



IFAD
INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT
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REPORT AND RECOMMENDATION OF THE PRESIDENT

TO THE EXECUTIVE BOARD ON A PROPOSED LOAN TO

THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

FOR

THE AGRICULTURAL RESEARCH AND TRAINING PROJECT



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CURRENCY EQUIVALENTS

Currency Unit	=	Birr (ETB)
USD 1.00	=	ETB 6.737 (August 1997)
ETB 1.00	=	USD 0.15

WEIGHTS AND MEASURES

1 kilogram (kg)	=	2.204 pounds (lb)
1 000 kg	=	1 metric tonne (t)
1 kilometre (km)	=	0.62 miles (mi)
1 metre (m)	=	1.09 yards (yd)
1 square metre (m ²)	=	10.76 square feet (ft ²)
1 acre (ac)	=	0.405 ha
1 hectare (ha)	=	2.47 acres

ABBREVIATIONS AND ACRONYMS

ARF	Agricultural Research Fund
ARTP	Agricultural Research and Training Project
AUA	Alemaya University of Agriculture
EARO	Ethiopian agricultural research organization
EARS	Ethiopian Agricultural Research System
IDA	International Development Association
M&E	Monitoring and evaluation
RC	Research centre
DG	Director General

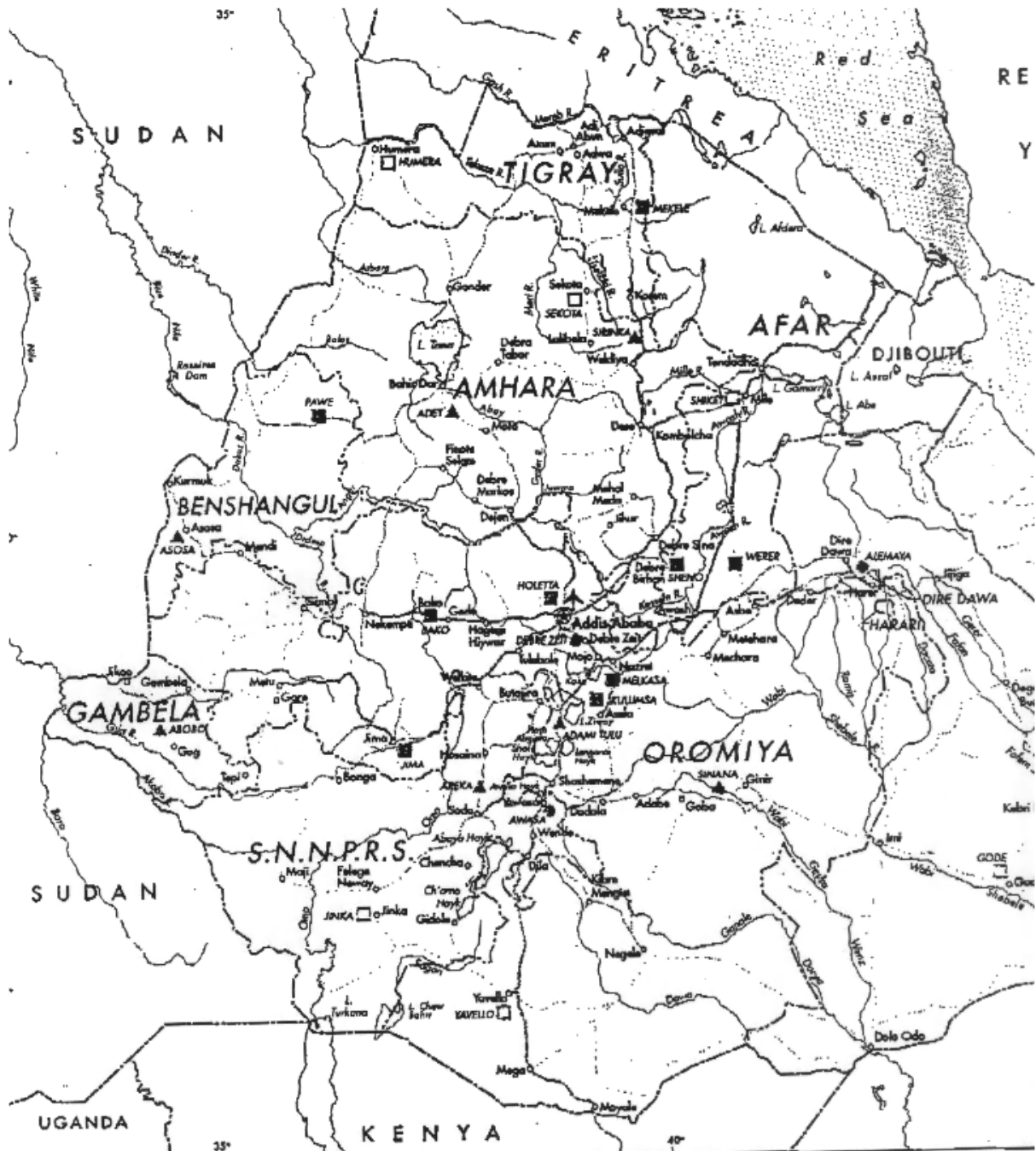
GOVERNMENT OF THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Fiscal Year

8 July - 7 July

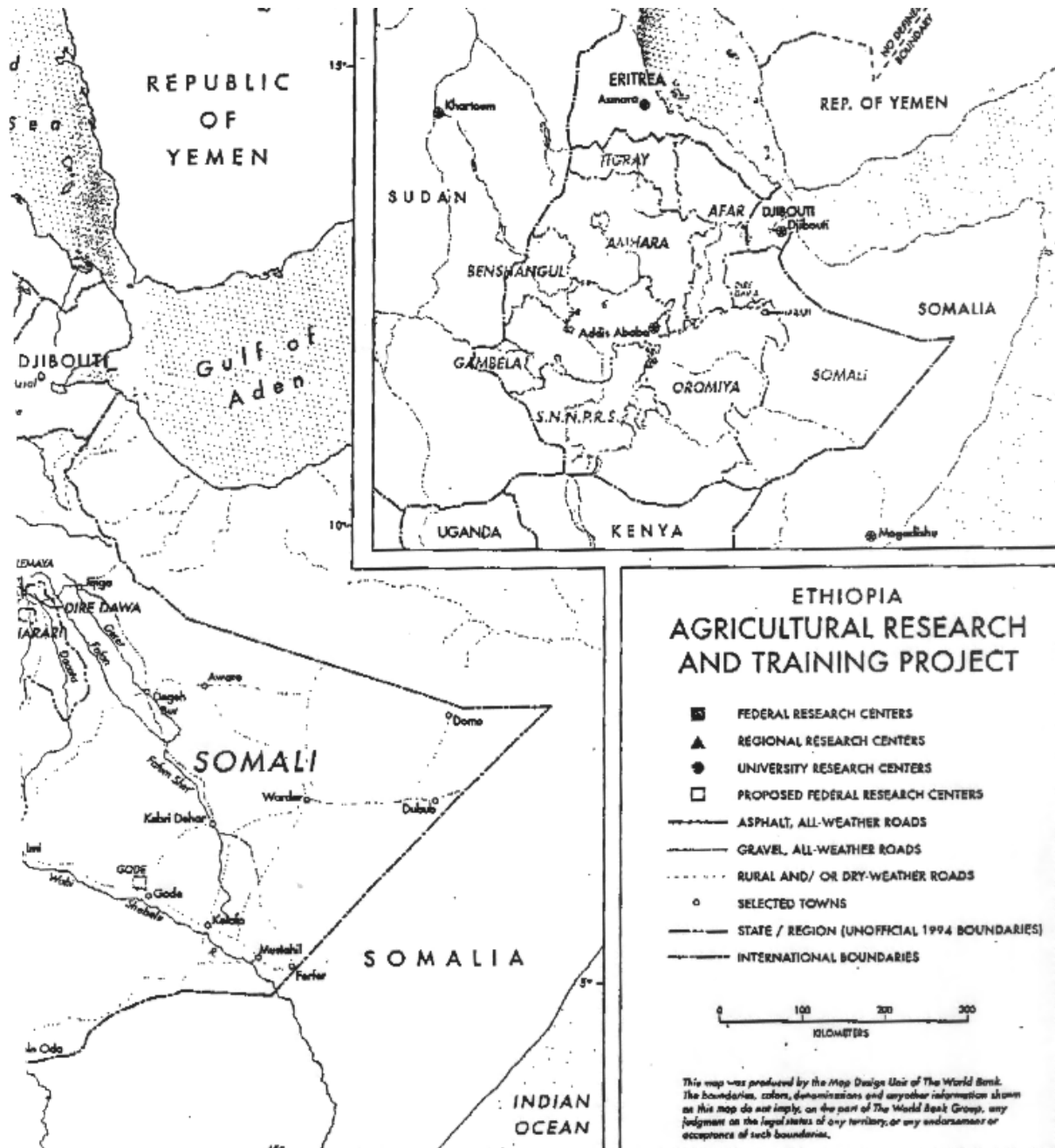


MAP OF THE PROJECT AREA



Source: World Bank

The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.



