	<b>777</b>

\* Partially funded by special funds in 1981.

(B) Legume Agronomy

The analysis of animal productivity data from ILCA's field programmes clearly shows the overriding importance of protein intake on livestock performance in the dry season. Supplementation of dry season grazing with agro-industrial by-products substantially improves productivity, but limited availability and poorly developed delivery systems restrict this approach. On the other hand, the introduction of leguminous plants with high digestibility and protein content is a most promising avenue for development. ILCA has begun research on forage legumes in its programmes in Ethiopia, Mali and Nigeria. In the Ethiopian highlands the search for local legumes has identified ecotypes of *Trifolium* with yields similar to cultivated pastures. In the subhumid zone of northern Nigeria work on *Stylosanthes* is resulting in major advances in the productivity of settled Fulani livestock producers. In the agro-pastoral system of Mali improved cowpea varieties have aroused great interest from smallholders in the ILCA research area. A more concerted effort in the field of legume agronomy is justified, and ILCA proposes to give major emphasis to this subject over the coming years. Of the five posts proposed under this budget heading two are already in existence, namely the plant ecologist for the collection of highlands legumes, and the scientist for germplasm evaluation. A broader based study of the opportunities and constraints in legume introduction is now necessary. Three additional posts are proposed, in pasture evaluation, soil and plant nutrition and microbiology. Discussions are now underway with CIAT to develop a joint legume agronomy programme in order to utilize the extensive experience and germplasm collection of CIAT, and to facilitate the collection and testing programmes of CIAT in Africa.

CENTRAL SCIENTIFIC UNITS

CORE RESOURCES LEGUME AGRONOMY \*

MAN-YEARS

POSITIONS	Senior professionals				Scientific/supervis.				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Plant ecology	1	1	1	1	-	1	1	1	3	3	3	3
Germ plasm screening	-	.7	1	1	-	1	2	2	-	4	4	4
Pasture evaluation	-	-	0.7	1	-	-	0.5	2	-	-	6	10
Microbiology	-	-	-	1	-	-	0.5	2	-	-	2	5
Soil/plant nutrition	-	-	-	1	-	-	-	1	-	-	1	5
Total	1	1.7	2.7	5	-	2	4	8	3	7	16	29

1) At upper level 0.7 MY Senior Professionals added.

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983		Budget 1) 1984
			Lower	Upper	
			Personnel	32	
Supplies and services	5	40	142	142	257
Travel	3	25	45	45	105
Equipment replacement	-	-	-	-	-
Total	90	262	445	557	965
Price increases	-	-	49	61	216
Grand Total	90	262	494	618	1181

\* Legume agronomy also included in field teams.

(C) Animal Traction

Available data indicate that approximately 10 million draught animals are used in sub-Saharan Africa each year. With rising fuel prices, the high capital costs of machinery and the retreat of trypanosomiasis, the importance of draught animals may be expected to increase during the coming years. ILCA believes that the more efficient use of draught animals offers substantial opportunities for helping small farmers to increase food production. Animal traction is already a research component in the Ethiopian highlands and Malian arid zone programmes. The recruitment of an agricultural engineer, with the animal nutritionist, the animal physiologist and the economist of existing teams would ensure the necessary scientific capability to assess input/output relations for different livestock breeds and management strategies. As a second priority the recruitment of a crop agronomist and soil physicist is proposed. The further reduction of the 1983 budget will defer this work largely to 1984.

CENTRAL SCIENTIFIC UNITS

CORE RESOURCES ANIMAL TRACTION \*

MAN-YEARS

POSITIONS	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Agricultural engineer	-	-	-	1	-	-	1	1	-	3	3	3
Crop agronomy	-	-	-	1	-	-	-	1	-	-	5	5
Soil physics	-	-	-	1	-	-	-	1	-	-	2	4
Total	-	-	-	3	-	-	1	3	-	3	10	12

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	-	-	50	306
Supplies and services	-	-	6	130
Travel	-	-	4	30
Equipment replacement	-	-	-	-
Total	-	-	60	466
Price increases	-	-	-	107
Grand Total	-	-	60	573

\* Animal traction also included in field teams.

(D) Livestock Policy

Policy issues are amongst the most important matters affecting livestock development in sub-Saharan Africa, particularly so in the arid pastoral area where few major technical breakthroughs can be expected. In 1982 ILCA recruited a senior professional in the area of range management to guide ILCA's research on the utilization of the rangelands, and at the same time, work with the existing economic team on translating policy issues into practical management proposals.

The additional two professional economists on staff (one international and one locally recruited) are concerned with macro-economic issues of relevance to livestock production in sub-Saharan Africa. The main topics of study under way deal with an evaluation of alternative pricing and taxation policies in the Sahel, their impact on production and consumption of livestock products, producer incomes, distribution of benefits and costs, magnitude of government revenues and volume of foreign exchange earnings.

The policy team is also responsible, in cooperation with other international organizations and national institutions, for assembling and compiling a broad data base of basic statistics for the national livestock sectors.

CENTRAL SCIENTIFIC UNITS

CORE RESOURCES LIVESTOCK POLICY

MAN-YEARS

POSITIONS	Senior professionals				Scientific/supervis.				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Range management	-	0.5	1	1	-	-	1	1	-	1	4	4
Economist	1	1	1	1	-	0.5	1	1	-	-	1	1
Economist	-	1	1	1	-	-	-	-	-	-	-	-
Total	1	2.5	3	3	-	0.5	2	2	-	1	5	5

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	73	165	243	243
Supplies and services	5	5	10	10
Travel	5	5	25	25
Equipment replacement	-	-	-	-
Total	83	176	278	278
Price increases	-	-	29	57
Grand Total	83	176	307	335

(E) Trypanotolerance

Earlier ILCA studies, in cooperation with FAO and UNEP, and carried out in West and central Africa, gave strong indications of the potential of N'Dama cattle to increase livestock production in tsetse-infected areas. This led to the establishment in 1981 of a network of countries interested in research on this topic. ILCA's role in this network is that of coordinator and catalyst, in establishing with national authorities a research network aimed at determining the interaction of breed, tsetse challenge and management systems, as well as the economics of the production of trypanotolerant livestock under different management systems. At present, operations cover Zaire, Gabon, Nigeria, Ivory Coast and Senegal. Together with ILRAD, research is also under way in Kenya and Tanzania on the inheritance of trypanotolerance characteristics. Over the next 2 years it is expected to extend network operations to Benin, Guinea, Sierra Leone, Congo and Gambia.

This programme also has a strong training component. It focuses on the evaluation of health status (with ILRAD), methods to assess tsetse and trypanosomiasis risk (with ICIPE), and on livestock productivity studies and analyses.

The possibility to combine training with practical data analysis greatly appeals to national organizations and is considered highly effective. Opportunities for similar cooperation will be vigorously sought by ILCA over the next years. This programme was highly commended by QQR. It recommended a strong continuing support from ILCA, which is reflected in the budget proposals. The comparatively high amount of supplies and services refers to small inputs (up to US\$ 25 000) per location in Ivory Coast, Benin, Gabon and Nigeria, to enable local personnel to collect the information required. This programme is also actively supported by the Belgian Government at four locations in Zaire. Discussions are under way for special assistance to this programme from the German and French Governments and from the EEC.

CENTRAL SCIENTIFIC UNITS

CORE RESOURCES            TRYPANOTOLERANCE \*

MAN-YEARS

POSITIONS	Senior professionals				Scientific/supervis.				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Trypano-network coordinator *	1	1	1	1	-	0.5	1	1	1	1	1	1
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>0.5</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel *	52	63	71	71
Supplies and services **	1	159	159	159
Travel	-	12	12	12
Equipment replacement	-	-	-	-
<b>Total</b>	<b>53</b>	<b>234</b>	<b>242</b>	<b>242</b>
Price increases	-	-	33	65
<b>Grand Total</b>	<b>53</b>	<b>234</b>	<b>275</b>	<b>307</b>

\* Partially funded by special funds in 1981.

\*\* Includes services for an extensive network system.

SUPPORT SERVICES

## (A) Headquarters Farm and Laboratories

### Programme Objectives and Status

The headquarters farm and animal nutrition laboratory provide nutrition and analytical services to all research programmes and acts also as an analytical reference point for national programmes. A total of about 2000 samples were analysed in 1981, and this is expected to increase to approximately 10 000 samples in 1983. The HQ farm provides land and facilities for germplasm screening as well as a herd of experimental dairy cattle and a flock of experimental sheep.

### Budget Changes

The further development of the land at headquarters requires in 1982 a senior staff input, achieved by internal transfer of the farm management specialist from ILCA's highland programme. It is expected that once the farm development works are completed, this post can be taken over by a junior professional. The increased work load of the laboratory facilities make an increase in support staff and supplies in this unit necessary.

CENTRAL SUPPORT SERVICES

CORE RESOURCES HQ FARM AND LABORATORY

MAN-YEARS

Qualifications	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Farm manager	-	1	-	-	-	-	1	1	3	8	17	17
Analyst	1	1	-	-	2	2	3	3	7	9	12	12
Total	1	2	-	-	2	2	4	4	10	17	29	29

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	87	229	168	168
Supplies and services *	159	159	175	160
Travel	10	10	10	10
Equipment replacement	-	-	-	-
Total	256	398	353	338
Price increases			43	82
Grand Total	256	398	396	420

\* Includes day labour and laboratory services.

(B) BIOMETRICIAN AND COMPUTER UNITS

Programme Objectives and Status

This unit provides statistical and computer programming services to the research, administration and documentation departments of ILCA. It assists also in computer training.

The unit has a Hewlett Packard 3000-III system, supported in the field programmes by a system of micro-computers compatible with the HQ configuration. Demands on the computer group have been increasing rapidly, in part because of increased computing assistance being provided to national organizations. Pressures are increasing rapidly to supplement and upgrade the present system.

Budget Changes

The increase in the computer unit arises from the recruitment of a data analyst. This recruitment is necessary because of the increased work load on computer services. Further enhancement of the basic computer facility is being sought through special funding.

CENTRAL SUPPORT UNITS

CORE RESOURCES COMPUTER UNIT

POSITIONS	MAN-YEARS											
	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Data Analyst	-	-	1*	1	1	0.3	-	-	-	.6	1	1
Scientific programmer	1	1	1	1	1	1	1	1	1	4	4	4
Biometrician	1	1	1	1	-	0.3	1	1	1	1	1	1
<b>Total</b>	<b>2</b>	<b>2</b>	<b>3*</b>	<b>3</b>	<b>2</b>	<b>1.6</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>5.6</b>	<b>6</b>	<b>6</b>

\* at upper budget level.

