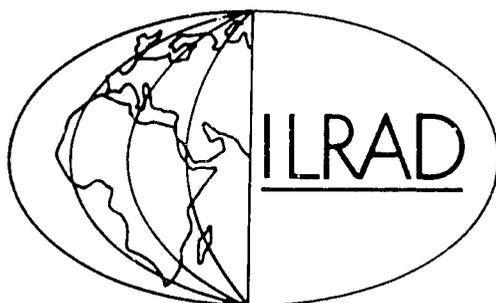


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Funding Requirements for 1989



INTERNATIONAL LABORATORY FOR RESEARCH ON ANIMAL DISEASES

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FUNDING REQUIREMENTS FOR 1989

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FUNDING REQUIREMENTS FOR 1989

Introduction

The International Laboratory for Research on Animal Diseases (ILRAD) was established in 1973 with a mandate to conduct intensive research leading to improved control of livestock diseases. ILRAD now occupies a modern complex of research laboratories and support facilities at Kabete on the outskirts of Nairobi, Kenya, and has a cattle breeding ranch at Kapiti, about 50 km from Nairobi. Research and training activities concentrate on immunological and related aspects of two diseases which seriously limit livestock production in Africa and other developing regions of the world - African animal trypanosomiasis and East Coast fever (ECF), a virulent form of theileriosis.

Despite intensive research efforts at ILRAD and in other laboratories, measures for the control of ECF and trypanosomiasis are far from satisfactory. Control of ECF is based primarily on control of the tick vector by regular acaricide treatment plus pasture management and exclusion of wildlife. Two drugs have been marketed for the treatment of infected animals, but they are expensive and require early diagnosis if treatment is to be successful.

Control of trypanosomiasis is based on insecticidal control of the tsetse vectors and trypanocidal drugs to prevent infection and to treat infected animals. New techniques have been developed to control some tsetse species. Overall, however, the area of Africa infested by tsetse has increased rather than diminished. At the same time, no new trypanocidal drug has been introduced for general use for nearly 30 years, and the potential development of drug-resistant trypanosomes remains a serious threat.

During 1987, attention was given to a number of recommendations by the External Program and Management Review Teams which reported on the stage of development of ILRAD's facilities and programs to the CGIAR and TAC in 1986. Research program management was strengthened by the appointment of Coordinators for the theileriosis and trypanosomiasis research programs. The Director of Research and the Coordinators of the theileriosis and trypanosomiasis programs comprise a research review committee. This committee considers program needs and progress and provides input into program formulation and assessment as well as policy direction by the Program Committee of the Board of Directors.

The trypanosomiasis research program was partly re-structured to give increased emphasis to research activities with a potential pay-off in the shorter term. One project area now includes work on the development of diagnostic tests, improved chemotherapy, prevention or management of drug resistance, epidemiology of infections and use of trypanotolerant livestock.

The construction of a new laboratory unit, changes in the use of three existing laboratories, and some regrouping and relocation of scientific staff to relieve congestion and meet new program needs were also put into effect during the year.

It should be noted that during 1987 ILRAD prepared proposals for programs of research and training related to the improved control of theileriosis and trypanosomiasis for the five-year period 1988-1992. These medium-term proposals take into account ILRAD's short-term and long-term research strategies and the recommendations of the External Program and Management Reviews. The proposals were approved by the Technical Advisory Committee of the CGIAR in June and recommended successfully to the donors for funding during International Centres Week in Washington in October. The acceptance of research planning on a five-year basis by the CGIAR is a welcome development, since it eases the burden of annual detailed program and budget reviews by TAC and gives appropriate recognition to the long-term nature of many aspects of basic agricultural research.

Research Highlights for 1987-1988

The results of ILRAD's research program on theileriosis and trypanosomiasis, an account of the work of the training and information services, and the activities of the research support units during 1987 are given in the 1987 Annual Report and Research Highlights. However, some notable achievements from the programs should be recognized. In the theileriosis program, field trials to test the efficacy of infection with theileria sporozoites plus antibiotic treatment as a means of immunization against ECF have been completed in Kenya. A well-characterized and immunogenic strain of *Theileria parva* has been made available to the Kenya Agricultural Research Institute for field evaluation as a potential vaccine strain to control theileriosis in the Coast Province.