Source: World Bank

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FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
AGRICULTURAL RESEARCH AND TRAINING PROJECT
LOAN SUMMARY

INITIATING INSTITUTION:	International Development Association (IDA)
BORROWER:	Federal Democratic Republic of Ethiopia
EXECUTING AGENCY:	Ethiopian Agricultural Research Organization (EARO)
TOTAL PROJECT COST:	USD 90.6 million
AMOUNT OF IFAD LOAN:	SDR 13.65 million (equivalent to approximately USD 18.2 million)
TERMS OF IFAD LOAN:	40 years, including a grace period of ten years, with a service charge of three fourths of one per cent (0.75%) per annum
COFINANCIER:	IDA
AMOUNT OF COFINANCING:	USD 60.0 million
CONTRIBUTION OF THE BORROWER	USD 12.4 million
APPRAISING INSTITUTION:	IDA/IFAD
COOPERATING INSTITUTION:	IDA



PROJECT BRIEF

Who are the beneficiaries?

The beneficiaries of the Agricultural Research and Training Project (ARTP) are the 6 million smallholder farmers, most with holdings of less than one hectare each. These smallholder farmers constitute 90% of the farming population and account for 96% of total agricultural production. About 72% of these households have holdings of 0.73 ha each, which is inadequate to produce enough food to meet the requirements for the average family of five using existing production technologies. In addition, the ARTP will benefit women as farmers and farmworkers by developing production technologies geared to improve the efficiency and reduce the drudgery of farm operations in which they are involved. It will also address the constraints faced in post-harvest food processing and storage. By extending the coverage of agricultural research to hitherto unaddressed, marginal, arid and semi-arid agro-ecologies, the ARTP will reinforce the resilience of the poorest segments of rural households to better cope with drought and famine situations.

Why are they poor?

Despite its considerable agricultural potential, Ethiopia is still a food-deficit country in the aggregate due largely to: prolonged civil war and neglect during the Derg regime; recurring droughts; rapid population growth; low genetic potential of crop varieties and livestock breeds; the lack of or failure to make use of improved production technologies; the limited use of the country's irrigation potential; and farming practices that contributed to declining soil fertility, low productivity and land degradation.

What will the proposed project do for them?

The sustained generation and adoption of ecologically sound crop and livestock-production technologies will increase yield and productivity per unit of land and thereby farmer incomes, leading to improved and sustainable household food security. The adoption of production technologies more responsive to the needs of smallholder farmers will enhance natural resource use and management, improve soil fertility, reduce land degradation by minimizing pressure on marginal lands and strengthen the overall capacity of the agricultural sector to provide for and feed, in a sustainable way, the growing population. Furthermore, women will benefit from the generation of improved post-harvest technologies and other labour-saving techniques aimed at reducing drudgery in farm operations.

How will the beneficiaries participate in the project?

At the grass-roots level, the ARTP will support the establishment of farmer research groups based on specific research topics to be identified jointly with beneficiaries using participatory rural appraisal techniques. The ARTP will also support joint outreach programmes to be carried out by research and extension staff in collaboration with farmers. At the research centre or zonal and regional levels, farmers' elected representatives will be full members of the research and extension advisory councils with responsibility for, *inter alia*, approving the annual work plan and budget for the research centre and assessing the performance of research programme(s) during the past year. The planned study on the particular needs of women farmers in relation to the development and transfer of improved technologies will provide an added opportunity to articulate and enhance their role in setting and directing the agenda for agricultural research.



**REPORT AND RECOMMENDATION OF THE PRESIDENT OF IFAD
TO THE EXECUTIVE BOARD ON A PROPOSED LOAN TO
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FOR
THE AGRICULTURAL RESEARCH AND TRAINING PROJECT**

I submit the following Report and Recommendation on a proposed loan to the Federal Democratic Republic of Ethiopia for SDR 13.65 million (equivalent to approximately USD 18.2 million) on highly concessional terms to help finance the Agricultural Research and Training Project. The loan will have a term of 40 years, including a grace period of ten years, with a service charge of three fourths of one per cent (0.75%) per annum. It will be administered by the International Development Association (IDA) as IFAD's cooperating institution.

PART I - THE ECONOMY, SECTORAL CONTEXT AND IFAD STRATEGY¹

A. The Economy and Agricultural Sector

1. **The economy.** With a population of 58.1 million, Ethiopia is sub-Saharan Africa's second most populous country. Its social indicators are among the lowest in the world. The per capita GNP of USD 110 is roughly one-fourth of the average for sub-Saharan Africa. Infant mortality is high at 112 per 1 000 live births and malnutrition among children under five years is estimated at 47%. Only about 27% of school-age children are enrolled in primary schools. Approximately 60% of Ethiopians live beneath the absolute poverty level. The estimated average per capita calorie intake is below 80% of the level considered necessary for a healthy life. In the last two decades, population growth averaged about 3% per annum and is projected to grow at 2.7% per year until the turn of the century. Food insecurity is a structural problem exacerbated by intermittent drought which, when combined during the 1980s with civil war, produced widespread famine. Ethiopia's overall ranking on the 1997 Human Development Index remained low at 170 out of 175 countries. Ethiopia's political economy has undergone successive radical changes in the last two decades. After the 1974 revolution, the Derg regime instituted land reform, central planning and state control over investment, production and trade. The overthrow of the Derg regime in 1991 was followed by a government committed to democracy, decentralization, divestiture and liberalization of the economy. Political stability, economic liberalization and the absence of widespread drought have contributed to the impressive overall economic performance in the last five years. Real GDP grew by an average rate of about 8% during that period. Domestic inflation has also been tamed from more than 20% in 1991-92 to well below 2% in 1996-97.

2. **The agricultural sector.** Agriculture is the main stay of the Ethiopian economy and the major source of employment and livelihood for about 85% of the population. It contributes about 85% of export earnings and more than 40% of GNP. In addition, the agricultural sector is a major source of raw materials for agro-industries. The ratio of crop and livestock production in agricultural GDP is about 70% and 30%, respectively. Agricultural growth averaged 2.2% per annum during the 1960s, but dropped to 0.7% in the 1970s and 0.5% in the 1980s. Its contribution to GDP dropped from 65% in

¹ See Appendix I for additional information.



1960 to 40% today. The total area under cultivation increased marginally from about 5.7 million ha in the early 1980s to an estimated 6 million in the 1990s. In addition, loss of fertile soil through erosion poses a serious threat to agricultural productivity. Crop yields have remained virtually static, a reflection of inadequate crop and livestock-production technologies, including the low use of improved seed varieties and fertilizer, leading to chronic food-deficit per capita.

3. Since 1991, the policy and institutional reforms undertaken by the Government have meant that output prices and increasingly input prices, are now largely determined by market forces. However, the Regional Agricultural Bureaux are unevenly prepared and equipped to play their important role in the transfer of improved crop and livestock-production technologies to farmers. In order to enhance the effectiveness of the agricultural extension service, the Government fully supported the initiative launched under Sasakawa Global 2000 to increase substantially the number of demonstration plots from about 350 000 in 1996 to 600 000 in 1997. These demonstrations, combined with better input supplies and good weather, have brought unprecedented increases in food grain production and food imports have virtually stopped. In addition, the Government has been working to alleviate the constraints that have afflicted the agricultural research system and are hindering the steady flow of environmentally sound agricultural production technology to farmers. These constraints include institutional fragmentation and the absence of a national legal entity to guide and coordinate a balanced decentralized regional research effort. Partly as a consequence of this lacuna, there is duplication and lack of overall coordination of research programmes and priorities between federal, regional and university research entities. There are gaps in research programme coverage such that some of the most vulnerable and less favourable environments characterized by resource-poor farmers have no access to improved production technologies. The approach to research, in the absence of participatory mechanisms, is top-down. Moreover, inadequate attention has been paid to livestock, natural resource management and research-extension linkages.