	EXPENDITURE				
	Actual 1981	Budget 1982		Budget 1983	Budget 1984
		Lower	Upper		
Personnel	166	147	138	223	223
Supplies and services	95	85	85	85	85
Travel	15	20	20	20	20
Equipment replacement	-	-	-	-	-
<b>Total</b>	<b>216</b>	<b>252</b>	<b>243</b>	<b>328</b>	<b>328</b>
Price increases	-	-	28	37	74
<b>Grand Total</b>	<b>216</b>	<b>252</b>	<b>271</b>	<b>365</b>	<b>402</b>

(A) AERIAL SURVEY AND CARTOGRAPHY

Programme Objectives and Status

ILCA's commitment to aerial survey developed from the need to understand the patterns of distribution of livestock in relation to range ecology, and to assess the extent to which ILCA's study areas are typical of the major ecological zones. The techniques developed, and the results produced, have led to an increasing demand from outside agencies for ILCA's assistance in this technique. The survey team has carefully selected these opportunities to help build its own data base. The area surveyed has increased from 22 000 sq km during 1979 to 108 000 sq km in 1980 and to 580 000 sq km during 1981. Training of local staff forms an important aspect of the overall programme; 10 African scientists now have had in-service training on the subject. The cartography unit of this section works mainly on conventional aerial images to prepare land use maps, with the ground truthing required being strongly supported by low-level aerial surveys in Ethiopia and Mali.

Budget Changes

In earlier budget proposals it was suggested that in view of the financial situation the ILCA aircraft should be sold or leased, thus discontinuing ILCA's involvement in this field. Following a recent review of this activity by the new management and on the recommendation of the Board of Trustees, it was decided that ILCA should retain its survey capacity for at least the next two years. Low-level aerial survey is a new technology and the ILCA survey team is the only group in West Africa involved in this field. Discontinuation at this time would signify a considerable setback for its application by national authorities.

Special project funding is being sought to expand ILCA's work in remote sensing and land use planning. It is expected that this would include the present cartographic unit.

CENTRAL SUPPORT SERVICES

CORE RESOURCES            AERIAL SURVEY AND CARTOGRAPHY

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Coordinator	1	1	1	1	1	.8	1	1	-	-	1	1
Pilot	1	1	1	1	-	-	-	-	-	-	-	-
Cartographer *	.*	0.8*	-	-	-	-	-	-	7	7	3	3
<b>Total</b>	<b>2</b>	<b>2.8</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>.8</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>7</b>	<b>4</b>	<b>4</b>

\* Partially funded by special funding.

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	186	295	206	236
Supplies and services	53	75	85	85
Travel	10	15	20	20
Equipment replacement	-	-	60	-
<b>Total</b>	<b>249</b>	<b>385</b>	<b>371</b>	<b>311</b>
Price increases	-	-	52	79
<b>Grand Total</b>	<b>249</b>	<b>385</b>	<b>423</b>	<b>390</b>

## THE FIELD PROGRAMMES

### Introduction

In commenting on ILCA's field programmes the QJR noted they are an essential feature of the continental mandate of ILCA and that they provide a most valuable mechanism for ILCA to operate at the grass roots level of African agricultural and livestock production. They also noted that the successful operation of these field programmes posed particularly difficult management problems and urged that ILCA strengthen this management.

To provide the funds required to increase scientific staffing at HQ some restructuring of the field programmes is necessary. A reduction in these programmes is resisted by the national authorities in the countries concerned and each country has increased the special funding of these operations in 1982 in order to ensure their maintenance. As circumstances allow, ILCA plans to reduce senior staffing in these units and to move them further towards outreach operations.

### Background to the Arid Zone Programme

African livestock are raised in the context of widely differing food production systems. One of the more important of these is range livestock production in which a large number of species are maintained under extensive conditions using the naturally occurring vegetation in the arid and semi-arid zones.

Of the 726 million ha in sub-Saharan Africa suitable for crop and livestock production, 526 million ha (72%) are suitable only for grazing. These pastoral lands are inhabited by close to 40 million people owning about 80 million livestock units, about 57% of the total ruminant livestock population of Africa. Although production systems vary according to location, climate, animal species, social organization and market characteristics, a number of their basic characteristics are common. All are under pressure due to the expansion of cropping at the expense of their dry-season grazing areas and increasing human populations and stocking densities in these pastoral zones have now brought many systems to the point where their viability is at stake.

(A) MALI

Objectives of the Programme

In the pastoral system of central Mali the main objective of ILCA's work is to develop improved range management techniques within the traditional grazing framework. This objective requires a relatively heavy emphasis on socio-economic studies in this zone. In the agro-pastoral systems of the southern zone the objective is to improve the total food production of the millet/livestock farmer of the Sahel directly through improved disease control and animal nutrition, and indirectly through legume introduction and improved animal traction techniques.

Programme Status

Initial results have now been detailed in "Systems Research in the Arid Zones in Mali" (ILCA Research Report No.5, Addis Ababa, in press). This report was presented to the Malian Government for initial comments and published in 1982.

In the agro-pastoral system protein deficiency in dry-season forages and grazing is the main factor limiting livestock output. Research is now focusing on the introduction of forage legumes to improve the nitrogen availability for plants and the protein availability for animals. Promising results have been obtained with forage cowpea (*Vigna* spp.). The effect of improved nutrition using cowpea supplement on the work output of oxen is now being studied.

In the pastoral system, the high calf mortality (35%) found in the traditional systems is the main topic of investigation. An improved grazing management scheme for natural vegetation has been developed which requires the establishment of clearly defined social-territorial units. Methods to establish such pastoral units are now being developed in close association with the Malian Government.

## Programme Strategy

The arid and semi-arid zones programme will finalize baseline studies on the economic and social framework and collate and summarize results by the end of 1982. Component research work on calf nutrition and disease control will be continued. In the agro-pastoral system the germplasm base for annual forage legumes will be expanded both in Mali and in Niger and work on the intercropping system of millet and legumes will be intensified. Current studies on the effect of improved nutrition using legumes on the traction efficiency of work oxen will also be continued. Improved nutrition is particularly important for the timeliness of cultivation under the erratic rainfall conditions of the Sahel. The programme will also assess the potential for interventions affecting both agriculture and livestock husbandry at the upper limits of rainfall (800 - 1000 mm) within the zone. In this rainfall region there is a greater potential for the introduction of forage legumes.

In the pastoral programme, less emphasis will be put on ecological studies and more attention will be given to developing management strategies based on the results so far obtained. By the end of 1982 the joint project with the Malian Government will have resulted in the establishment of a small number of pilot herders associations. They will provide the first opportunity to apply the grazing scheme developed by ILCA. Work on the potential of indigenous browse species will continue as these species provide an important volume of feed at times of the year when little else is available.

In sheep and goats, disease is the major factor limiting output. Detailed diagnoses and epidemiological surveys are to be intensified in conjunction with the Malian Central Veterinary Services Laboratory in Bamako.

## Expected Results

The arid and semi-arid zones programme has accumulated and analyzed a considerable volume of basic data. Emphasis is now moving to component research on identified constraints to provide viable and socially acceptable interventions to improve livestock and agricultural production in the zone.

## Budget Changes

Over the 1982-1984 period the research activities in the agro-pastoral system will be largely transferred to the ICRISAT Sahelian Center in Niamey. A start will be made in 1982 with the transfer of the animal nutritionist, followed in 1983 by the forage agronomist. The present site in Niono will then be used mainly for on-farm trials and work on pastoral systems. The senior scientific staff of the pastoral group will then consist of specialists in ecology/range management, animal production, and one specialist half time in socio-economy. The post of sociologist, partially funded by the Malian Government under a special project agreement which ends in October 1982, will not be continued unless this agreement is renewed. Reduced staffing also allows a reduction in administration, supplies, services and travel costs.

ARID ZONES RESEARCH IN WEST AFRICA

CORE RESOURCES MALI

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Animal production	1	1	1	1	1.2	2	2	2	17	9	9	9
Animal nutrition	1	0.5*	-	-	1	-	1	1	15	9	9	9
Ecology	0.5**	0.5**	1	1	1.5**	1.5**	2	2	10	9	10	10
Agronomy	1	0.5	-	-	1	1	1	1	32	20	10	10
Socio-economy	0.5	0.7	0.5	0.5	1.4**	1.5**	2	2	16	10	5	5
Sociology	**	0.4**	-	-	-	-	-	-	-	-	-	-
Administration	1	-	-	-	1	2	1	1	45	39	10	10
<b>Total</b>	<b>5</b>	<b>3.6</b>	<b>2.5</b>	<b>2.5</b>	<b>7.1</b>	<b>8</b>	<b>9</b>	<b>9</b>	<b>135</b>	<b>96</b>	<b>53</b>	<b>53</b>

\* Transferred to Niger.

\*\* Partially funded by special funding.

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	539	612	401	401
Supplies and services	382	219	140	140
Travel	14	62	40	40
Equipment replacement	5	-	-	-
<b>Total</b>	<b>990</b>	<b>893</b>	<b>581</b>	<b>581</b>
Price increases	-	-	73	145
<b>Grand Total</b>	<b>990</b>	<b>893</b>	<b>654</b>	<b>726</b>

MALI

Special Projects

The Malian Government has funded a project to study existing forms of land use and land tenure, and to develop methods for the identification of pastoral units to allow better grazing management. This project will end in October 1982; its budget of US\$ 170 000 is distributed as follows:

Senior professional staff	MY	US\$'000
Sociologist	0.5	30
Ecologist	0.5	30
Photo interpreter	0.2	10
Local professional staff	-	20
Supplies and services	-	50
Administration	-	30
	----	---
	1.2	170

A second-phase project to intensify research on postnatal losses and to evaluate the development of the pastoral units is being developed in association with the Malian Government.

(B) NIGER

Budget Changes

In mid-1982 the animal nutritionist of the Mali programme will be transferred to the ICRISAT Sahelian Centre in Niamey. In early 1983 it is proposed to transfer the forage agronomist from the arid and semi-arid zones programme in Mali to Niamey and to recruit a research associate for the work on animal traction. Subject to the results of the baseline survey started in Niger in 1982 by the animal nutritionist, the programme will continue the work started in Mali on legume introduction into the millet system, and its effect on improved nutrition for traction and dairy production.

ARID ZONES RESEARCH IN WEST AFRICA

CORE RESOURCES NIGER

MAN-YEARS

Position	Senior professionals				Scientific/supervis.				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Animal nutrition	-	0.5*	1	1	-	0.5	1.5	2	-	2.5	5	8
Forage agronomy	-	-	1*	1	-	-	0.3	2	-	-	5	15
Animal traction	-	-	-	-	-	-	0.3	1	-	-	5	10
<b>Total</b>	-	0.5	2	2	-	0.5	3.1	5	-	2.5	15	33

\* On transfer from Mali to join ILCA/ICRISAT programme.

EXPENDITURE

	Revised 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	-	40	226	311
Supplies and services	-	15	60	110
Travel	-	5	15	15
Equipment replacement	-	-	-	-
<b>Total</b>	-	60	301	436
Price increases	-	-	35	106
<b>Grand Total</b>	-	60	336	542

## (C) EAST AFRICAN RANGE LIVESTOCK SYSTEMS

### INTRODUCTION

During the last 15 years over US\$ 1 billion have been invested by African governments in an attempt to improve range livestock systems in Africa. Governments and aid agencies generally agree that the outcome of this investment has been disappointing. The main reason for this unfortunate result is the inadequate knowledge base on which development interventions were designed. More work is clearly needed to improve knowledge of the dynamics of livestock systems which are the targets of development. Such research must be interdisciplinary in order to capture the often complex interactions of the components of the systems. It is also time-consuming because of the need to establish time series data.

In 1977, ILCA began monitoring three large-scale livestock development projects in Kenya, Ethiopia and Botswana. After 2 years it became evident that apart from physical input/output analyses, understanding the dynamics of pastoral systems would not be possible until more was known of the components of the systems and their interaction. New procedures for studying range livestock systems in Africa, using an interdisciplinary approach, had to be developed. Work on this problem is under way at ILCA operations in Kenya, Ethiopia and Botswana.