The search for antigens of *Theileria* parasites, which might be used in vaccines, identified two candidate molecules in the sporozoite and a schizontic protein recognized by monoclonal antibodies previously used to characterize *Theileria* strains. The genes encoding these molecules are under active study. Techniques to transfer genes from one cell to another have been introduced to facilitate studies on immune mechanisms in theileriosis.

Studies on the bovine immune system are a basic requirement for ILRAD's research programs on both theileriosis and trypanosomiasis and have wider relevance in the context of immunity against other diseases. Monoclonal antibodies were prepared during 1987 which recognize subsets of bovine B-lymphocytes and macrophages. These will supplement monoclonals identified in previous years to characterize subsets of bovine T-lymphocytes.

Research on the bovine major histocompatibility complex, which has a fundamental role in immunogenesis, moved from definition of Class I molecules to more emphasis on Class II molecules.

Work done on the nature of trypanotolerance in cattle clearly demonstrated the superior ability of N'Dama cattle to control parasitaemia and maintain haematological values during repeated trypanosome infections. N'Dama cattle recovered from repeated trypanosome infection without chemotherapy and responded more quickly than Boran cattle when re-exposed to infection with parasites experienced earlier. The role of immunological memory in N'Dama cattle is being investigated actively because of the potential implications for vaccine development.

Progress has been made to perfect highly specific diagnostic techniques for trypanosome infections based on the detection of parasite antigens in body fluids of infected animals. Various approaches have been used to improve techniques for the field use of DNA probes to distinguish between morphologically identical organisms such as *T. simiae* and *T. congolense* in tsetse flies.

The work of the African Trypanotolerant Livestock Network on the productivity of livestock kept under difficult conditions of tsetse and trypanosomiasis risk, organized in collaboration with ILCA and scientists in eight countries, was reviewed during an international conference. The future direction of Network activities and the exploitation of findings to date were planned.

The bovine lymphocyte antigens (BoLA) of N'Dama cattle from two Network sites were typed and found to have similarities with those from both European and Zebu breeds. The overall pattern of types of lymphocytes from the N'Dama cattle indicated that some selection for certain Class I antigen types has taken place within the breed.

During 1987, the socio-economics unit began work to assess the likely impact of improved control of livestock diseases in economic, social and environmental terms. They will concentrate in the first instance on aspects of the epidemiology and control of theileriosis.

A full program of training activities was continued during 1987 with 18 scientists principally from universities and veterinary research laboratories in Africa visiting ILRAD for technical experience and collaborative research programs for periods varying from one to six months. Fifteen graduate students from African countries supported by ILRAD fellowships worked for higher degrees, and two visiting post-doctoral senior research fellows had research program attachments for periods of a year.

Information services published four issues of ILRAD Reports, an Annual Report and a report of the proceedings of a workshop on parasite antigens. The new training and outreach building, completed in early 1988 with special funds provided by the Government of The Netherlands, will provide a much improved home base for expanded training, outreach and collaborative research activities in the years ahead.

Financial Results for 1987

Total operating costs were as expected (Table 1). However, expenditures for supplies and services exceeded the budget primarily because a weaker dollar meant increased costs for supplies and services purchased from Europe (Table 2). Bringing a new laboratory into service also led to certain unanticipated costs. The over-expenditures were balanced by an under-expenditure in salaries. Recruitment activities were not as successful as planned, and four senior man-years were not utilized. Capital expenditures were somewhat more than predicted, primarily because of a \$300,000 addition to working capital. Details can be found in the ILRAD publication entitled *1987 Accounts and Financial Report*.

Financial Resources for 1988

The 1988 final revised budget follows the program approved by the CGIAR in October 1987. Total funding requirements are US \$13.05 million. ILRAD hopes to attract new donors in 1988 and to receive additional funds from its traditional donors. It should be possible to obtain the funds required for the full program. There will be no increase in senior positions in 1988 (Table 3).

The costs of livestock disease research will increase by 7.5% in 1988 over 1987 levels. Research will account for nearly 63% of the total core requirements (see Table 1).