B. Lessons Learned from Previous IDA and IFAD Experience

4. The Implementation Completion Report of the IDA-financed Agricultural Research Project in Ethiopia which was completed two years ago indicated that: (a) project-implementing agencies should be given the financial authority and autonomy to manage resources allocated to them; (b) adequate financial accounting and reporting systems are important prerequisites for efficient resource use and management; and (c) the research-extension linkages, even though essential to sound formulation and implementation of research programmes, do not always operate effectively. Some of these lessons are broadly consistent with the findings of the recent mid-term review of the IFAD-funded Southern Region Cooperatives Development and Credit Project in Ethiopia. These lessons have been taken into account in the design of the Agricultural Research and Training Project (ARTP). Experience from other agricultural research projects in eastern and southern Africa suggest that the institutional development of an agricultural research system, particularly human resource development, is a long-term undertaking. The staff development and placement plan under the ARTP has, therefore, been prepared in such a manner as to ensure the availability of a critical mass of skilled personnel compatible with the pace of project activities. Experience under the Southern Region Cooperatives Development and Credit Project in Ethiopia and the Informal Seed Component of the Seed Systems Development Project demonstrated, however, how equally important is the need to invest in the mechanisms through which the rural poor can articulate their needs and provide effective guidance to the delivery of public services.

C. IFAD's Strategy for Collaboration with Ethiopia

5. IFAD's country strategy has focused on the exploitation of opportunities for improved household food security and family nutritional status in the densely populated medium and high potential areas of the country characterized by chronic and transitory poverty. The strategy seeks to increase food production and the productivity of smallholder agriculture, including off-farm income-generating



activities for women. Economic liberalization has allowed further development of such a strategy by enhancing the viability and productivity of investments by farm households. In particular, IFAD has paid attention to support farmer organizations that empower poor households to exploit the improved policy environment, including access to credit on commercial terms through service cooperatives and the development of farmer-owned and managed small-scale irrigation systems. This assistance has increasingly been provided in the context of a decentralized institutional framework, an approach that has involved support for local capacity-building and assistance to community-based, grass-roots organizations.

Ethiopia's Policy for Poverty Eradication

6. The main goal of the Government's development strategy is sustained poverty reduction to be achieved through a combination of sustainable economic growth, improvements in basic social services and specially targeted measures to improve household-farm incomes, self-reliance and the quality of life of the poorest groups and communities. The main thrust of the economic growth programme is to maintain macroeconomic stability by reducing the budget deficit, controlling inflation and keeping the exchange rate competitive and interest rates positive. The second policy initiative is to stimulate production through the strategy of Agricultural Development-Led Industrialization, which seeks expression in three areas: (a) improved small-holder productivity and extensive farming especially in the lowlands; (b) improved productivity in the industrial and service sectors; and (c) in production of minerals to diversify Ethiopia's exports. The third initiative is intended to encourage private-sector investment by streamlining procedures governing investment and trade, and liberalizing the financial sector. The fourth policy initiative entails improved infrastructure, services and natural resource use and management.

The Poverty Eradication Activities of other Major Donors

7. The large number of multilateral and bilateral aid agencies presently operating in Ethiopia have increasingly directed their development assistance towards sector-wide poverty reduction programmes consistent with the Government's development strategy. Within this framework of sectoral investment programmes, Ethiopia has been selected by both IFAD and the World Bank as a focus country for their joint collaborative strategy and programme development. The ARTP will complement the poverty-alleviation initiatives of the ongoing farmer-based seed multiplication and marketing programme under the Informal Seed Component cofinanced by IDA, and enhance the long-term viability of small-scale irrigation schemes being developed and rehabilitated under the Special Country Programme - Phase II in which IDA is the cooperating institution.

IFAD's Strategy in Ethiopia

8. As a sector-investment project, the ARTP presents IFAD with an important opportunity to influence the direction of policy and institutional reforms for the long-term benefit of the poorest segments of the majority smallholder farmers in Ethiopia. The efficient generation and adoption of ecologically sound crop and livestock-production technologies is clearly a long-term goal that calls for essential investments in capacity-building to arrest the continued decline in the productivity of smallholder agriculture and per capita food production. Capacity, however, must be accessible and responsive. Through the ARTP, IFAD will ensure that the needs and priorities of the poorest farm households living in marginal, arid and semi-arid agro-ecologies will henceforth be properly addressed by the expanded, decentralized and increasingly autonomous agricultural research and extension services. The ARTP will also be the mechanism to strengthen the responsiveness of the Ethiopian Agricultural Research System (EARS) to farmers' needs as end-users by improving the functional and institutional research-extension farmer linkages critical for enhancing the relevance of agricultural



research and its adoption by farmers. Lastly, the ARTP will, through the Agricultural Research Fund (ARF), introduce the flexibility required to ensure that the EARS will effectively address the diverse research needs of different stakeholders, especially resource-poor farmers, including women, who are outside the main body of commodity programmes.

Project Rationale

9. Ethiopia's major development objective is sustained poverty reduction through economic growth based on the Government's strategy of Agricultural Development-Led Industrialization. The ARTP will contribute to both economic growth and poverty reduction through increased productivity in the agricultural sector by ensuring the steady flow of improved crop and livestock technologies, which are more responsive to the needs and priorities of smallholder farmers with due attention to sustainable natural resource use and management. About 72% of the estimated 6 million smallholder farmers in Ethiopia have land holdings of 0.73 ha each, which is inadequate to produce enough food to meet the requirements for the average rural household of five on the basis of the existing subsistence-production technologies. The project will promote the efficient transfer of improved technologies and equally important make technology generation and transfer more participatory, demand-driven and relevant to smallholder farmers. The ARTP will rehabilitate and upgrade the research infrastructure and extend the research coverage to neglected, mostly drought-prone agro-ecological zones with a significant degradation of the natural resource base and a high concentration of especially poor and vulnerable households in the country. Many of these households have experienced displacement through civil war. The ARTP will support the Government's efforts to assist agro-ecological zones that are isolated and with inadequate physical and social infrastructure. Specifically they will aid in building the local capacity required to initiate and manage the agricultural research agenda relevant to their own specific natural resource base and farming systems and promoting the increased participation of farm households in the formulation and implementation of research programmes. Thus the project is expected to make a significant contribution to sustained poverty reduction, by facilitating sustainable intensification of agricultural production.

PART II - THE PROJECT

A. Project Area and Target Group

10. The principal beneficiaries of the ARTP as a national, long-term sector investment programme are primarily the estimated 6 million smallholder farmers, most with holdings of less than one hectare each; these peasants constitute an overwhelming majority (around 90%) of the farming population in Ethiopia. Women will benefit both as farmers and farmworkers from the generation of improved post-harvest and production technologies specifically aimed at improving efficiency and reducing drudgery in the farm operations in which they are involved. The project will also seek to raise the participation of women in the overall agricultural research effort through higher recruitment of women scientists and support staff in the system.

B. Objectives and Scope

11. The development objective of the project is to support sustained generation and adoption of ecologically sound technology for crop and livestock-production systems, which will also enhance natural resource use and management. The ARTP seeks to make EARS more efficient, productive and sustainable by: (a) building institutional capacity to manage efficiently the agricultural research system; (b) rationalizing the way research programmes are identified, designed and prioritized; (c) improving their relevance through decentralization, stakeholder consultation and establishment of strong research-extension farmer linkages; (d) drawing on the relevant pool of knowledge available internationally; (e) consolidating and strengthening existing research centres; (f) expanding research facilities, based



upon appropriate feasibility studies, into less favourable agro-ecological settings characterized by poverty and resource-poor farming systems; and (g) building human resource capacity in collaboration with the Alemaya University of Agriculture (AUA). The project will help create a conducive institutional environment, address gender issues and ensure that appropriate incentives are offered to researchers to attract and retain them in the research system.

C. Components

12. The project has three components: (a) agricultural research management; (b) strengthening of the agricultural research system; and (c) human resource development.