## (1) KENYA

### Objectives

Since its start in 1979, the emphasis in the arid zone programme in Kenya has been on the changes occurring in the component units of the pastoral groups distributed across a development gradient in Kajiado District.

### Programme Status and Expected Results

The information collected now covers range dynamics over a four-year period, livestock production over a two-year period and household economic data over a one-year period. The initial analyses show significant differences in overall management strategies between rich and poor households. Further analysis and interpretation of data is expected to lead to the identification of major constraints in the production and marketing of livestock. Neonatal losses both in cattle and small ruminants have been identified as of major importance.

A further outcome of the data analysis and interpretation is expected to be a reliable methodology for rapidly assessing changes in range livestock production and marketing.

First results have led to the establishment of a national monitoring unit by government and the establishment of a selective field data collection system. Further time series data for these analyses are now being collected. ILCA has a collaborative agreement with the Government of Kenya to test the monitoring techniques proposed and to train a group of Kenyan nationals in their use. ILCA's input into the Kenyan range programme is to be reviewed by ILCA's Programme Committee in the second half of 1982.

### Budget Changes

The 1983-1984 budget proposal presented below is preliminary, pending the field review by ILCA's Programme Committee. It is presently proposed to discontinue the post of senior socio-anthropologist in 1983 and reduce operations to work on a small number of key components identified by the systems research of the last years.

EAST AFRICAN RANGE LIVESTOCK SYSTEMS

CORE RESOURCES KENYA

Positions	MAN-YEARS											
	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Agricultural economy	1	1	1	1	-	-	-	-	3	3	3	3
Range management	1	1	1	-	1	1	1	1	3	4	4	4
Sociology	1	0.5	-	-	2	2	2	1	4	5	5	5
Animal science	1*	-	-	-	1	2	1.5	1	4	8	6	5
Administration	1.2	1	1	-	-	-	-	-	8	6	4	3
<b>Total</b>	<b>5.2</b>	<b>3.5</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>4.5</b>	<b>3</b>	<b>22</b>	<b>26</b>	<b>24</b>	<b>20</b>

\*Transferred to central scientific units.

	EXPENDITURE			
	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	579	463	313	199
Supplies and services	102	140	100	90
Travel	48	45	30	20
Equipment replacement	-	-	-	-
<b>Total</b>	<b>729</b>	<b>648</b>	<b>443</b>	<b>309</b>
Price increases	-	-	49	71
<b>Grand Total</b>	<b>729</b>	<b>648</b>	<b>492</b>	<b>380</b>

(2) BOTSWANA

Programme Status and Strategies

ILCA operations in Botswana focus on research into the improved use of the communal grazing lands, an area almost completely neglected by previous research in that country. These communal lands provide grazing for the draught stock and milking cows of small arable farmers in nearby areas and ILCA's research efforts are directed to improving the productivity of these main stock classes. The ILCA computer simulation model has been developed and used in Botswana to study the economic trade-offs between milk and meat under different genetic improvement and management options. The conclusion is that the prospects for dairy development in Botswana are good and government has now asked ILCA for assistance in field trials to test and implement these conclusions.

The earlier work of ILCA on the design and establishment of an appropriate monitoring system for the extensive rangeland development efforts of Government has been taken over by Government and put into field use.

Budget Changes

The present arrangement, whereby the Government of Botswana contributes 80% of all costs incurred in the ILCA Botswana operation, is to continue until mid-1983. Special project funding is being sought to continue further the research work started with APRU.

EAST AFRICAN RANGE LIVESTOCK SYSTEMS

CORE RESOURCES BOTSWANA \*

MAN-YEARS

POSITIONS	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Range management	0.2	0.2	0.4	0.4	-	-	-	-	2	2	2	2
Total	0.2	0.2	0.4	0.4	-	-	-	-	2	2	2	2

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	11	20	40	40
Supplies and services	5	11	11	11
Travel	1	-	-	-
Equipment replacement	-	-	-	-
Total	17	31	51	51
Price increases	-	-	5	10
Grand Total	17	31	56	61

\* Partially funded by special funding.

### (3) ETHIOPIA

#### Programme Relevance and Objectives

The research programme in Ethiopia is based on the premise that production systems studies should be seen as an integral and essential part of any development project, assessing its impact on the target society and developing new or modified interventions through research on specific component constraints.

The study programme will be fully operational in 1982. It centres on the Afar and Borana systems, which are at contrasting ends of the survival spectrum. In the Afar system the use of permanent surface water, although the present cause of serious overgrazing, is likely to be the key element in the conversion of their system from a food deficit into a self-sufficient or surplus system.

The southern rangelands of Ethiopia containing the Borana society represent one of the best preserved pastoral areas in Africa. The critical resource here is the lack of permanent water. The approach adopted by the development project, to increase the length of the wet-season grazing period by constructing rainfed ponds, is relevant to large tracts of underutilized rangeland in all of sub-Saharan Africa.

#### The Status of the Programme

The programme will be fully operational in mid-1982. A research framework has been prepared in collaboration with Government and data collection networks have been established in each study area. These include detailed economic input/output data, demographic and social factors, and animal growth and production parameters on several thousand livestock in each area. Market and meteorological networks have been established, and baseline studies initiated into the status, utilization and organization of the Borana well system, the importance of Afar dry-season retreat areas, and Afar-highland interdependence.

Component research resulting from the systems research started in 1982 centres on studies of the effect of alternative watering strategies on livestock productivity in Borana and on forage production under spate irrigation in the Afar system. These studies will be intensified in 1983.

#### Expected Results

This programme is still in its infancy. The results expected should be applicable to all eastern African pastoral systems.

#### Budget Changes

No major staff changes are foreseen in the core contribution to this programme which is jointly implemented and financed by ILCA and the Ethiopian Rangeland Development Project (RDP). The increase in costs in 1983 is associated with the first full year of the animal nutrition post and a slight increase in supplies and services.

EAST AFRICAN RANGE LIVESTOCK SYSTEMS

CORE RESOURCES ETHIOPIA

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act	End	Bud	End	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Socio-economy*	-	-	-	-	-	-	-	-	1	1	1	1
Ecology/range management	1	1	1	1	1	1	1	1	1	1	1	1
Animal nutrition	-	0.4	1	1	1	1	1	1	1	-	-	-
Total	1	1.4	2	2	2	2	2	2	3	2	2	2

EXPENDITURE \*

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	153	170	214	214
Supplies and services	14	4	9	9
Travel	19	13	15	15
Equipment replacement	-	7	-	-
Total	136	194	238	238
Price increases	-	-	24	48
Grand Total	136	194	262	286

\* Partially funded by special funding.

Special Project

The Ethiopian Rangeland Development Project (RDP) supports this joint programme with the following additional funding.

	RDP Contribution		
	82	83	84
Senior staff	190	213	208
Supplies and services	72	130	142
Administrative staff	54	71	70
	-----		
Subtotal operating costs	316	414	420
Capital	225	29	7
	-----		
Total	541	443	427

## (D) SUBHUMID ZONE

### Objectives of the Programme

The programme aims to develop packages of improved technology for settled Fulani livestock owners, particularly to increase milk production and reduce neonatal mortality in a manner which requires a minimum of inputs from outside the production unit.

### Status

The aerial survey work has already identified the close relationship between cattle and farmed areas. A study of trends in land use conflicts showed that, despite weak pastoral leadership and organization, there is no current trend towards an increased tension between the pastoral and arable farming communities.

The animal production work has continued to focus on broadening the baseline data on herd productivity. Factors such as weaning age, calving interval, age at first calving and fecundity take considerable time to record, and these recording activities must continue for some time yet. Studies have also progressed on the use of local agro-industrial by-products, specifically cottonseed cake, where feeding trials with one kg per day per cow resulted in 85% more milk being extracted and 40% higher weight gain of the calves.

In legume research, undersown Stylosanthes hamata cv Verano reduced grain yields of the primary crop by up to 30% in the initial year of interplanting, the decrease being dependent upon relative sowing dates. Second-year results are likely to be different due to nitrogen accumulation, while the land area cultivated per labour unit is greatly increased in areas previously planted to the legume.

A search for other pasture legumes began with the introduction of legumes from Mali and different parts of Nigeria. Cantrosema pascuorum, C. pubescens and Pueraria phaseoloides have recorded good dry-season survival scores.

In animal health, the veterinary survey showed relatively low adult mortality, but a calf mortality of 16%. Severe incidence of helminthiasis, especially in the wet season, seems to be one of the main causes warranting further studies on strategic drenching.

### Programme Strategies

Improvement in animal nutrition will remain the central focus of the research work. The two main activities involve the strategic feeding of concentrates and the introduction of grazing legumes into pastoral areas; emphasis is now shifting to the latter priority.

The main constraint in crop production in this area centres on the high labour requirements in land preparation. Land tenure conflicts outside of the government-protected grazing reserves are also a recurring problem.

The land tenure issue, as well as the prevailing labour constraints, can be overcome by the integration of arable farming and livestock production. Research on intercropping grains and forage will therefore be intensified, with particular attention to the planting of millet and sorghum into existing stylosanthes swards. This approach, on which experimentation started in 1931, is based on traditional planting techniques of cereals, but in a manner which reduces labour requirements and thereby enables larger areas to be cultivated. This provides an exciting possibility for a major shift in land productivity through the integration of food and forage crops.

Another possibility of overcoming the labour constraint is the preparation of forage areas by cattle trampling. The pastoralists have neither the capital nor the expertise to use machinery, yet without machines the packed soils make poor seedbeds. Early growing natural grasses also make formidable weeds. ILCA plans to intensify current experimentation and on-farm trials in which all land preparation and weed control is done by cattle management, with the objective of using large areas of fallow land for stylosanthes forage production.

To reduce neonatal mortality, a series of parasitic control measures is being tested. Continuing baseline studies on animal production, health, nutrition economics and sociology will be followed. As recommended by the QQR, the economics and social aspects of milk marketing and processing will be the topic of a special study. The aerial survey group will continue to monitor the dynamics of herds and stock movements. Funds permitting, research will also commence on the reasons for sedentarization of the Fulani (a QQR recommendation).

#### Expected results

By the end of 1983 it is expected that the research products of the subhumid zone programme will include:

- (a) A smallholder dairy model: this activity is being strongly supported by federal and state extension services which are now offering feedstuffs for sale to farmers who agree to follow the rationing principles emerging from on-farm trials.
- (b) Strategic deworming of calves: present research should lead to recommendations on deworming methods including drugs, dosage, timing, etc.

- (c) Legumes introduction: advice on undersowing methods, timing and utilization will be available for extension to farmers and pastoralists, together with recommendations on the feasibility of intersod transplanting and minimum tillage techniques for fodder banks.

#### Budget Changes

The 1983 budget proposes the substitution of an expatriate animal nutritionist by a local scientist and the recruitment of a legume agronomist and a socio-economist in the supervisory category.