In addition, ILRAD expects increased operating costs of \$100,000 in the Training, NARS Counselling and Conference activities. To further strengthen these activities as well as documentation and dissemination, the Board approved construction and equipping of a new Training Building. Construction was completed in March, 1988. Special project funding was donated by The Netherlands.

The final revised capital expenditure of \$690,000 will be \$280,000 less than 1987. This will be divided almost equally between new equipment and small construction and site improvement projects.

PROPOSALS FOR ESSENTIAL ACTIVITIES IN 1989

Financial Resources for 1989

The 1989 proposed budget is essentially the same as projected in the medium-term budget document *Program Plans and Funding Requirement: 1988-1992*. It exceeds the final revised operating budget for 1988 by US \$640,000 for price increases and US \$330,000 for core operations. The funding requirement of US \$14 million is 8% higher than the requirement for 1988.

The proposal for 1989 includes the funds required to maintain the current research program, to increase research in the epidemiology of East Coast fever (adding one senior position) and to increase efforts in training. Disease research and research support costs will comprise 57% of proposed expenditure for the Operations Budget. Training activities will increase over 1988 and are expected to be almost 8% of the operating budget. General administration and operation costs will be approximately 22% of the Operations Program.

Budgets for essential activities and sources of funds for 1987-1989 are given below:-

	1987 Actual	1988 Current	1989 Proposed
	US\$'000		
Operations Program	11340	12360	12690
Price Increase	-	-	640
Capital	962	690	710
Total Funding Requirement	12302	13050	14040
Source of Funds Received or Expected:			
Restricted	2582	2632	2920
Unrestricted	7587	8268	8820
World Bank	1250	1950	2100
Earned Income	315	200	200
Fund balance applied	567	0	0
Total	12302	13050	14040

The Kenya shilling continued to retain its value against the US dollar in 1987. The consumer price index in Kenya increased by an estimated 9%. These trends are expected to continue in 1988. Price increases in North America and Europe are expected to be below the level for Kenya, and an overall provision of 5% for price increases has been made for 1989.

Capital requirements for 1989 will depend partly upon research progress and decisions concerning programs. General capital equipment requirements have been estimated in line with past experience. A nucleotide synthesizer will be needed in 1989.

Research Programs for 1989

Research priorities in 1989 will follow the plan set out in the medium-term budget.

In Theileriosis Research, priority will be given to the development of new vaccines against both the sporozoite and schizont stages of the parasite. Special attention will be given to assessing the vaccine potential of isolated sporozoite components. Emphasis will continue to be placed on the improvement and application of the infection-and-treatment method of immunization in collaboration with national organizations in the affected countries of Eastern Africa.

In Trypanosomiasis Research, both short- and long-term research strategies will be pursued. Emphasis will be given to the validation and application of new diagnostic tests and the improved use of chemotherapy while long-term research programs will continue to search for new immunological, chemotherapeutic or genetic means of control of this disease.

Development of methodologies and collection of data to assess the economic, social and environmental impact of improved control measures for theileriosis and trypanosomiasis will continue.

The EEC approved funding in 1985 for a special research project on trypanotolerant N'Dama cattle to be conducted jointly by ILRAD and ILCA. This project is the research component of a larger regional project developed by the Government of The Gambia and funded by several donors. While the goal is to increase the production and export of N'Dama cattle, this project enables ILRAD to carry out substantial research on the mechanisms of trypanotolerance. The project will complete its first three-year period in 1988. Proposals to extend this research project for three years are being considered.

Desirable Activities

Two senior scientific man-years of desirable activities were completed in 1987. One scientist is working in Theileria, funded by France, and another is working in Trypanosomiasis, funded by Japan. The same research is planned for 1988 and 1989.

In 1987 ILRAD started construction of the Training and Outreach Building which was funded by the Government of The Netherlands. Of the US\$500,000 donated for this project, \$263,000 was expended in 1987. The remainder was used to complete the building in 1988.

ILRAD still wishes to complete the final laboratory block. Funds are still being sought for construction to begin in 1989.