13. **Agricultural research management.** The component will support: (a) the establishment and development of an apex and autonomous Ethiopian agricultural research organization (EARO) created under a proclamation of Parliament dated 5 June 1997, to make agricultural research more efficient, cost-effective and relevant to the development needs of the country; (b) the design and implementation of a decentralized agricultural research system based upon a participatory and client-driven approach; (c) formulation and implementation of improved systems and operational procedures for coordinated and efficient agricultural research management; (d) the organization of the annual National Agricultural Research Workshop for all stakeholders to review past performance and the annual work plan and budget; (e) the development and implementation of effective, functional (farmer-research groups) and institutional (research-extension advisory councils) linkages between research and extension services and farmers as end-users to ensure efficient and rapid transfer and adoption of on-the-shelf and newly generated technology; (f) the establishment of an efficient information and documentation system for all research entities to ensure adequate linkages between research centres within the country and external research entities of excellence; (g) studies and measures geared to address gender-related issues in agricultural research; and (h) the establishment of an ARF to enhance the flexibility required by the research system to respond effectively to the needs and priorities of resource-poor farmers outside the main body of the commodity programmes, such as post-harvest storage and processing technologies, labour-saving farm implements and improved draught-animal power. The ARF will also be the springboard for mobilizing additional resources from the private sector for the long-term sustainability of agricultural research. In summary, the project will provide the following: USD 3.8 million to support the establishment and efficient functioning of EARO; USD 5.5 million for the modernization of the information and documentation network of the EARS; USD 5.0 million for strengthening research-extension farmer linkages; and USD 1.5 million for the establishment of an ARF to be administered following guidelines and selection criteria to be adopted by EARO with prior IDA and IFAD approval.

14. **Strengthening of the agricultural research system.** This component will rehabilitate, modernize and expand the existing agricultural research system and essential infrastructure in order to make its operation more efficient and the work environment more conducive to serious research work, even in inhospitable and remote locations. The project will: (a) rehabilitate and upgrade the research infrastructure at 18 existing centres at a cost of USD 27.6 million, including staff housing and essential facilities; (b) provide vehicles to improve staff mobility and farm equipment to improve the efficiency of operations; and (c) provide laboratory equipment, mostly to replace the worn out equipment, and necessary furniture. The project will also finance, on a declining basis, non-staff operating costs. In addition, the project will support a modest beginning in biotechnology research, including research on tissue culture and rhizobiology at a cost of USD 3.8 million. Collaborative linkages will also be established with specialized laboratories, and depending upon the availability of trained human resources, advanced biotechnology research will be initiated at one selected research centre. Similarly, biotechnology research in livestock will begin with animal breeding and genetics at one centre. EARO will make a detailed action plan for starting this programme and obtain IDA approval in each case. In order to support the overriding national objective of poverty reduction and



equity in regional development, the project will support, at an estimated cost of USD 15.6 million,
the setting up of six



research centres to develop technologies for the hitherto uncovered, marginal agro-ecological zones. Here live the poorest segments of the agricultural population, exposed to frequent and severe weather aberrations, including recurring droughts. These resource-poor farmers have had no access to any useful technologies so far. The setting up of these centres will be based on a careful and detailed feasibility study, in accordance with terms of reference acceptable to IDA and IFAD, in project year (PY) 1. The investment proposals will be subject to prior IDA and IFAD approval.

15. **Human resource development.** This component will strengthen the human resource base of the agricultural research system by providing technical assistance and training not only for the researchers in the agricultural research system, but also for the agricultural education system (essentially at AUA). Furthermore, the AUA will also be strengthened to improve its teaching and research facilities at the estimated cost of USD 8.8 million with a view to enhancing its capacity and increasing enrolment in undergraduate and postgraduate classes. Improving the skills of the academic staff will entail overseas higher education (Ph.D.s.) for 43 staff members and their effective replacement by expatriate professors for the duration of their absence abroad at an estimated cost of USD 9.5 million. In addition, the improvement of the skills of the research staff at various centres will include: overseas training for 83 staff members (71 Ph.D. and 12 M.Sc.); upgrading the educational qualifications of 501 scientific staff to a post graduate level; and in-service training programmes for research staff at an estimated cost of USD 9.5 million.

D. Costs and Financing

16. Total project costs are estimated at USD 90.6 million, including price and physical contingencies of USD 16.9 million. The foreign exchange cost is estimated at USD 48.7 million or 54% of total project costs. Physical contingencies amount to USD 10.5 or 14% of base costs. Price contingencies are estimated to be USD 6.4 million or 9% of base costs. Project costs by component are summarized in Table 1 below:

TABLE 1: SUMMARY OF PROJECT COSTS^a
(USD million)

Components	Local	Foreign	Total	% of Foreign Exchange	% of Base Costs
Agricultural research management	5.9	7.4	13.3	56	18
Strengthening of the agricultural research system	11.8	26.3	38.1	69	52
Human resource development	7.4	14.9	22.3	67	30
Total base costs	25.0	48.7	73.7	66	100
Physical contingencies	3.6	6.9	10.5	65	14
Price contingencies	2.7	3.7	6.4	58	9
Total project costs	31.4	59.2	90.6	65	123

^a Discrepancies in totals are due to rounding.

17. The proposed project will be financed by an IFAD loan of USD 18.2 million, an IDA credit of USD 60.0 million and a Government contribution of USD 12.4 million. The detailed financing plan by project component is shown in Table 2 below:



TABLE 2: FINANCING PLAN
(USD '000)

	Government		IDA		IFAD		Total		For. Exch.	Total (Excl. Taxes)	Duties and Taxes
	Amount	%	Amount	%	Amount	%	Amount	%			
A. Agricultural Research Management											
1. Improve management function EARO	589	15.6	3 87	84.4	-	-	3 776	4.2	2 582	951	244
2. Improve information and documentation system											
Strengthen EARO's info. and documentation unit	205	13.6	1 302	86.4	-	-	1 508	1.7	1 124	239	144
Ensure connectivity at RC level	757	18.9	3 255	81.1	-	-	4 012	4.4	2 377	1 285	350
Subtotal	963	17.4	4 557	82.6	-	-	5 520	6.1	3 501	1 524	495
3. Enhance the focus of agricultural research											
Ensure linkages with the extension services	941	20.1	-	-	3 733	79.9	4 674	5.2	1 252	3 074	348
Strengthen linkages with other organizations	-	-	381	100.0	-	-	381	0.4	381	-	-
ARF	150	10.0	-	-	1 350	90.0	1 500	1.7	900	600	-
Subtotal	1 091	16.6	381	5.8	5 083	77.5	6 555	7.2	2 533	3 674	348
Subtotal	2 643	16.7	8 125	51.3	5 083	32.1	15 851	17.5	8 616	6 149	1 086
B. Strengthening of the agricultural research system											
1. Strengthen the existing research centres	5 111	18.5	22 515	81.5	-	-	27 626	30.5	17 873	6 626	3 127
2. Expand network of research centres to new areas	2 537	16.2	-	-	13 075	83.8	15 612	17.2	11 626	2 518	1 468
3. Modernization of research techniques	725	19.0	3 095	81.0	-	-	3 819	4.2	2 684	638	498
Subtotal	8 372	17.8	25 610	54.4	13 075	27.8	47 057	51.9	32 182	9 782	5 093
C. Human Resource Development											
1. Strengthen the AUA graduate programme											
Improve teaching facilities	1 382	16.4	7 058	83.6	-	-	8 440	9.3	6 243	1 212	985
Improve skills of academic staff	-	-	9 487	100.0	-	-	9 487	10.5	9 487	-	-
Improve on-campus facilities	34	10.0	309	90.0	-	-	343	0.4	309	3	31
Subtotal	1 417	7.8	16 854	92.2	-	-	18 270	20.2	16 039	1 215	1 016
2. Improve skills of research staff											
Researchers at research centres	-	-	9 124	100.0	-	-	9 124	10.1	2 257	6 867	-
Research staff at other centres	-	-	339	100.0	-	-	339	0.4	176	163	-
Subtotal	-	-	9 463	100.0	-	-	9 463	10.4	2 433	7 030	-
Subtotal	1 417	5.1	26 317	94.9	-	-	27 733	30.6	18 472	8 245	1 016
Total disbursement	12 432	13.7	60 052	66.3	18 158	20.0	90 642	100.0	59 270	24 176	7 196

^a Discrepancies in totals are due to rounding.





E. Procurement, Disbursement, Accounts and Audit

18. **Procurement.** The procurement of goods and works will be carried out in accordance with IDA and IFAD guidelines. Goods will be procured following international competitive bidding, in respect of any contract estimated to cost the equivalent of USD 200 000 or more. Any contract below this threshold will be awarded following national competitive bidding procedures. However, any contract estimated to cost less than USD 50 000 equivalent may be awarded on the basis of international shopping or from the Inter-Agency Procurement Services Organization, local shopping or sole source for proprietary items. Civil works will be carried out following international competitive bidding for any one contract estimated to cost the equivalent of USD 500 000 or more. Any contract below this threshold will be awarded following national competitive bidding or local shopping procedures. Consulting and training services will be procured following the quality and cost-based selection method.