SUBHUMID ZONE

CORE RESOURCES

Kaduna

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Agricultural economy	1	1	1	1	1	1	1	1	5	5	5	5
Legume agronomy	1	1	1	1	-	-	0.5	1	9	9	9	9
Crop agronomy	-	-	-	-	.4	1	1	1	3	3	3	3
Animal nutrition	1	1	-	-	-	-	1	1	5	5	5	5
Animal health	-	-	-	-	1	1	1	1	3	4	4	4
Socio-economy	0.3	-	-	-	-	-	-	-	-	-	-	-
Field experimentation	1	1	1	1	-	-	-	-	-	-	-	-
Administration	-	-	-	-	1	1	1	1	5	5	5	5
<b>Total</b>	<b>4.3</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>3.4</b>	<b>4</b>	<b>5.5</b>	<b>6</b>	<b>30</b>	<b>31</b>	<b>31</b>	<b>31</b>

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	601	674	624	633
Supplies and services	256	256	250	250
Travel	46	30	20	20
Equipment replacement	5	-	-	-
<b>Total</b>	<b>908</b>	<b>960</b>	<b>894</b>	<b>903</b>
Price increases	-	-	156	315
<b>Grand Total</b>	<b>908</b>	<b>960</b>	<b>1050</b>	<b>1218</b>

## (E) HUMID ZONE

### Objectives

The ILCA humid zone programme aims to increase the productivity of village flocks of small ruminants and to integrate crop and livestock production on the fragile lateritic soils of the humid zones.

### Present Status

The baseline survey, now in its third year, has highlighted paste de pariti ruminants (PPR) and sarcoptic mange as major production constraints, especially in dwarf goats. A preliminary evaluation of veterinary interventions to control these two health problems (a PPR vaccination programme using Tissue Culture Rinderpest Vaccine and monthly dipping to control sarcoptic mange and other ectoparasitic infestations) showed that mortality decreased by 75% and the number of animals weaned increased by 25%.

Nutritional work has highlighted the importance of browse in the diet of small ruminants. Household supplements, although fed extensively, appear to be less important than originally thought. While the health package would appear to be the first step in improving the productivity of village flocks, there is a clear need to develop fodder systems allowing more intensive forms of production. Experience to date indicates that pasture/legume mixtures provide inadequate nutrition in the dry season and considerable emphasis is now being placed on browse species as a dry-season supplement. When alley-cropped, they serve also to sustain soil fertility during the crop phase. The IITA now has 7 years of data on crop productivity of alley cropping systems, and ILCA is working closely with IITA to integrate livestock into the system.

### Programme Strategy

The research programme can be divided as follows: animal health (including screening for specific diseases), forage agronomy (including germplasm assessment, productivity and management of legumes, grasses and browse), nutrition (toxicity and mineral studies, digestibility and intake), animal and pasture management, and socio-economic studies (including farm management studies and economic evaluation of improvements).

The overall strategy is one which begins by examining the existing production systems, identifying constraints and providing solutions through experimental work. The effects of new innovations are then monitored at farm level. The research work involves close collaboration with both IITA and national institutions. Throughout 1982 and 1983 it is planned to continue the detailed animal productivity survey at the village level to understand better the biology of the dwarf breeds.

In animal health, the initial success with the village health package will be followed in 1982/1983 by detailed field trials in cooperation with the University of Ibadan and the Federal Livestock Department. The Federal Livestock Department has also provided special project funding to introduce the health package (see Special projects section).

The forage agronomy work emphasises the screening and assessment of available browse species, particularly the carry-over of wet-season growth into the dry season. The nutritional work is particularly concerned with mineral balance and toxicity problems.

In 1982 a research programme will start on the effect of animals on soil fertility in the alley cropping system, in cooperation with IITA. The Federal Livestock Department is also supporting on-farm trials with alley cropping.

#### Expected Results

Evidence to date suggests that the small ruminant health package will provide the incentive to farmers to increase goat production. Adequate trial data from village flocks in savanna areas will be available by the end of 1983, along with production parameters for dwarf sheep for the same area.

Studies on browse legumes planted in village areas in collaboration with government institutions are being expanded and evaluated. Further research on alternative browse species is likely to successfully identify species which will carry their wet-season growth further into the dry season.

#### Budget Changes

The senior forage agronomist is substituted by a junior professional with a greater degree of backup from headquarters. The increased component research requires an increase in the scientific and supervisory category and a local agricultural economist is budgeted for 1983 to support the economic studies of the team leader.

HUMID ZONE

CORE RESOURCES

Ibadan

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Agricultural economy	1	1	1	1	-	-	1	1	4	4	4	4
Animal production	1	1	1	1	1	0.2	-	-	4	4	4	4
Animal health	1	1	1	1	0.4	-	1	1	2	2	2	2
Animal nutrition	-	-	-	-	1	1	1	1	4	4	4	4
Forage agronomy	1	0.3*	-	-	1	1	1	1	8	9	10	10
Administration	-	-	-	-	1	1	1	1	8	8	8	8
<b>Total</b>	<b>4</b>	<b>3.3</b>	<b>3</b>	<b>3</b>	<b>4.4</b>	<b>3.2</b>	<b>5</b>	<b>5</b>	<b>30</b>	<b>31</b>	<b>32</b>	<b>32</b>

\* Transferred to central scientific units.

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	604	573	601	601
Supplies and services	186	197	191	191
Travel	21	25	20	20
Equipment replacement	81	-	-	-
<b>Total</b>	<b>892</b>	<b>795</b>	<b>812</b>	<b>812</b>
Price increases	-	-	143	287
<b>Grand Total</b>	<b>892</b>	<b>795</b>	<b>955</b>	<b>1099</b>

## (F) HIGHLANDS

### Programme Objectives

The highlands programme is developing and testing an integrated approach for the development of mixed crop and livestock farming systems, and conducting research on production components important to smallholder systems in the African highlands. Livestock are kept by most smallholders in the African highlands to provide milk, meat, manure, draught power, hides and a source of security in times of crop failure. Substantial improvement in the output of all of these production objectives is considered feasible. ILCA has demonstrated that their increased output also leads to increases in food grain production.

### Status of the Programme

Substantial information has now been collected and analysed from the traditional farming system, the potentials and constraints of which have been identified.

A package of innovations introduced to farmers at Debre Zeit has demonstrated that net farm incomes can be increased substantially through the inclusion of crossbred cows and forages in the traditional system. Significantly higher yields and returns per unit area have also been obtained from the cereal crops grown. Overall, the package tested at Debre Zeit has proved a practicable means of achieving significant welfare gains.

The harsher environment at the higher elevations, typified by the Debre Berhan area, poses greater constraints on cereal and pulse production. Early maturing crop varieties are being introduced with the assistance of CIP, CIMMYT and ICARDA. Intensive milk production and potato cropping are further production alternatives being evaluated.

The screening and testing of different forage species has identified promising new varieties. Emphasis is being given to "easy-care", low-input species. Forage research emphasises perennial pastures and long-term leys. ILCA is participating in a multi-location trial in Ethiopia to evaluate promising forages in a broader national context. Ethiopia is also a rich but largely unexplored source of *Trifolium* species. In 1980 ILCA began a collection and assessment study on these legumes. The first production trials in 1981 indicated that some local ecotypes of *Trifolium* sp. produced similar yields to the exotic legumes, but were much more tolerant to waterlogging and low soil fertility status.

Research on improved animal traction has been intensified and expanded at both the ILCA highland research stations and an experiment established to evaluate the short- and long-term effect of traction on cows. Experimental work is also being

undertaken on the use of crossbred oxen with improved implements to cultivate low-lying land presently unused because of seasonal waterlogging. These lands are high in fertility and their use can provide a substantial increase in human food supplies.

#### Programme Strategies

A key feature of the highlands programme is the simultaneous conduct of component research and farming systems research. The systems research has been at three levels: ongoing studies with a sample of farmers in the traditional system, a sample of farmers who have, to different extents, used an improvement package devised by ILCA, and research farms where more innovative enterprise combinations have been tested under ILCA management. The same approach will be followed in 1983. The component research under way centres on forage legumes, animal traction, and the drainage and intensive use of valley bottom land. The work in forage agronomy is being intensified as a result of a special grant from the Swiss Development Corporation. Germplasm collection of indigenous legumes is being intensified. In animal traction a cooperative trial with national research agencies started in 1982 covering different soil types, using different implements and different breeds of oxen in several parts of the country. The work on valley bottom development using crossbred oxen will be intensified. Towards the higher elevations, the drainage problem is compounded by frost risks. Trials on early maturing and frost tolerant varieties are to be intensified. Finally, the research on methane digester already going on in Debre Zeit will also start in Debre Berhan; this is an important matter as wood fuel sources are becoming increasingly scarce through much of the African highlands.

#### Future of the Programme

Research to date has provided detailed knowledge of the target agricultural systems and identified components for study where results will have broad relevance to development. Systems level studies will continue to be an important activity and will progressively have an on-farm testing orientation. The highlands programme is ready to make important contributions to farming systems research (FSR) methodology. A document detailing the ILCA experience will be published in 1983. ILCA's comparative advantage in these studies is its focus on the contribution of both crops and livestock to many smallholder agricultural systems. Thus far most FSR work has seriously neglected the important role of livestock. The primary product of this work will be a FSR model applicable by national agencies in mixed crop/livestock farming zones.

Collaborative agreements are being developed with research agencies in other African highland countries to ensure a rapid dissemination of relevant research methods and results.

### Special Projects

The Swiss Development Corporation has agreed to finance the forage research component for a 3-year period. Their contribution over this period will be US\$ 790 000. Detailed schedules of disbursement are being worked out.

### Budget Changes

The posts in plant exploration and forage agronomy are transferred to the legume agronomy group, a change facilitated by the special project contribution from the Swiss Development Corporation.

HIGHLAND ZONE

CORE RESOURCES

ETHIOPIA

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Agricultural economy	1	1	1	1	2	2	2	2	5	5	5	5
Forage agronomy	-	-	-	-	1	1	1.5	2	12	10	10	10
Animal production	1	-	-	-	1	2	2	2	2	2	2	2
Animal traction	-	-	-	-	-	-	1	1	7	5	5	5
Farm management	2	0.5	-	-	1	1	1	1	13	10	10	10
<b>Total</b>	<b>4</b>	<b>1.5</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>6</b>	<b>7.5</b>	<b>8</b>	<b>39</b>	<b>32</b>	<b>32</b>	<b>32</b>

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	519	360	384	396
Supplies and services	115	105	105	105
Travel	6	20	20	20
Equipment replacement	-	-	-	-
<b>Total</b>	<b>640</b>	<b>485</b>	<b>509</b>	<b>521</b>
Price increases	-	-	55	111
<b>Grand Total</b>	<b>640</b>	<b>485</b>	<b>564</b>	<b>632</b>

## INFORMATION SERVICES

### Programme Objectives and Status

Information services at headquarters are in two main units, Documentation and Publications. ILCA's documentation services seek to collect, process and disseminate information relevant to animal production in Africa, while the Publications Section now handles nearly all the Centre's printing requirements.

### Documentation

Documentation activities have steadily increased over the years, and a number of new services have been made possible by the centre's recently installed computer and printing facilities. There are three main areas of documentation activity at headquarters - the library, the information processing unit and the IDRC microfiche project. Subsidiary documentation centres have been set up in Mali and at Kaduna, Nigeria.