Table 1a. ESSENTIAL PROGRAM AND ACTIVITY REQUIREMENTS, 1987-1989 (senior man-years and US\$'000)

Activities	1987 plan		1987 actual		1988 plan		1989 proposal	
	Staff	SMY	Staff	SMY	Staff	SMY	Staff	SMY
1. Operations Program								
Livestock Disease Research								
Trypanosomiasis								
a) Epidemiology	8.5	891	7.4	898	8.1	966	8.1	963
b) Biology/Biochemistry	10.8	1132	10.6	1273	10.6	1264	10.6	1261
c) Immunology	5.3	556	4.5	602	5.4	644	5.4	642
d) Resistance mechanisms	3.4	356	3.6	422	4.1	489	4.2	500
Total	28.0	2935	26.1	3195	28.2	3362	28.3	3366
Theileria								
a) Epidemiology	3.5	367	3.2	401	3.5	422	4.5	553
b) Sporozoite immunization	4.1	430	3.9	451	4.0	482	4.0	492
c) Schizont immunization	9.4	995	9.3	1087	9.6	1158	9.5	1167
Total	17.0	1782	16.4	1939	17.1	2062	18.0	2212
Research Support	3.2	1966	3.2	1798	3.2	1991	3.2	2067
Total Disease Research	48.2	6693	45.7	6932	48.5	7415	49.5	7645
Economic & Social Analysis								
at micro level	3.0	390	1.7	176	3.0	421	3.0	432
Training								
a) specialized courses		140		50		130		149
b) visiting scientists		38		30		48		71
c) post-doctoral		591		530		565		577
d) degree related		197		267		216		221
Total	1.0	966	1.0	877	1.0	959	1.0	1018
Counselling & Advising NARS	0.5	60	0.0	30	0.7	80	1.0	130
Conferences and Seminars		91		115		110		90
Documentation & Dissemination	1.0	461	1.0	447	0.8	447	1.0	456
General Administration	3.0	1274	3.0	1408	3.0	1512	3.0	1454
General Operations	2.0	1389	2.0	1355	2.0	1416	2.0	1465
Operations Subtotal	58.7	11324	54.4	11340	59.0	12360	60.5	12690
Price Increase								640
TOTAL OPERATIONS		11324		11340		12360		13330
2. Capital								
Construction		260		354		130		200
Equipment		290		309		460		430
Total		550		663		590		630
3. Additional working capital		20		300		100		30
TOTAL REQUIREMENTS		11894		12303		13050		14040

Table 1b. DESIRABLE PROGRAM AND ACTIVITY REQUIREMENTS, 1987-1989

2. Capital				
Construction		263		600

Activities	1990 projected		1991 projected		1992 projected	
	Staff SMY	Amount	Staff SMY	Amount	Staff SMY	Amount
1. Operations Program						
Livestock Disease Research						
Trypanosomiasis						
a) Epidemiology	8.1	966	8.3	1003	8.6	1049
b) Biology/Biochemistry	10.6	1265	10.4	1257	10.0	1219
c) Immunology	5.5	656	5.5	665	5.5	671
d) Resistance mechanisms	4.3	513	4.3	520	4.4	536
Total	28.5	3400	26.5	3445	28.5	3475
Theileria						
a) Epidemiology	4.9	590	5.5	649	5.7	680
b) Sporozoite immunization	4.0	482	4.0	472	4.0	478
c) Schizont immunization	9.6	1156	9.5	1121	9.5	1134
Total	18.5	2227	19.0	2242	19.2	2292
Research Support	3.2	2100	3.2	2113	3.2	2150
Total Disease Research	50.2	7727	50.7	7800	50.9	7917
Economic & Social Analysis						
at micro level	3.0	485	3.0	500	3.0	500
Training						
a) specialized courses		156		145		151
b) visiting scientists		75		75		75
c) post-doctoral		640		705		715
d) degree related		275		280		282
Total	1.0	1146	1.0	1205	1.0	1223
Counselling & Advising NARS	1.0	150	1.0	170	1.0	175
Conferences and Seminars		90		90		90
Documentation & Dissemination	1.0	485	1.0	493	1.0	500
General Administration	3.0	1380	3.0	1410	3.0	1440
General Operations	2.0	1498	2.0	1540	2.0	1590
Operations Subtotal	61.2	12961	61.7	13208	61.9	13435
Price Increase		1042		1470		1915
TOTAL OPERATIONS		14003		14678		15350
2. Capital						
Construction		150		150		150
Equipment		320		320		320
Total		470		470		470
3. Additional working capital						
		50		54		55
TOTAL REQUIREMENTS		14523		15202		15875