19. **Disbursement.** Proceeds of the IDA credit and IFAD loan will be disbursed over a period of six years. Disbursement for all expenditures will be made against full supporting documents, except for payments made under contract for goods (costing the equivalent USD 200 000 or less), civil works (costing the equivalent USD 500 000 or less) and services (costing the equivalent of USD 100 000 or less for consulting firms and the equivalent of USD 50 000 or less for individual consultants). These will be made on the basis of certified statements of expenditures. To improve the efficiency of loan disbursements and ensure sufficient cash liquidity critical for timely project implementation, a special account will be opened by the EARO at the Central Bank of Ethiopia (or a commercial bank) under terms and conditions satisfactory to IDA and IFAD. Upon effectiveness, a sum of USD 1.0 million will be deposited into the special account to finance IFAD's share of eligible expenditures for the project. The closing date of the loan is 31 March 2005.

20. **Accounts and audit.** EARO will be responsible for project financial accounting and management and reporting, consistent with internationally accepted accounting principles. The decentralized administration and management of research will be complemented by decentralized financial accounting and management. Accounting records will be kept for all project-related expenditures and audited annually following international auditing standards by the Audit Services Corporation or other independent auditors acceptable to IDA/IFAD. The audit reports in respect of project accounts will be furnished to IDA and IFAD within six months of the close of the fiscal year, including separate opinions on the special account and statements of expenditures.

F. Organization and Management

21. The EARO will be responsible for the overall implementation of the project. However, the responsibility for the actual implementation of various components and sub-components will rest with EARO, the research centres (RCs), including specialized institutes, and AUA. The RCs and AUA will receive funds from and be accountable to EARO in the implementation of project activities. To this effect, EARO will enter into memoranda of understanding with regional governments/regional research centres, the AUA and the Ministry of Agriculture with regard to enhanced linkages between research and extension services and farmers. These memoranda of understanding will be signed before effectiveness.

22. The EARO will: (a) define procedures for stakeholder consultation and collaboration; (b) prepare a five-year research-action plan; (c) approve the research programme of each RC as well as contract research in accordance with priorities and available fiscal and human resources; (d) ensure adequate linkages between various RCs and external research entities of excellence; (e) establish an efficient information and documentation system; (f) strengthen arrangements for the transfer of on-the-shelf and newly generated technology to the farmers, *inter alia*, by fostering strong research-extension farmer linkages at the RC level; (g) encourage greater participation of women in research and provide for gender sensitivity in the development and targeting of research programmes;



(h) ensure adherence of each implementing agency to the memoranda of understanding; (i) review the performance of each research programme in the outgoing year and the proposed work programme and budget for the next year, and share its findings with a wide community of stakeholders including extension staff, donors and NGOs, and (j) prepare an annual human resource development plan taking into account the availability of the critical mass of skilled staff needed to implement the research programmes. This plan will be cleared with IDA/IFAD prior to implementation. EARO will also prepare by 31 December 1998, an agricultural research strategy paper and share it with IDA/IFAD and other donors.

23. Each RC will be responsible for: (a) consulting and collaborating with the stakeholders and beneficiaries; (b) defining the research agenda and priorities in a participatory manner, based on a farming-systems approach; (c) annually preparing a detailed action plan, including staff and budget required for each research activity and upon approval, implementing it; (d) ensuring close linkages with extension agencies; (e) ensuring timely and efficient implementation of ARTP activities; (f) establishing and maintaining separate accounts related to ARTP activities; and (g) submitting quarterly reports and returns to EARO to help in project monitoring, supervision and evaluation. The AUA, as the principal provider of scientific human resources for EARS, will be the key implementing agency for the human resource development plan, as well as the strengthening of the infrastructure facilities at AUA. In addition, it will engage in agricultural research to support practical teaching and guidance to university students.

24. **Project coordination.** The overall coordination of ARTP will be the responsibility of the Director General (DG), EARO. Project coordination will be ensured at the federal level with the Prime Minister's office and concerned ministries through the Director General of EARO. However, at the RC level, client participation in programme review and planning will be ensured by establishing close linkages with extension agencies and other stakeholders. To strengthen inter-institutional coordination and cooperation, the Ministry of Agriculture, AUA and selected representatives of the regional governments will, in rotation, be nominated to the Ethiopian Agricultural Research Board. Established under Proclamation No. 79/1997 dated 5 June 1997, the board will guide, direct and supervise the EARO and through it be responsible for approving annual, medium and long-term research strategies and programmes. It will ensure effective coordination among all research entities and with other government agencies. The board has already been nominated by the Government and is presently functioning.

25. **Monitoring and evaluation (M&E).** The EARO, AUA, the Regional Agricultural Bureaux and the RCs will share responsibility for project M&E at their respective levels. Relevant data collection, validation, analysis, and dissemination will be the responsibility of the EARO. M&E will be guided by: (a) the Government's Letter of Sectoral Policy; (b) project design summary (logical framework) with monitorable indicators; and (c) the project implementation manual. M&E will be conducted through: (a) monthly progress review meetings chaired by the DG/EARO; (b) IDA supervision missions; (c) joint mid-term review of project with IDA/IFAD no later than 36 months after effectiveness; (d) base-line and subsequent annual beneficiary surveys to monitor trends in adoption rates; and (e) assessments by peer reviewers and by external reviewers, at least twice during the life of the project. At the RC or zonal and regional levels, the research and extension advisory councils will further strengthen the continuous M&E of the agricultural research system by the key stakeholders, including farmers as end-users. Twice each year, the EARO will transmit to IDA/IFAD progress reports on project implementation and outcomes, using the format agreed at the project launch workshop. An implementation completion report will be prepared within six months of the loan closing date.



G. Economic Justification

26. The economic net present value of the project is estimated at USD 39.4 million in constant 1997 prices, assuming a discount rate of 12%. The estimated economic rate of return (ERR) is 19%. The benefit-to-cost ratio of the project is 1.6 in economic terms and the switching values are 59% for costs and minus 73% for benefits, respectively. From an economic point of view, the project is robust, contributing about 2.5 million tonnes of total incremental production until project year 20 (peaking at 330 000 tonnes annually in the high potential areas and 26 000 tonnes annually in the low potential areas). Overall, the economic internal rate of return is conservative, considering that the benefits due from incremental livestock production have not been taken into account in the economic analysis. Further safeguards have been built-in to ensure that investments under the project will be viable and sustainable. First, the provision of housing and other social amenities, which are traditionally known to act as an incentive for scientists and others working in the research centres at remote locations, will be preceded by a careful needs assessment on a case-by-case basis. Second, the construction of new research centres under the project will be based on a careful analysis of their viability, size, scope and cost-effectiveness as well as the strategic choices available to EARO to service agriculturists in the hitherto uncovered ecologies. The terms of reference for such a study, to be conducted in project year 1, will be cleared with IDA/IFAD, and its findings and recommendations subject to prior review and approval by IDA/IFAD.

27. **Benefits.** The direct benefits of the project will include: a more efficient agricultural research system with institutions capable of cost-effectively addressing the priority problems of farmers in the diverse agro-ecologies of the country; the sustained production of improved and client-responsive technology; improved capacity for higher agricultural education and training of scientific personnel; a better trained and motivated cadre of agricultural researchers, with better opportunities for women; improved research-extension farmer linkages, and a more effective transfer of technologies. These benefits are expected to accelerate the generation of environmentally sound agricultural technologies for sustainable intensification of crop and livestock-production systems and natural resource use and management. This will provide stability and resilience to the agricultural sector to better cope with drought and famine situations, thereby increasing national and household food security and raising farmer incomes. At full maturity, the incremental annual production will be equivalent to about 360 000 tonnes of cereals.

28. **Beneficiaries.** First, the project will extend the coverage of agricultural research to resource-poor farmers in less favourable (drought and famine-prone) agro-ecological zones where nearly 20 million people constituting the poorest segments of the rural population live. Second, it will address the gender issue by: (a) paying specific attention to farming operations that are carried out by women; and (b) facilitate women's entry into the research system. A study will be carried out in PY 1 to identify the needs of women farmers as they relate to the development of crop and livestock-production technology. IDA supervision missions, in consultation with IFAD, will closely monitor the implementation of the agreed-upon recommendations. In the recruitment and training of scientists and technicians, the project will also support the Government's policy initiative to encourage women's entry into universities with a view to alleviating the existing imbalance in the male-to-female ratio.