The central library now contains over 46,000 items with well over half this collection devoted to non-conventional literature. As well as running the usual loan, circulation and exchange services, the library sends out microfiche photocopies of selected articles, and tables of contents of periodicals, free of charge to researchers throughout Africa. A question - answer service has been developed and bibliographical searches on specific topics are carried out on request, using the centre's computerized data base. The library also assists the training programme of ILCA by providing visiting trainees full access to its resources, and by running a small training programme of its own for apprentice librarians from other Third World countries.

Closely associated with the library, the information processing unit set up in 1977 is responsible for indexing, abstracting and retrieving literature. The centre's data base now contains references and abstracts of about 16,000 documentary items. Initially, inputs had to be processed twice yearly at FAO headquarters in Rome, but the arrival of ILCA's HP3000/III computer and the installation of MINISIS software in February 1981 marked the beginning of a new era. In 1983 the data base will grow by an estimated 5000 items. The unit developed a Manual of Document Analysis in 1981 and the ILCA Thesaurus is scheduled for completion in early 1983.

The special project funded by the IDRC consists of a two-man team responsible for building the centre's non-conventional collection of documents on microfiche. Since its inception in 1978, the team has visited 14 African countries and photographed about 5000 items in the library collections of national institutes. Countries visited in 1982 include Botswana, Somalia, Upper Volta, Niger and Rwanda, and catalogues listing the documents microfilmed have been published for Sudan, Burundi, Cameroon, Zambia and Tanzania.

In 1983 documentation activities will intensify still further, with increasing emphasis on advertizing the facilities and services available in order to extend their use. The policy of exchange with other libraries will also be more intensively pursued than in the past. The computer will be increasingly used, not only in library administration, but also in the provision of on-line literature searches, and selected bibliographies. The selective dissemination of information (SDI), already initiated with a number of scientists, will be extended to a wider audience including African development planners and policy makers as well as researchers. Establishment of the bibliographic data base will be supplemented by sources such as AGRIS and CAB to widen the retrieval services. The IDRC project, already deemed highly successful, will continue with visits to Togo, Benin, Guinea, and Mauritania while Kenya, Botswana and possibly Zimbabwe will be visited for the second time.

#### Publications

During the establishment phase most of ILCA's major publications were edited in Nairobi and printed either there or in Europe. Over the past 2 years, ILCA publishing and printing activities have been gradually centralized at headquarters. With its range of new equipment, including a Linotype CRTronic typesetter and a Heidelberg GTO single colour offset press, the Publications Section is now wholly independent of the limited commercial printing facilities available in Addis Ababa, although de luxe publications will need to be produced in Europe in the foreseeable future.

Until early 1982 the main scientific and technical publications of ILCA were systems studies, monographs and the ILCA Bulletin, with working documents and newsletters playing a supportive role.

Some changes in publications policy were instituted in 1982 reflecting the recommendations of the QQR and the arrival of a new Director General. ILCA's first Annual Report appeared in April 1982, following the earlier launching of the quarterly ILCA Newsletter. The publication of further monographs and systems studies beyond existing commitments was suspended, and the two series were replaced by a single series of Research Reports. A measure of continuity was provided by the ILCA Bulletin, which continues to reach a wide and appreciative African audience.

1983 will see the further development of these new policies. The Annual Report and the ILCA Newsletter will be continued, and it is expected to increase the number of research reports.

#### Budget changes

No major changes are foreseen in the Information services for 1983. The increased amount allocated to supplies and services refers to the increase in publication output.

INFORMATION SERVICES

CORE RESOURCES

INFORMATION SERVICES

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Head Inform. Services	1	1	1	1	-	1	1	1	4	4	4	4
Library	-	-	-	-	1	1	1	1	7	7	7	7
Information processing	-	0.5	1	1	1	-	-	-	5	5	5	5
Statistics	0.9*	-	-	-	-	-	-	-	-	-	-	-
Editing/translation	1	-	-	-	1	2	2	2	5	6	6	6
Layout	-	-	-	-	1	1	1	1	1	1	1	1
Printing shop	-	-	-	-	-	-	-	-	7	8	8	8
Photo laboratory	-	-	-	-	-	-	-	-	-	1	1	1
Writer	-	0.5	1	1	-	-	-	-	-	-	-	-
<b>Total</b>	<b>2.9</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>29</b>	<b>32</b>	<b>32</b>	<b>32</b>

\* Transferred to livestock policy.

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	588	520	520	520
Supplies and services	196	149	185	185
Travel	14	5	5	5
Equipment replacement	-	-	-	-
<b>Total</b>	<b>798</b>	<b>674</b>	<b>710</b>	<b>710</b>
Price increases	-	-	79	160
<b>Grand Total</b>	<b>798</b>	<b>674</b>	<b>789</b>	<b>870</b>

## TRAINING

### Programme Objectives

The ILCA training programme aims to increase the knowledge and skills of African scientists in research and production techniques relevant to livestock development in sub-Saharan Africa. Following the QQR, emphasis will be on short specific courses in areas of key importance in livestock production. ILCA's priority audience is the research scientist, but attention is also given to the needs of planners, development staff, administrators and managers.

Training programmes are organized through individual training in ILCA's research activities workshops for senior research staff and group training courses for junior scientists and those who wish to refresh their skills in particular techniques.

### Individual Training

From the inception of the programme in 1978 to early 1982, 42 long- and short-term awards have been made to scientists from 9 African countries. Ten African scientists are presently undergoing in-service training. The need to cover a larger audience with the limited funds available has caused ILCA to limit this aspect of training to an estimated cost of US\$ 200 000 p.a. (10 fellowships/year).

### Group Training

#### Conferences and Workshops

Eight conferences and workshops were held during 1980-81 of which the Second Biennial Meeting between ILCA and Leaders in Livestock Research and Development, in January 1981, merits special mention. Six workshops on specific subjects are planned for 1983 at a total cost of US\$ 135 000.

#### Training Courses

Group courses have been largely limited to date by lack of ILCA physical facilities. The new training block was first used in June 1981 for a 3-month bilingual Livestock Systems Research Training Course and was attended by 24 participants from 12 African countries.

With the facilities now available, ILCA plans to expand the group training programme in 1983 to five courses at an estimated total cost of US\$ 250 000.

The following activities are planned for 1983:

#### Workshops

1. Techniques in animal traction research
2. Sheep production
3. Forage research in eastern Africa
4. Smallholder dairy production
5. Livestock production in the humid zone
6. Biennial meeting of leaders in livestock research and development

#### Training Courses

1. The design and analysis of livestock development projects (jointly with EDI) (in French)
2. The use of mini-computers in livestock research
3. Animal nutrition and forage evaluation techniques
4. Laboratory techniques in animal nutrition
5. Economics of animal health and disease control

#### Audiovisuals

A sum of US\$ 40 000 has been included under the heading Supplies and services for the development of audiovisual training materials for general distribution.

#### Budget Changes

The 1983 budget proposes a considerable increase in training, especially through an increase in the number of short courses and research workshops.

TRAINING AND CONFERENCES

CORE RESOURCES

TRAINING AND CONFERENCES

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Conferences and training	1	1	1	1	-	-	1	1	4	3.4	3	3
Total	1	1	1	1	-	-	1	1	4	3.4	3	3

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	145	118	158	158
Supplies and services	356	245	320	655
Travel	13	15	40	40
Equipment replacement	-	-	-	-
Total	514	378	518	853
Price increases	-	-	77	241
Grand Total	514	378	595	1094

BOARD AND MANAGEMENT

Budget Changes

Because of the QQR, and several special meetings to select a new D.G., Board expenses in 1981 were greater than normal. The overlap of D.Gs at the end of 1981 and early 1982 also increased management costs. The assistants to the D.G. resulting from 1981 staff movements are being greatly reduced. The Board of Trustees of ILCA do, however, wish to establish a deputy D.G. post as soon as possible and have included this post in the 1983 budget.

CORE RESOURCES

BOARD

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Secretary	10	10	10	10
Supplies and honorarium	184	101	70	70
Travel	137	68	68	68
Equipment replacement	-	-	-	-
Total	331	179	148	148
Price increases	-	-	25	50
Grand Total	331	179	173	198

MANAGEMENT

CORE RESOURCES

HAN-YEARS

Positions	Senior professionals				Scientific/suparvis.				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Director General	1.4	1	1	1	-	-	-	-	2	4	5	5
Deputy Dir. General	-	-	1	1	-	-	-	-	-	-	-	-
Assistant to DG	1.3	2.5	1	1	-	-	-	-	1	1	1	1
Board Secretary	-	-	-	-	.5	.5	.5	.5	-	-	-	-
Liaison Office	-	1	1	1	-	-	-	-	-	3	3	3
<b>Total</b>	<b>2.7</b>	<b>4.5</b>	<b>4</b>	<b>4</b>	<b>.5</b>	<b>.5</b>	<b>.5</b>	<b>.5</b>	<b>3</b>	<b>8</b>	<b>9</b>	<b>9</b>

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	227	495	428	428
Supplies and services	23	20	20	20
Travel	33	70	60	60
Equipment replacement	-	-	-	-
<b>Total</b>	<b>283</b>	<b>585</b>	<b>508</b>	<b>508</b>
Price increases	-	-	53	107
<b>Grand Total</b>	<b>283</b>	<b>585</b>	<b>561</b>	<b>615</b>

## ADMINISTRATION

### Budget Changes

The administration and finance services at ILCA are currently being reorganized. The major feature of the reorganization is the decentralization of administration for the country programmes and replacement of expatriates by local staff. The function of liaison with local government officers has been moved to the Director General's office.

Projected funding shortages make it necessary to cut administration costs over the next few years by 45% in real terms. System improvements, particularly in the areas of computerization and staffing replacements are being sought.

ADMINISTRATION

CORE RESOURCES

HEADQUARTERS ADMINISTRATION

MAN-YEARS

POSITIONS	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Administration	1	1.0	1.0	1.0	-	-	-	-	1.5	1	1	1
Internal audit	1	.7	-	-	-	-	1.0	1.0	-	-	-	-
Personnel	1	1	-	-	1	1.2	1	1	2.4	2.5	3.0	3.0
Finance	1	1.6	1.0	1.0	2.0	2.1	2.0	2.0	11.5	8.0	7.0	7.0
<b>Total</b>	<b>4</b>	<b>4.3</b>	<b>2</b>	<b>2</b>	<b>3.0</b>	<b>3.3</b>	<b>4</b>	<b>4</b>	<b>15.4</b>	<b>11.5</b>	<b>11.0</b>	<b>11.0</b>

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	479	456	256	256
Supplies and services	153	80	80	80
Travel	31	30	30	30
Equipment replacement	-	-	-	-
<b>Total</b>	<b>663</b>	<b>566</b>	<b>366</b>	<b>366</b>
Price increases	-	-	41	82
<b>Grand Total</b>	<b>663</b>	<b>566</b>	<b>407</b>	<b>448</b>

## HEADQUARTERS OPERATIONS AND MAINTENANCE

There are major changes in the components of headquarters operating expenses in 1983 over 1982, coupled with a slight decrease in total costs. The increases are in building repairs, maintenance and replacements, and the decreases in senior staff and subsidies for the hostel and catering operations.

The headquarters complex, completed in late 1980, has numerous construction defects which must be remedied. There are also a number of modifications and completion works which must be made so that the buildings can be fully utilized.