TABLE 2. SUMMARY OF COSTS BY OBJECT OF EXPENDITURE, 1987-1992 (US\$'000)

	1987 REVISED	1987 ACTUAL	1988 PLAN	1989 PROPOSED	1990 PROJ.	1991 PROJ.	1992 PROJ.
PERSONNEL	6785	6547	7113	7478	7680	7869	8020
SUPPLIES	2728	2854	2985	3090	3142	3150	3190
SERVICES	784	1019	1042	1072	1095	1120	1140
EQUIPMENT REPLACEMENT	344	564	454	370	356	369	375
TRAVEL	643	548	666	680	688	700	710
OTHER/CONTINGENCY	40	8	100				
SUBTOTAL	11324	11340	12360	12690	12961	13208	13435
PRICE INCREASE				640	1042	1470	1915
TOTAL OPERATING COSTS	11324	11340	12360	13330	14003	14678	15350

TABLE 3. SUMMARY OF MAN-YEARS, 1987-1992

	1987 REVISED	1987 ACTUAL	1988 PLAN	1989 PROPOSED	1990 PROJ.	1991 PROJ.	1992 PROJ.
SENIOR SCIENTIFIC/ADMINISTRATIVE	58.7	54.4	59.0	60.5	61.2	61.7	61.9
SUPERVISORY	38.0	36.0	37.0	38.0	38.0	39.0	39.0
SUPPORT	313.0	324.6	336.0	338.0	338.0	345.0	354.0
TOTAL MAN-YEARS	409.7	415.0	432.0	436.5	437.2	445.7	454.9

TABLE 4. BALANCE SHEETS FOR ALL ACTIVITIES, 1987-1989 (US\$'000)

	1987 Actual	1988 Plan	1989 Proj.
ASSETS			
Cash & short-term deposits	1953	2037	1437
Accounts receivable	1646	687	627
Inventories	405	476	546
Other assets	835	591	591
Property, plant & equipment	20859	21576	23255
TOTAL	25698	25367	26516
LIABILITIES & FUND BALANCES			
Liabilities			
Accounts payable & other liabilities	1894	2078	2078
Payments in advance from donors	1483		
SUBTOTAL	3377	2078	2078
Fund Balances			
Capital	20859	21576	23255
Operating	1270	1213	1083
Self-sustaining	100	100	100
Capital development	92	400	0
SUBTOTAL	22321	23289	24438
TOTAL	25698	25367	26516

TABLE 5. FUNDING SOURCES FOR 1987 AND 1988 (US\$ millions)

	1987 Actual	1988* Pledged	1988 Estimated	1988 Total
Unrestricted				
USAID	2.150	2.15		
World Bank	1.250	1.50	0.25	
UK	1.067	1.31		
Canada	0.781	0.33		
Germany	0.703	0.76		
Switzerland	0.644	0.83		
Netherlands	0.406	0.47		
Japan	0.361		0.50	
Sweden	0.377	0.41		
Belgium	0.268		0.23	
Italy	0.232	0.25		
Norway	0.292	0.32	0.30	
AfDB	0.190		0.20	
Denmark	0.092	0.10		
India	0.024	0.03		
Not identified			0.21	
Total Unrestricted	8.837	9.056	1.385	10.441
Restricted				
UNDP	0.828	0.70		
Italy	0.570	0.50		
Rockefeller	0.209	0.48		
Japan	0.225		0.17	
Belgium	0.195		0.20	
France	0.131		0.13	
Total Restricted	1.832	1.675	0.50	2.178
TOTAL	10.669			12.619
Special Project (for essential program)				
EEC	0.204		0.23	
Netherlands	0.220		-	
Total Special	0.424		0.23	
Earned income	0.315		0.20	
Funds applied	0.567		0.00	
Total funds	11.876			13.050
Required	12.302			13.050

*1988 based on information available up to 1 August.