H. Risks

29. First, the risk associated with delays in making EARO fully operational will be minimized by a time-bound action plan for the recruitment of key staff and the adoption of necessary operational manuals, which has already been agreed upon with the Government as a condition of effectiveness. In particular, the Director General of EARO has been appointed with the prior concurrence of IDA. Second, the risk that the autonomy and independence of EARO may be inadequate, leading to delays and discontinuities in research programmes, has significantly been reduced with the proclamation by parliament granting EARO powers to: recruit and remove staff; make intra-institutional budget



adjustments; contract out research; and introduce, modify and drop research programmes. Third, staff motivation and retention will be assured through the incentives structure for scientific staff which has now been put into place by the Government. Fourth, the risk that the proposed expansion of research programmes and centres may be constrained by inadequate fiscal and human resources will be addressed through planned feasibility studies to be carried out before expansion with the prior review and approval of the IDA and IFAD. The overall risk of the project is, therefore, considered to be moderate.

I. Environmental Impact

30. Farmers in Ethiopia are one of the major custodians of its natural resources. Facilitating the generation and adoption of ecologically sound and yield-enhancing crop and livestock-production technologies by farmers for sustainable use and management of these resources is one of the most important objectives of the project. The yield-enhancing technologies are intended to relieve pressure on marginal and degraded lands that are currently being brought under cultivation by subsistence farmers. Moreover, setting up the mechanisms to facilitate participatory on-farm and farming-systems research should help stabilize and improve farming in areas with degraded environments. By involving farmer and extension staff fully in the development and formulation of research programmes, it is anticipated that a more resource-sensitive and environmentally sustainable research agenda with emphasis on soil-moisture conservation and integrated-pest-management technology will be fostered. Furthermore, the project will include a review process that will screen out those research proposals with a potentially negative environmental impact. The overall environmental impact of the project is therefore expected to be positive.

J. Innovative Features

31. The establishment of the ARF is intended to introduce the flexibility required by the agricultural research system to respond effectively to the needs of resource-poor farmers and other stakeholders that are outside the main body of commodity research programmes. The ARF will also provide the mechanism through which additional financial resources will be mobilized from the private sector for long-term sustainability of agricultural research. Secondly, the project will promote the generation of improved post-harvest and production technologies aimed at enhancing the efficiency and reducing drudgery in those farm operations carried out women as farmers and farmworkers. Additionally, the project will seek to increase the participation of women in the agricultural research system through the preferred recruitment of women scientists and increased enrolment of female students into agricultural colleges and universities consistent with government policy. By improving the functional and institutional linkages between research, extension and farmers, the project will enhance the relevance and sustainability of agricultural research by ensuring that farmers as end-users play an increasingly greater role in defining its agenda, scope and direction.

PART III - LEGAL INSTRUMENTS AND AUTHORITY

32. A loan agreement between the Federal Democratic Republic of Ethiopia and IFAD constitutes the legal instrument for extending the proposed loan to the borrower. A summary of the important supplementary assurances included in the negotiated loan agreement is attached as an annex.

33. The Federal Democratic Republic of Ethiopia is empowered under its laws to borrow from IFAD.

34. I am satisfied that the proposed loan will comply with the Agreement Establishing IFAD.



PART IV - RECOMMENDATION

35. I recommend that the Executive Board approve the proposed loan in terms of the following resolution:

RESOLVED: that the Fund shall make a loan to the Federal Democratic Republic of Ethiopia in various currencies in an amount equivalent to thirteen million six hundred fifty thousand Special Drawing Rights (SDR 13 650 000) to mature on and prior to 15 July 2038 and to bear a service charge of three fourths of one per cent (0.75%) per annum, and to be upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented to the Executive Board in this Report and Recommendation of the President.

Fawzi H. Al-Sultan
President



SUMMARY OF IMPORTANT SUPPLEMENTARY ASSURANCES INCLUDED IN THE NEGOTIATED LOAN AGREEMENT

(Loan Negotiations concluded on 29 June 1998)

1. The Government of the Federal Democratic Republic of Ethiopia (the Government) shall open and maintain for the duration of project implementation, a Project Account in a commercial bank acceptable to IFAD and on terms and conditions satisfactory to IFAD. The Government shall deposit into the Project Account an initial amount equivalent to the Government's estimated share of counterpart funds required for project implementation during the first project year, as shall be agreed by the Government and IFAD at the beginning of the project year (the initial deposit); and thereafter, at annual intervals, deposit into the Project Account such amounts as shall be agreed between the Government and IFAD. The Government shall ensure the timely availability of its counterpart funds.
2. Not later than 31 March 1999, the Government shall cause EARO to adopt a human resource development plan, acceptable to IFAD, designed to improve the performance of its staff, including provision of incentives to retain qualified research staff.
3. The Government's right to make withdrawals from the loan may be suspended, should the following additional events occur:
 - (a) the IDA development credit has become, or risks becoming, liable for suspension or cancellation or becomes repayable prior to its agreed maturity date; and
 - (b) failure to perform any of the obligations under the following agreements: (i) the agreement between the Government, through its Ministry of Agriculture (MOA), and EARO for the purposes of carrying out the improved research-extension-farmer linkages sub-component of the agricultural research management component of the project; (ii) the agreements between EARO and the concerned regional governments for the purpose of carrying out the project; and (iii) the agreement between EARO and AUA for the purpose of carrying out a part of the human resource development component of the project.
4. The following are specified as additional events for the acceleration of maturity:
 - (a) IDA shall have accelerated the maturity of its credit; and
 - (b) the events specified in paragraph 3 above shall have taken place.
5. The following are specified as additional conditions to loan effectiveness:
 - (a) the Government shall have adopted a satisfactory project implementation manual;
 - (b) the agreements referred to in paragraph 3(b) above shall have been executed on behalf of the Government, EARO and the regional governments;
 - (c) EARO shall have adopted acceptable procedures for the decentralization of its research activities;



ANNEX I

- (d) the Government shall have (i) furnished an acceptable draft work programme and budget for the implementation of the project during the first project year, (ii) opened the Project Account, and (iii) made the initial deposit into the Project Account; and
 - (e) the positions of deputy general managers, project coordinator, and heads of procurement department and finance and accounting, respectively, of EARO, shall have been filled with persons with satisfactory qualifications and experience.
6. No withdrawals from the Loan Account shall be made in respect of expenditures for the:
 - (a) research grants sub-component of the agricultural research management component of the project, until EARO shall have formulated and adopted the guidelines establishing rules, procedures and eligibility criteria for the administration of ARF; and
 - (b) establishment and operation of six agricultural research centres sub-component of the agricultural research system component of the project, until such time as IFAD shall have approved the pre-investment viability study (least-cost approach) to be carried out by the Government to assess the best strategic option and ensure maximum cost effectiveness of investment in new research centres. The terms of reference, qualifications and experience of the consultants engaged by the Government for the purpose of this study shall be subject to the prior review of and approval by IFAD.
7. The Government shall ensure that the positions of director-general, deputy director-general, project coordinator, and directors of EARO will, at all times during the execution of the project, be kept filled by persons having qualifications and experience satisfactory to IFAD.
8. The Government shall take all measures necessary on its part to ensure that EARO, MOA and AUA are represented at the meetings of the Ethiopian Agricultural Research Board (EARB) at all times until the completion of the project.
9. Not later than 30 June 1999, the Government shall prepare, on the basis of the findings of the study on gender issues in relation to the development, transfer and adoption of improved agricultural production technologies, to be carried out under the agricultural research management component of the project, an action plan acceptable to IFAD, designed to increase the participation of women in agricultural research activities and to improve the relevance of agricultural research to the specific needs of women farmers, and thereafter implement said action plan in accordance with timetables indicated therein.
10. Not later than 30 June 1999, the Government shall cause EARO to adopt an action plan, acceptable to IFAD, for the establishment of the research centres to be established under the project, and thereafter, implement said action plan in accordance with the timetables indicated therein.
11. Not later than 30 September 1999, the Government shall cause EARO to adopt a five-year rolling agricultural research plan acceptable to IFAD, including appropriate human and budgetary requirements and timetables, and thereafter implement said plan in accordance with the timetables indicated therein.
12. Not later than 31 December 1999, the Government shall cause EARO to establish the ARF under terms of reference acceptable to IFAD.
13. EARO shall administer the ARF in accordance with the guidelines referred to in paragraph 6(a) above, including the following provisions:
 - (a) EARO shall have overall responsibility for the administration and control of the ARF and for the approval and disbursement of research grants; and



- (b) EARO shall enter into a research grant agreement with each ARF beneficiary under terms and conditions satisfactory to IFAD, which will include the obligation of the ARF beneficiary to:
- (i) carry out the research activity approved by EARO; (ii) report periodically to EARO on the progress made in carrying out the research; and (iii) procure the goods and services to be financed under the research grant in accordance with procedures acceptable to IFAD as specified in the research grant agreement and which shall be consistent with the procurement procedures specified in the loan agreement.