The vehicle fleet is a major replacement item. Most vehicles are four to seven years old and the difficult road conditions and terrain make it imperative that the fleet be upgraded. A driver has been assigned to each general service vehicle, a qualified mechanic hired and a workshop established.

The major cost reductions arise from staffing changes, reduced deficits in food and catering services and increased hostel utilization.

GENERAL OPERATING EXPENSES

CORE RESOURCES

GENERAL OPERATIONS

MAN-YEARS

Positions	Senior professionals				Scientific/supervis.				Other			
	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud	Act	Bud	Bud	Bud
	81	82	83	84	81	82	83	84	81	82	83	84
Transport	-	-	-	-	-	0.6	1	1	7.0	8.1	9.0	9.0
Office services *	-	-	-	-	-	-	-	-	29.0	25.0	23.0	23.0
Purchase and stores	-	-	-	-	-	1	1	1	6.0	5.0	4.0	4.0
Hostel and catering	1	1	-	-	1	1	1	1	12.0	12.0	12.0	12.0
Security	-	-	-	-	-	-	-	-	17.0	18.5	21.0	21.0
<b>Total</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>2.6</b>	<b>3</b>	<b>3</b>	<b>71.0</b>	<b>68.6</b>	<b>69.0</b>	<b>69.0</b>

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	333	220	214	214
Supplies and services *	194	180	196	196
Travel	5	5	5	5
Equipment replacement	-	85	35	15
<b>Total</b>	<b>532</b>	<b>490</b>	<b>450</b>	<b>430</b>
Price increases	-	-	55	103
<b>Grand Total</b>	<b>532</b>	<b>490</b>	<b>505</b>	<b>533</b>

\* Includes day labour.

GENERAL OPERATING EXPENSES

CORE RESOURCES HEADQUARTERS MAINTENANCE

MAN-YEARS

POSITIONS	Senior professionals				Scientific/supervis.				Other			
	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84	Act 81	Bud 82	Bud 83	Bud 84
Supervisor	-	-	-	-	1	1	1	1	-	.5	1.0	1.0
Equipment technician *	-	-	-	-	-	-	-	-	-	1.0	1.0	1.0
General	-	-	-	-	-	-	-	-	1.0	2.5	2.0	2.0
<b>Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1.0</b>	<b>4.0</b>	<b>4.0</b>	<b>4.0</b>

\* Transferred from Information services.

EXPENDITURE

	Actual 1981	Budget 1982	Budget 1983	Budget 1984
Personnel	45	89	90	90
Supplies and services *	127	150	150	150
Travel	-	-	-	-
Equipment replacement	-	-	-	-
<b>Total</b>	<b>172</b>	<b>239</b>	<b>240</b>	<b>240</b>
Price increases	-	-	31	62
<b>Grand Total</b>	<b>172</b>	<b>239</b>	<b>271</b>	<b>302</b>

\* Includes day labour.

## 8. SPECIAL PROJECTS

ILCA has agreements with a number of governments and international agencies for special project work. As a general policy ILCA uses its core funding for its basic programmes, critical areas of research, training and documentation. In 1982 the total special project funding expected amounts to US\$ 1.825 million. This is considerably greater than the US\$ 684 000 received in 1981.

It is especially gratifying that US\$ 1 221 000 of the total special project contribution comes from African countries. The following table summarises these contributions.

SPECIAL PROJECTS

Programme Operations	Source of funding	1982		1983		1984		
		Senior MY	US\$'000	Senior MY	US\$'000	Senior MY	US\$'000	
Arid zones								
Mali	Populations Council, UK	0.3	34	-	17	-	-	Demography of pastoral populations.
Mali	ODEM, Mali	1.2	170	-	-	-	-	Development of methodology to establish pastoral units in the Sahel.
Mali	ODA, UK	0.2	32	0.4	66	-	-	Human nutrition and health in pastoral societies.
Ethiopia	Rangelands Development Project, Eth.	1	316	1	414	1	420	Research on the impact of livestock development projects (stockpounds, bush control, spate irrigation).
Botswana	Ministry of Agriculture	1	60	-	40	-	40	Livestock research in the communal areas for smallholder dairy devpt.
Subhumid zone	Fed. Livestock Department	-	225	-	-	-	-	Support to on-farm research on smallholder dairy development and establishment of fodder banks.
Humid zone	IDRC, Canada	-	58	-	58	-	35	Development of integrated livestock cropping systems.
	Fed. Livestock Department	-	225	-	-	-	-	Support to ILCA's village work on animal health and alley cropping.
Highlands	S.O.C Switzerland	1	140	2	250	2	275	Forage agronomy.
	Ford Foundation	-	10	-	-	-	-	Results of crossbreeding in the Ethiopian highlands.
Trypano-tolerance	AGCD Belgium	-	53	-	60	-	79	Establishment of four new sites in trypanotolerance networks.
Documentation	IDRC, Canada	-	80	-	39	-	-	Second phase of collection and dissemination of non-conventional literature on livestock production in Africa.
Training	IDRC, Canada	-	30	-	-	-	-	workshop on systems research for pastoral systems.
<hr/>								
Total operations		4.7	1433	3.4	944	3	849	
Capital								
Arid zones								
Ethiopia	RDP	-	-	-	-	-	-	
Trypano-tolerance	Belgium	-	225	-	29	-	7	
		-	168	-	-	-	-	
<hr/>								
Total		4.7	1826	3.4	973	3	856	
		====	=====	====	=====	====	=====	

Additionally a number of outside agencies have seconded young scientists to ILCA's field programmes. As most of those professionals are directly paid by the sponsoring agencies, their value in monetary terms is difficult to assess. Assuming an average cost of US\$ 24 000 per associate scientist seconded results in a total value of US\$ 196 000 in 1982 and US\$ 184 000 in 1983.

Programme	Funding Agency	Subject	Amount (US\$)		
			1982	1983	1984
-----					
Arid zones					
Mali	Netherlands	Animal nutrition	24	24	-
		Human nutrition	24	24	-
	Belgium/FAO	Forage agronomy	24	24	6
	UNVS	Agricultural economy	6	-	-
		Socio-anthropology	6	-	-
		Econometrics	24	24	-
		Human nutrition	24	24	-
Kenya	Ford Foundation	Human nutrition	20	20	-
	Rockefeller Found.	Socio-anthropology	20	20	-
Subhumid zone	GTZ	Animal science	24	24	-
			196	184	6

## 9. CAPITAL REQUIREMENTS

The proposed 1983 Capital Budget amounts to US\$ 321 000. This budget is tailored to the increased scientific staff proposed for the central scientific units and the need for remedial work at headquarters.

### Summary of Capital Requirements \*

	Budget		
	1982	1983	
		Lower	Upper
Category 1 (construction)	276	150	150
Category 2 (equipment)	249	163	213
	<u>525</u>	<u>313</u>	<u>363</u>

\* Details of capital requirements are included in Annex Table VI.

## 10. ASSUMPTIONS ON PRICE CHANGES

The following price changes were assumed in constructing the 1983 and 1984 budget.

### Assumed Annual Price Changes 1983 and 1984 (%)

	Ethiopia	Kenya	Botswana	Mali	Nigeria
	-----	-----	-----	-----	-----
Personnel					
Expatriate	9	9	9	9	9
Local	9	9	9	9	20
Supplies and services	15	15	10	20	20
Travel	20	20	20	20	20
	-----	-----	-----	-----	-----

The average price increase on the total operating budget amounts to approximately 13%. Details of price assumptions are included in Annex Table V.

### 11. Budget Additions

The 1983 ILCA budget range provided by CGIAR is at the lowest level US\$ 11 258 million net and at the highest level US\$ 11 799. Details of the programme changes associated with this uncertainty are outlined in the programme commentary. In summary they are:

	1983 Budget	
	M.Y	Amount
Lower level	42.4	11.258
Upper level	44.1	11.799

Item	M.Y	Amount	Price Increase	Cost	W.C		Total
					Cap.	Adj.	
Data analyst	1.0	85	9	94	-	8	102
Legume group	0.7	112	12	124	50	10	184
Working capital	-	-	-	-	-	255	255
	1.7	197	21	218	50	273	541

## 12. FIVE-YEAR PROJECTION

### Objectives

Based upon the observations of the QQR, TAC and the ILCA Programme Committee, the management of ILCA foresee, over the next five years, a steady extension of the changes initiated in the 1982 revised budget. These changes have two basic goals:

- To strengthen the senior scientific staffing, particularly in central operations.
- To consolidate existing field activities, giving greater emphasis to component research.

Additionally, in the years 1985-1986, if funds allow, it is proposed to establish two new regional programmes in francophone and southeast Africa respectively.

### Requirements

ILCA requires considerable capital expenditures to complete the construction of the headquarters buildings, provide adequate staff housing especially for senior scientific staff, and to create the physical facilities essential to an expansion of component research. Funds for these purposes are urgently required, but because of financial constraints in the CGIAR system they have been introduced into this 5-year projection only in 1985. For the same reason, incremental funds required to implement some QQR recommendations adequately are not introduced until 1984. Should the overall CGIAR funding improve, these items will be introduced earlier.

Working capital needs to be built to approximately 10% of annual operating expenses from its present zero level, the staff benefit package made more attractive to senior scientists, and working and living conditions at field sites greatly improved. As opportunity permits, these requirements will be addressed.

The five-year budget projection resulting from these considerations is as follows:-

FIVE YEAR PROJECTION  
(in '000 000 of 1982 US\$)

	1983		1984	1985	1986	1987
	Lower	Upper				
BASIC OPERATIONAL REQUIREMENTS						
Operation at 1982 level	9.44	9.63	10.25	10.25	10.25	10.25
Estimated net increment to upgrade current operations		-	-	.45	.50	.50
CAPITAL REQUIREMENTS						
Headquarters	0.34	0.40	.80	1.45	1.45	1.35
Field programmes	0.01	0.01	.10	.50	.35	.35
ADDITIONAL ELEMENTS						
Working capital increase	0.42	0.61	.15	.28	-	-
Provision to accelerate QQR implementation		-	.71	1.50	1.50	1.50
New programmes						
Francophone Africa		-	-	1.50	1.00	1.00
Southeast Africa		-	-	.50	1.50	1.50
Gross requirements	10.21	10.71	12.01	16.43	16.55	16.45

ANNEX TABLES  
1983-1984 CORE OPERATIONS BUDGET (1)  
SUMMARY OF MAN-YEARS AND COSTS BY PROGRAMME AND ACTIVITY  
1981-1984 (US\$ '000)

Table I

	ACTUAL 1980		ACTUAL 1981		REVISED 1982		BUDGET 1983(3)		BUDGET 1984	
	MY	COST	MY(2)	COST	MY	COST	MY	COST	MY	COST
RESEARCH										
Director of Research	1.0	193	2.0	209	1.0	98	1.0	98	1.0	98
Central Scientific Units										
Basic animal sciences	-	-	2.0	202	3.0	368	3.3	587	4.0	638
Legume agronomy	-	-	1.0	90	1.7	252	2.7	445	5.0	965
Animal traction	-	-	-	-	-	-	-	60	3.0	466
Livestock policy	0.1	9	1.0	88	2.5	176	3.0	278	3.0	278
Trypanotolerance	3.0	289	1.0	53	1.0	234	1.0	242	1.0	242
Central Support Services										
HQ farm and lab.	2.0	164	1.0	256	2.0	378	-	353	-	338
Computer unit	1.3	350	2.0	216	2.0	252	2.0	243	3.0	328
Aerial survey & cartography	1.5	340	2.0	249	2.8	335	2.0	371	2.0	311
Arid Zones										
Mali	5.0	955	5.0	990	3.6	893	2.5	581	2.5	531
Niger	-	-	-	-	0.5	60	2.0	301	2.0	436
Kenya	5.0	740	5.2	729	3.5	648	3.0	443	1.0	309
Botswana	0.2	35	0.2	17	0.2	31	0.4	51	0.4	51
Ethiopia	1.0	196	1.0	186	1.4	174	2.0	233	2.0	238
Sudhumid Zone	4.8	632	4.3	903	4.0	960	3.0	894	3.0	903
Humid Zone	2.9	709	5.0	392	3.3	775	3.0	812	3.0	812
Highlands	3.6	654	4.0	640	1.5	435	1.0	509	1.0	521
TOTAL RESEARCH	31.4	5316	35.7	5725	34.0	6239	32.4	6506	36.9	7515
INFORMATION SERVICES	3.0	1105	2.9	798	2.0	674	3.0	710	3.0	710
TRAINING AND CONFERENCES	0.5	480	1.0	514	1.0	378	1.0	513	1.0	853
BOARD AND MANAGEMENT	0.0	324	2.7	614	4.5	754	4.0	656	4.0	556
ADMINISTRATION	4.3	574	4.0	663	4.3	556	2.0	366	2.0	366
GENERAL OPERATIONS	-	507	1.0	704	1.0	729	-	690	-	670
TOTAL	41.2	8306	47.3	9013	46.8	9350	42.4	9446	46.9	10770
INFLATION	-	-	-	-	-	-	-	1210	-	2738
TOTAL CORE OPERATIONS		8306		9013		9350		10656		13508
OBJECT OF EXPENDITURE										
Personnel		5734		5869		6235		6146		6852
Supplies/services		2013		2512		2455		2643		3258
Travel		530		445		518		562		645
Equipment replacement		29		91		92		95		15
Inflation		-		-		-		1210		2738
TOTAL CORE OPERATIONS		8306		9013		9350		10656		13508

- 1) Projections for 1985-86 are included as Section II of the programme of work.
- 2) Senior professional man-years have been redefined as per note attached.
- 3) Lower bracket figures; upper figures is 44.1 MY and \$10.874 operation cost.

1983-1984 BUDGET  
SUMMARY OF SOURCES AND APPLICATION OF FUNDS  
(US\$ '000)

Table II

SOURCE OF FUNDS	ACTUAL		1982 BUDGET		PROPOSED BUDGET	
	1980	1981	APPROVED (1)	REVISED	1983(3)	1984
<b>CORE OPERATIONS</b>						
Unrestricted						
African Development Bank	20	17		17		
Australia	416	351		328		
Belgium	558	460		383		
Denmark	237	167		126		
Germany (Federal Republic)	1120	838		806		
India	-	-		50		
Ireland	103	80		150		
Italy	140	295		296		
International Development Association (World Bank)	1700	2175		2610		
Netherlands	200	235		260		
Nigeria	152	155		224		
Norway	380	357		323		
Sweden	428	241		224		
Switzerland	368	371		370		
United Kingdom	277	230		259		
United States of America (USAID)	2250	2400		2500		
Unidentified sources	-	-	11075	376	11258	14423
Income applied in year	195	126	130	185	130	130
<b>SUBTOTAL</b>	<b>8514</b>	<b>8506</b>	<b>11205</b>	<b>9487</b>	<b>11388</b>	<b>14553</b>
Less Allocation to Capital	(950)	(271)	(841)	(902)	( 732)	(1045)
<b>SUBTOTAL</b>	<b>7564</b>	<b>8235</b>	<b>10364</b>	<b>8585</b>	<b>10656</b>	<b>13508</b>
Restricted						
Germany (Federal Republic)	42	-		-		
France	190	133		165		
International Fund for Agricultural Development (IFAD)	456	650		600		
<b>SUBTOTAL</b>	<b>688</b>	<b>783</b>	<b>-</b>	<b>765</b>	<b>-</b>	<b>-</b>
<b>TOTAL CORE OPERATION FUNDS</b>	<b>8252</b>	<b>9018</b>	<b>10364</b>	<b>9350</b>	<b>10656</b>	<b>13508</b>
<b>CAPITAL</b>						
Allocated from core operating funds	950	271	841	902	732	1045
Balance of working funds B/F	957	425	-		262	965
Deficit brought forward			(277)	(115)		
<b>TOTAL CAPITAL FUNDS</b>	<b>1907</b>	<b>696</b>	<b>564</b>	<b>787</b>	<b>994</b>	<b>2010</b>

## SPECIAL PROJECTS

Table II cont'd

Belgium (AGCD)	-	62		221	60	79
Botswana	25	68		60	40	40
Ethiopia	30	60		541	443	427
Forn Foundation	-	-		10	-	-
International Development Research Centre (IDRC)	65	54		168	97	35
Kenya	-	100		-	-	-
Nigeria	-	-		450	-	-
Office de Developement de l'Elevage de la Region de Mopt (CDEM)	111	340		170	-	-
Switzerland (SDC)	-	-		140	250	275
United Kingdom (ODA)	-	-		32	66	-
United Kingdom (Population Council)	-	-		34	17	-
Balance from previous period	38	42	11	34	-	-
Unspecified	-	-	1034	-	-	-
<b>TOTAL SPECIAL PROJECTS</b>	<b>269</b>	<b>726</b>	<b>1045</b>	<b>1860</b>	<b>973</b>	<b>856</b>
<b>TOTAL SOURCE OF FUNDS</b>	<b>10428</b>	<b>10440</b>	<b>11973</b>	<b>11997</b>	<b>12623</b>	<b>16374</b>
<b>APPLICATION OF FUNDS</b>						
CORE OPERATIONS	8252	9018	10364	9350	10656	13508
CAPITAL	1432	811	541	525	313	900
SPECIAL PROJECTS	227	592	1045	1860	973	856
UNEXPENDED BALANCES						
Capital - working Funds C/F	425	(115)	23	262	681	1110
Special Projects	42	34	-	-	-	-
<b>TOTAL APPLICATION OF FUNDS</b>	<b>10428</b>	<b>10440</b>	<b>11973</b>	<b>11997</b>	<b>12623</b>	<b>16374</b>
<b>MEMO</b>						
1. Total core operating funds required	8252	9018	10364	9350	10656	13508
Less earned income applied	(195)	(126)	(130)	(185)	(130)	(130)
Net core operating required	8057	8892	10234	9165	10526	13378
2. Total capital funds required	1907	696	564	787	994	2010
Balance of working funds B/F	(957)	(425)	-	-	(262)	(965)
Deficit brought forward	-	-	277	115	-	-
Net capital funds required	950	271	841	902	732	1045
3. Total funds required from donors	9007	9163	11075	10067	11258	14423
4. Earned income applied to core operations	195	126	130	185	130	130

1) As technically adjusted.

2) Projections for 1985/86 are included in Section II of the programme of work.

3) Lower figure

Note to Tables I and II

The definition of the different staff categories has been changed in this budget presentation. The main change affects the professional categories. In earlier budget submission all national and international professional staff were included in the category "Senior Staff". To bring the information provided in line with the guidelines of the CGIAR Secretariat the senior professional category now only includes those staff members who through experience and responsibility, fully qualify for the senior professional level.

A summary comparison for the 1982 initial budget approved by the CGIAR is provided below:

	Old Classification	Revised Classification
Director of research	1.0	1.0
Central research units		
Livestock policy	2.0	2.5
Basic animal science	-	3.0
Legume agronomy	-	1.7
Trypanotolerance	2.0	1.0
Central support unit		
HQ farm and laboratory	4.0	2.0
Biometrics and computer unit	3.1	2.0
Aerial survey and cartography	2.8	2.8
Field research		
Mali	9.3	3.6
Niger	-	0.5
Kenya	6.5	3.5
Botswana	0.2	0.2
Ethiopia	3.6	1.4
Subhumid zone	7.0	4.0
Humid zone	6.5	3.3
Highlands	7.9	1.5
	-----	-----
Total research	55.9	34.0
	=====	=====
Information services	5.2	2.0
Training	1.2	1.0
	-----	-----
Total information and training	6.4	3.0
	-----	-----
Board and management	2.8	4.5
HQ administration	6.4	4.3
	-----	-----
Total administration	9.2	8.8
	-----	-----
HQ operations	2.0	1.0
	-----	-----
Total operations	73.5	46.8
	=====	=====

INTERNATIONAL LIVESTOCK CENTRE FOR AFRICA

SUMMARY FINANCIAL DATA 1980-1984

(US\$ '000)

Table III

	ACTUAL 1980	ACTUAL 1981	ORIGINAL 1982	REVISED 1982	BUDGET 1983	BUDGET 1984
<b>CURRENT ASSETS</b>						
Cash	275	544	275	400	1065	1135
Receivable from - donors	865	1175	600	600	700	800
- employees	103	117	90	112	100	75
- others	539	389	300	150	150	150
Inventories	251	234	250	200	250	350
Prepaid expenses	154	223	200	200	200	200
<b>TOTAL CURRENT ASSETS</b>	<b>2187</b>	<b>2682</b>	<b>1715</b>	<b>1662</b>	<b>2465</b>	<b>2710</b>
<b>FIXED ASSETS</b>						
Buildings	6133	6401				
Research and lab. equipment	466	761				
Computer	71	332				
Furnishings and office equipment	1481	1425				
Vehicles and aircraft	1072	1235				
Others	316	223				
<b>TOTAL FIXED ASSETS</b>	<b>9536</b>	<b>10347</b>	<b>10502</b>	<b>10872</b>	<b>11693</b>	<b>12593</b>
<b>TOTAL ASSETS</b>	<b>11723</b>	<b>13029</b>	<b>12217</b>	<b>12534</b>	<b>14158</b>	<b>15303</b>
<b>LIABILITIES</b>						
Bank overdraft	204	829	165	-	-	-
Accounts payable employees	155	168	150	200	225	250
Accounts payable other	1361	1396	1377	1200	1275	1350
Contribution received in advance	-	370	-	-	-	-
<b>TOTAL LIABILITIES</b>	<b>1720</b>	<b>2763</b>	<b>1692</b>	<b>1400</b>	<b>1500</b>	<b>1600</b>
<b>FUND BALANCES</b>						
Invested in fixed assets	9536	10347	10502	10872	11693	12593
Unexpended funds						
Working funds	425	(115)	23	262	965	1110
Special Projects	42	34	-	-	-	-
<b>TOTAL FUND BALANCES</b>	<b>10003</b>	<b>10266</b>	<b>10525</b>	<b>11134</b>	<b>12658</b>	<b>13703</b>
<b>TOTAL LIABILITIES AND FUND BALANCES</b>	<b>11723</b>	<b>13029</b>	<b>12217</b>	<b>12534</b>	<b>14158</b>	<b>15303</b>