COUNTRY DATA

ETHIOPIA

Land area (km² thousand) 1994 1/	1 000	GNP per capita (USD) 1996 4/	110
Population (million) mid-1996 4/	58	Average annual real rate of growth of GNP per capita, 1985-95 2/	-0.5
Population density (population per km²) 1995 1/	56	Average annual rate of inflation, 1985-95 2/	5.9
Local currency	Ethiopian Birr	Exchange rate: USD 1 = ETB 6.73 (ETB)	
Social Indicators		Economic Indicators	
Population (average annual rate of growth) 1980-96 4/	2.1	GDP (USD million) 1996 4/	6 100
Crude birth rate (per thousand people) 1995 1/	47	Average annual rate of growth of GDP 1/ 1980-90	2.3
Crude death rate (per thousand people) 1995 1/	17	1990-95	n.a.
Infant mortality rate (per thousand live births) 1995 1/	112	Sectoral distribution of GDP, 1995 1/	
Life expectancy at birth (years) 1994 3/	48.2	% agriculture	57
Number of rural poor (million) 1/	n.a.	% industry	10
Poor as % of total rural population 1/	n.a.	% manufacturing	3
Total labour force (million) 1995 1/	25	% services	33
Female labour force as % of total, 1995 1/	41	Consumption, 1996 4/	
Education		Government consumption (as % of GDP)	11
Primary school enrolment (% of age group total) 1993 1/	23	Private consumption (as % of GDP)	81
Adult literacy rate (% of total population) 1994 3/	34.5	Gross domestic savings (as % of GDP)	8
Nutrition		Balance of Payments (USD million)	
Daily calorie supply per capita, 1992 3/	1 610	Merchandise exports, 1996 4/	410
Index of daily calorie supply per capita (industrial countries=100) 1992 3/	52	Merchandise imports, 1996 4/	1 413
Prevalence of child malnutrition (% of children under 5) 1989-95 1/	47	Balance of trade	-1 003
Health		Current account balances (USD million)	
People per physician, 1993 1/	32 499	before official transfers, 1996 4/	- 460
People per nurse, 1993 1/	13 628	after official transfers, 1996 4/	- 15
Access to safe water (% of population) 1990-96 3/	25	Foreign direct investment, 1995 1/	7
Access to health service (% of population) 1990-95 3/	46	Net workers' remittances, 1995 1/	312
Access to sanitation (% of population) 1990-96 3/	19	Income terms of trade (1987=100) 1996 4/	58
Agriculture and Food		Government Finance	
Cereal imports (thousands of metric tonnes) 1994 1/	928	Overall budget surplus/deficit (as % of GDP) 1996 4/	-8.3
Food imports as % of total merchandise imports 1993 1/	6	Total expenditure (% of GDP) 1994 1/	27.4
Fertilizer consumption (hundred grams of plant nutrient per arable ha) 1994/95 1/	42	Total external debt (USD million) 1995 1/	5 221
Food production index (1989-91=100) 1995 1/	n.a.	Total external debt (as % of GNP) 1995 1/	65.7
Food aid in cereals (thousands of metric tonnes) 1994-95 1/	720	Total debt service (% of exports of goods and services) 1996 4/	33.7
Land Use		Nominal lending rate of banks, 1995 1/	15.1
Agricultural land as % of total land area, 1994 1/	31	Nominal deposit rate of banks, 1995 1/	11.5
Forest and woodland area (km ² thousand) 1990 1/	142		
Forest and woodland area as % of total land area, 1990 1/	14		
Irrigated land as % of arable land, 1994 1/	1.7		

n.a. not available.

Figures in italics indicate data that are for years or periods other than those specified

1/ World Bank, *World Development Report*, 19972/ World Bank, *Atlas*, 19973/ United Nations Development Programme, *Human Development Report*, 1997

4/ Preliminary World Bank Estimates

PREVIOUS IFAD LOANS IN ETHIOPIA

Project Name	Initiating Institution	Cooperating Institution	Lending Terms	Board Approval	Loan Effectiveness	Current Closing Date	Loan/Grant Acronym	Currency	Approved Loan/Grant Amount	Disbursement (as % of approved amount)
Second Agricultural Minimum Package Project	World Bank: IDA	World Bank: IDA	HC	07 May 80	23 Apr 81	31 Dec 85	L - I - 40 - ET	SDR	13.90	97.9%
Agricultural Credit Project	IFAD	World Bank: IDA	HC	12 Sep 83	11 Apr 84	31 Mar 91	L - I - 131 - ET	SDR	10.45	99.7%
Rehabilitation Programme for Drought Affected Areas	IFAD	UNOPS	HC	02 Apr 85	21 Jun 85	31 Dec 90	L - I - 168 - ET	SDR	13.05	97.8%
Fourth Livestock Development Project	World Bank: IDA	World Bank: IDA	HC	09 Sep 87	09 Feb 88	31 Dec 92	L - I - 205 - ET	SDR	4.50	98.6%
Southern Region Cooperatives Development and Credit Project	IFAD	UNOPS	HC	02 Dec 93	17 Aug 94	06 Jul 01	G - S - 36 - ET	USD	0.23	97.1%
Southern Region Cooperatives Development and Credit Project	IFAD	UNOPS	HC	02 Dec 93	17 Aug 94	06 Jul 01	L - I - 342 - ET	SDR	7.55	30.6%
Southern Region Cooperatives Development and Credit Project	IFAD	UNOPS	HC	02 Dec 93	17 Aug 94	06 Jul 01	L - S - 37 - ET	SDR	5.05	13.4%
Special Country Programme	IFAD	World Bank: IDA	HC	03 Dec 86	13 Oct 87	31 Dec 96	G - S - 2 - ET	USD	0.52	99.3%
Special Country Programme	IFAD	World Bank: IDA	HC	03 Dec 86	13 Oct 87	31 Dec 96	L - S - 3 - ET	SDR	9.30	47.0%
Informal Seed Component of the Seed Systems Development Project	World Bank: IDA	World Bank: IDA	HC	11 Sep 96	21 Mar 97	30 Jun 01	L - I - 421 - ET	SDR	4.60	08.0%
Special Country Programme - Phase II	IFAD	World Bank: IDA	HC	05 Dec 96		31 Dec 03	G - I - 36 - NE	USD	30.00	84.2%
Special Country Programme - Phase II	IFAD	World Bank: IDA	HC	05 Dec 96		31 Dec 03	G - I - 40 - ET	USD	90.00	
Special Country Programme - Phase II	IFAD	World Bank: IDA	HC	05 Dec 96		31 Dec 03	L - I - 438 - ET	SDR	15.65	

Note: HC= highly concessional





SUMMARY OF PROJECT DESCRIPTION

A. Objectives

1. The development objective of the project is to support sustained generation and enhancement of ecologically sound technology for crop and livestock-production systems and natural resource management by improving the efficiency and effectiveness of the EARS, strengthening its infrastructure and human resource capacity and making the system more responsive to farmers' needs and priorities.

B. Components

2. **Agricultural Research Management.** This component will: (i) make EARO functional with adequate institutional capacity for the efficient management and coordination of agricultural research; (ii) develop and introduce a decentralized system for prioritization of agricultural research, in consultation with stakeholders and according to acceptable economic criteria; (iii) improve the effectiveness of research by strengthening research-extension farmer linkages; (iv) improve the exchange of research information by strengthening the agricultural research data base, information and documentation system; (v) strengthen links with international research organizations; (vi) ensure timely and adequate budgetary support to approved research programmes; (vii) introduce and maintain an incentive structure for research staff; (viii) address gender issues; and (ix) establish and operate the ARF.

3. **Strengthening of the Agricultural Research System.** This component will: (i) strengthen the network of existing research centres through rehabilitation of essential facilities and provision of necessary mobility and logistical support; (ii) introduce biotechnology research; (iii) provide new research facilities to the hitherto uncovered and harsh agro-ecologies characterized by extreme poverty; and (iv) provide incremental operating and maintenance support at research centres.

4. **Human Resource Development.** This component will facilitate the availability of higher quality and increased number of research personnel through: (i) strengthening of AUA's teaching facilities, improving the skills of academic staff; and (ii) improving skills of research staff through overseas and local training.