1983 - 1984 BUDGET  
TABLE OF POSITIONS AND MAN-POWER

	SENIOR PROFESSIONALS POSITIONS								SCIENTIFIC POSITIONS			
	(1)				(2)				(3)			
	ACT 1981	BUD 1982	BUD 1983	BUD 1984	ACT 1981	BUD 1982	BUD 1983	BUD 1984	ACT 1981	BUD 1982	BUD 1983	BUD 1984
RESEARCH	2	1	1	1	2.0	1.0	1.0	1.0	-	-	-	-
DIRECTION												
CENTRAL SCIENTIFIC UNITS	2	3	4	4	2.0	3.0	3.8	4.0	1	1	1	1
Basic animal sciences	1	2	5	5	1.0	1.7	2.7	5.0	-	2	1	1
Legume agronomy	-	-	3	3	-	-	-	3.0	-	-	-	-
Animal traction	1	3	3	3	1.0	2.5	3.0	3.0	-	1	1	1
Livestock policy	1	1	1	1	1.0	1.0	1.0	1.0	-	1	1	1
Trypanotolerance												
CENTRAL SUPPORT SERVICES												
HQ farm and lab.	1	2	-	-	1.0	2.0	-	-	2	2	2	2
Computer unit	2	2	3	3	2.0	2.0	2.0	3.0	2	3	3	3
Aerial survey & Cartography	2	3	2	2	2.0	2.8	2.0	2.0	1	1	1	1
ARID ZONES												
Mali	6	6	3	3	5.0	3.6	2.5	2.5	9	9	9	9
Niger	-	1	2	2	-	0.5	2.0	2.0	-	1	1	1
Kenya	6	4	3	1	5.2	3.5	3.0	1.0	4	5	5	5
Botswana	1	1	1	1	0.2	0.2	0.4	0.4	-	-	-	-
Ethiopia	1	2	2	2	1.0	1.4	2.0	2.0	2	2	2	2
SUBHUMID ZONE	5	4	3	3	4.3	4.0	3.0	3.0	4	4	4	4
HUMID ZONE	4	4	3	3	4.0	3.3	3.0	3.0	5	5	5	5
HIGHLANDS	4	2	1	1	4.0	1.5	1.0	1.0	5	5	5	5
TOTAL RESEARCH	39	41	40	38	35.7	34.0	32.4	36.9	35	35	35	35
INFORMATION SERVICES	3	3	3	3	2.9	2.0	3.0	3.0	4	4	4	4
TRAINING & CONFERENCES	1	1	1	1	1.0	1.0	1.0	1.0	-	-	-	-
BOARD AND MANAGEMENT	4	5	4	4	2.7	4.5	4.0	4.0	1	1	1	1
ADMINISTRATION	4	5	2	2	4.0	4.3	2.0	2.0	4	4	4	4
GENERAL OPERATIONS	1	1	-	-	1.0	1.0	-	-	1	1	1	1
TOTAL	52	56	50	48	47.3	46.8	42.4	46.9	45	45	45	45

1) Senior professional man-years have been redefined as per the note following Table II.

2) Lower bracket estimate

Table IV

POWER

SCIENTIFIC AND SUPERVISORY POSITIONS									SUPPORT STAFF POSITIONS							
MAN-YEARS									MAN-YEARS							
BUD 1934	ACT 1981	BUD 1982	BUD 1983	BUD 1984	ACT 1981	BUD 1982	BUD 1983	BUD 1984	ACT 1981	BUD 1982	BUD 1983	BUD 1984	ACT 1981	BUD 1982	BUD 1983	BUD 1984
1.0	-	-	-	-	-	-	-	-	2	1	1	1	2.0	1.0	1.0	1.0
4.0	1	1	4	4	1.0	1.0	3.5	4.0	2	2	11	13	2.0	2.0	11.0	13.0
5.0	-	2	5	8	-	2.0	4.0	8.0	3	7	16	29	3.0	7.0	16.0	29.0
3.0	-	-	1	3	-	-	1.0	3.0	-	3	10	12	-	3.0	10.0	12.0
3.0	-	1	2	2	-	0.5	2.0	2.0	-	1	5	5	-	1.0	5.0	5.0
1.0	-	1	1	1	-	0.5	1.0	1.0	1	1	1	1	1.0	1.0	1.0	1.0
-	2	2	4	4	2.0	2.0	4.0	4.0	10	17	29	29	10.0	17.0	29.0	29.0
3.0	2	3	2	2	2.0	1.6	2.0	2.0	2	5	6	6	2.0	5.0	6.0	6.0
2.0	1	1	1	1	1.0	0.6	1.0	1.0	7	7	4	4	7.0	7.0	4.0	4.0
2.5	9	9	9	9	7.1	8.0	9.0	9.0	135	90	53	53	135.0	96.0	53.0	53.0
2.0	-	1	4	5	-	0.5	3.1	5.0	-	3	15	33	-	2.5	15.0	33.0
1.0	4	5	5	3	4.0	5.0	4.5	3.0	22	26	24	20	22.0	26.0	24.0	20.0
0.4	-	-	-	-	-	-	-	-	2	2	2	2	2.0	2.0	2.0	2.0
2.0	2	2	2	2	2.0	2.0	2.0	2.0	3	2	2	2	3.0	2.0	2.0	2.0
3.0	4	4	6	6	3.4	4.0	5.5	6.0	30	31	31	31	30.0	31.0	31.0	31.0
3.0	5	4	5	5	4.4	3.2	5.0	5.0	30	31	32	32	30.0	31.0	32.0	32.0
1.0	5	6	8	8	5.0	6.0	7.5	8.0	39	32	32	32	39.0	32.0	32.0	32.0
36.9	35	42	59	63	31.9	37.1	55.1	63.0	288	268	274	305	288.0	267.1	274.0	305.0
3.0	4	5	5	5	4.0	5.0	5.0	5.0	29	32	32	32	29.0	32.0	32.0	32.0
1.0	-	-	1	1	-	-	1.0	1.0	4	4	3	3	4.0	3.4	3.0	3.0
4.0	1	1	1	1	0.5	0.5	0.5	0.5	4	5	9	9	4.0	8.0	9.0	9.0
2.0	4	5	5	5	4.0	4.3	5.0	5.0	18	17	15	15	16.4	15.5	15.0	15.0
-	1	3	3	3	1.0	2.6	3.0	3.0	71	70	69	69	71.0	68.6	69.0	69.0
46.9	45	56	74	78	41.4	49.5	69.6	77.5	414	399	402	433	412.4	394.6	402.0	433.0

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ASSUMPTIONS ON PRICE INCREASES AND  
FLUCTUATIONS OF EXCHANGE RATES  
1983 BUDGET PROPOSALS  
(in '000)

Table V

EXPENSE CATEGORIES	IN 1982 \$ COST												US \$	Total
	ET.BIRR AMT \$ Equiv.		CFA AMT \$ Equiv.		NAIRA AMT \$ Equiv.		F. MALIAN AMT \$ Equiv.		KSH AMT \$ Equiv.		PULA AMT \$ Equiv.			
Personnel	3933	1943	34800	116	517	775	147500	240	2420	242	9	10	3166	6493
Supplies/services	2013	982	13500	45	224	336	90000	150	1240	174	9	10	1421	3063
Travel	820	400	4500	15	30	45	33000	55	520	52	-	-	10	587
Equip. Replac.	-	-	-	-	-	-	-	-	-	-	-	-	95	95
<b>TOTAL</b>	<b>6816</b>	<b>3325</b>	<b>52300</b>	<b>176</b>	<b>771</b>	<b>1156</b>	<b>270600</b>	<b>451</b>	<b>4280</b>	<b>423</b>	<b>13</b>	<b>20</b>	<b>4692</b>	<b>10243</b>

EXPENSE CATEGORIES	IN 1983 \$ COST												US \$	Total
	ET.BIRR AMT \$ Equiv.		CFA AMT \$ Equiv.		NAIRA AMT \$ Equiv.		F. MALIAN AMT \$ Equiv.		KSH AMT \$ Equiv.		PULA AMT \$ Equiv.			
Personnel	4342	2113	37500	126	623	935	162000	270	2640	264	10	11	3453	7177
Supplies/services	2227	1133	16200	54	272	408	108000	130	1430	143	10	11	1643	3577
Travel	932	479	5400	18	36	54	39000	56	740	74	-	-	12	703
Equip. Replac.	-	-	-	-	-	-	-	-	-	-	-	-	109	109
<b>TOTAL</b>	<b>7647</b>	<b>3730</b>	<b>59400</b>	<b>198</b>	<b>931</b>	<b>1397</b>	<b>309000</b>	<b>516</b>	<b>4810</b>	<b>481</b>	<b>20</b>	<b>22</b>	<b>5222</b>	<b>11560</b>

## CAPITAL REQUIREMENTS

1982-1983

Table VI

## SUMMARY

## BUDGET

	1982	1983	
		Lower	Upper
Category 1 (construction)	253	150	150
Category 2 (equipment)	272	163	213
<b>Total</b>	<b>525</b>	<b>313</b>	<b>363</b>
<b>HEADQUARTERS</b>			
<b>Remedial works</b>			
Repair drainage	50	35	35
Install incinerator and generator	25	-	-
Install backup generator	-	25	25
Complete hostel accommodation	-	40	40
Improve water supply	-	20	20
<b>Subtotal</b>	<b>75</b>	<b>120</b>	<b>120</b>
<b>New Construction</b>			
Greenhouse	-	30	30
Potting shade	10	-	-
<b>Subtotal</b>	<b>10</b>	<b>30</b>	<b>30</b>
<b>Farm area development</b>			
Fencing	20	-	-
Drainage works	30	-	-
<b>Subtotal</b>	<b>50</b>	<b>-</b>	<b>-</b>
<b>Equipment</b>			
<b>Computer facilities</b>			
Terminals	20	-	-
Micro-computer	20	-	-
Increased disc storage	-	31	31
Software	10	8	3

## S U M M A R Y

## B U D G E T

	1982	1983	
		Lower	Upper
		-----	-----
Vehicles	40	-	-
Audiovisual equipment	9	-	-
Hostel furniture	30	-	-
Workshop equipment	10	-	-
Cultivation equipment	-	30	30
Veterinary equipment	-	50	50
Microbiology equipment	-	-	50
Animal physiology equipment	-	21	21
	-----	-----	-----
Subtotal	139	140	190
	-----	-----	-----
Total headquarters	274	290	340
	=====	=====	=====
FIELD PROGRAMME			
Arid Zones Mali/Niger			
Office equipment	8	-	-
Office remodelling	4	-	-
Furniture	9	-	-
Traction equipment	5	15	15
Arid Zones Kenya			
Office construction	27	-	-
Micro-computer	7	-	-
Arid Zones Ethiopia			
Office equipment	10	-	-
Radio link	3	-	-
Terminal	5	-	-
Subhumid Zone			
Office construction	10	-	-
Farm equipment	18	-	-
Humid Zone Ibadan			
Micro-computer	-	8	8
Office construction	50	-	-
Agronomy laboratory	25	-	-
Farm equipment	10	-	-
Vet. equipment	10	-	-
Trypanotolerance Programme			
Cattle handling facilities	25	-	-
Equipment	5	-	-
Highlands			
Farm equipment	20	-	-
Radio link	5	-	-
	-----	-----	-----
Total field programmes	251	23	23
	-----	-----	-----
Total requirements	525	313	363
	=====	=====	=====