C. Benefits

5. The direct benefits of the project will include: a more efficient agricultural research system capable of cost effectively addressing the priority problems of farmers in diverse agro-ecologies; the sustained production of improved and client-responsive technology; improved capacity for higher agricultural education and training of scientific personnel; and a better trained and motivated cadre of agricultural researchers, including better opportunities for women. The accelerated generation of environmentally sound technologies for crop and livestock-production systems and natural resource management will provide stability and resilience to the agricultural sector to better cope with drought and famine situations, thereby improving household-food security and farmers' incomes. At full maturity, the incremental annual production will amount to about 360 000 tonnes of cereals. Total incremental cereal production will, by project year 20, add up to some 2.5 million tonnes.



APPENDIX III

6. The **beneficiary** population will be the estimated 6 million smallholder farmers, mostly with holdings of less than one hectare each who constitute an overwhelming majority of the farming population. Women farmers and farmworkers will also benefit from the generation of improved post-harvest and production technologies specifically aimed at improving efficiency and reducing drudgery in those farm operations handled by them. The project will also seek to raise the participation of women in the overall agricultural research effort through higher recruitment of women scientists and the increased enrolment of female students in agricultural colleges and universities consistent with recent Government policy. Furthermore, participation of women in the research and extension advisory councils and farmer research groups will give them an added opportunity to influence the formulation and prioritization of research programmes.



LOGICAL FRAMEWORK

Narrative Summary	Key Performance Indicators	Monitoring & Supervision	Critical Assumptions & Risks
<p>CAS /Sector Related Goal: 1. Sustainable and ecologically sound growth in the agricultural sector accelerated.</p>	<p>1. Increase in production and yield in crop and livestock and increase in the number of small farmers using new technology.</p>	<p>1.1.1 Annual agricultural survey by the Central Statistical Authority (CSA) 1.1.2 Annual crop production and assessment surveys by the FAO-World Food Programme 1.1.3 Baseline survey and subsequent annual surveys of programme effectiveness by EARO 1.1.4 Mid-term review (MTR) and implementation completion report (ICR)</p>	
<p>Project Development Objectives: 2. Practical, responsive and ecologically sound technologies for small-holder crop and livestock-production systems identified and transferred to extension.</p>	<p>2.1 Accelerated identification, testing, release and transfer to the extension services of improved technologies in crop and livestock production and natural resource management; 2.2 Number of new research initiatives based on collaborative process started annually.</p>	<p>2.1.1 EARO semi-annual reports 2.1.2 Supervision reports 2.2.1 MTRs and implementation completion report (ICR)</p>	<p>(a) normal rainfall; (b) stable political situation; (c) conducive macro-economic environment, including pricing of agricultural produce and inputs; (d) continued availability of complementary agricultural support services, including extension and credit; (e) new technology adapted by larger number of farmers; (f) qualified research staff will be in position.</p>
<p>Outputs: 1. EARO management and coordination system made operational</p>	<p>1.1 Autonomous apex organization established to guide and coordinate overall national research system, staffed and operational by Sept. 1998;</p>	<p>1.1.1 EARO report by end Sept. 1998 1.1.2 Supervision reports 1.1.3 EARO's semi-annual reports</p>	<p>(a) EARO granted autonomous status; (b) AUA and RRCs remain fully responsive to EARO and project goals; (c) incentives system designed, developed and implemented for the research system by Sept. 1998; and (d) EARO does not suffer staff or budget shortages.</p>



APPENDIX IV

	Verifiable Indicators	Monitoring & Supervision	Assumptions & Risks
	<p>1.2 ARTP coordination unit for donor-assisted projects established and operational by June 30, 1998</p> <p>1.3 EARO implements policy, formulates strategy, defines participatory processes, approves prioritized research, allocates budgets, and periodically monitors, evaluates and reports on research programmes, promotes domestic and international linkages and workshops</p> <p>1.4 Consolidated annual ARTP workplan, procurement plan and training plan prepared by EARO three months prior to the beginning of each fiscal year and cleared with IDA</p> <p>1.5 Information and documentation unit (publications, library, research data base) established, staffed, equipped and operational by Dec. 1999</p> <p>1.6 Draft manuals for financial, accounting, budgetary, project implementation, procurement and research planning and prioritization procedures finalized and adopted by Sept. 1998, and staff at research centres trained</p> <p>1.7 ARF established</p>	<p>1.2.1 EARO report before Sept. 1998</p> <p>1.2.2 Supervision reports</p> <p>1.2.2 EARO's semi-annual reports</p> <p>1.3.1 Supervision reports</p> <p>1.3.2 EARO's semi-annual reports</p> <p>1.4.1 Annual workplan</p> <p>1.4.2 Annual procurement plan</p> <p>1.4.3 Annual training plan</p> <p>1.5.1 Supervision reports</p> <p>1.5.2 EARO's semi-annual reports</p> <p>1.6.1 Submission of finalized manuals by EARO to IDA by Sept. 1998</p> <p>1.6.2 Training workshops completed by Dec. 1998</p> <p>1.7.1 Supervision report</p> <p>1.7.2 EARO's semi-annual report</p>	
2 Integrated information technology system implemented and operational	<p>2.1 Fully integrated information technology system, including hardware/software platforms, Internet and database access, deployed in EARO headquarters, AUA and all centres by Dec. 1999</p> <p>2.2 Concerned researchers and other users at EARO headquarters, AUA and all centres trained in information system operation by Dec. 1999</p> <p>2.3 Management Information system (MIS) for all centres, AUA and EARO headquarters established and operational by Dec. 1999</p>	<p>2.1.1 Supervision reports</p> <p>2.1.2 EARO's semi-annual reports</p> <p>2.2.1 Supervision reports</p> <p>2.2.2 EARO's semi-annual reports</p> <p>2.3.1 Supervision reports</p> <p>2.3.2 EARO's semi-annual reports</p>	<p>(a) Necessary studies are completed on time</p> <p>(b) Suitable staff are available for training</p>



Output	Verifiable Indicators	Monitoring & Supervision	Assumptions & Risks
<p>3. Quality and responsiveness of research programmes improved</p>	<p>3.1 Client-centred, demand-driven collaborative process for identifying, prioritizing, implementing and evaluating research programmes established and managed at research centre level by Dec. 1998</p> <p>3.2 Authority delegated to the research centres for technical and financial control over research programmes by Sept. 1998</p> <p>3.3 Performance-based system for annual funding and review of approved research programmes established at federal and research centres by Sept. 1998</p> <p>3.4 Research centres and external research institutions linkages established for exchange of information, staff and collaborative/contract research</p> <p>3.5 Biotechnology research initiated at selected research centres</p>	<p>3.1.1 EARO semi-annual report's</p> <p>3.1.2 supervision reports; and</p> <p>3.1.3 annual beneficiary assessment surveys</p> <p>3.2.1 Letter delegating authority to the research centres</p> <p>3.2.2. Supervision reports</p> <p>3.3.1 EARO semi-annual report</p> <p>3.3.2 Supervision reports.</p> <p>3.4.1 EARO semi-annual report</p> <p>3.4.2 Supervision reports</p> <p>3.5.1 EARO semi-annual report</p> <p>3.5.2 Supervision reports</p>	<p>(a) effective implementation of procedures for prioritizing research through client consultative approach;</p> <p>(b) incentive system for researchers in place and operational; and</p> <p>c) adequate counterpart funds provided by Government on-time.</p>
<p>4. Network of existing research centres rehabilitated and strengthened</p>	<p>4.1 Upgrade existing centres (physical quantities) by Dec. 2002</p> <p>4.2 Replacement and new laboratory/farm/office equipment (see project files list); incremental recurrent costs provided</p> <p>4.3 Vehicles include. buses and motorcycles procured and deployed</p>	<p>4.1.1 EARO semi-annual report</p> <p>4.1.2 Supervision reports</p> <p>4.2.1 EARO semi-annual report</p> <p>4.2.2 Supervision reports</p> <p>4.3.1 EARO semi-annual report</p> <p>4.3.2 Supervision reports</p>	<p>(a) adequate counterpart funds provided by the Government on-time; and</p> <p>(b) adequate number of staff deployed at the research centres.</p>



INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT

APPENDIX IV

Output	Verifiable Indicators	Monitoring & Supervision	Assumptions & Risks
5. New centres established in uncovered agro-ecological zones	5.1 New research centres constructed, equipped, staffed and operational by 2003	5.1.1 EARO semi-annual report 5.1.2 Supervision reports	(a) feasibility studies for the centres fully justify the investment; and (b) adequate scientific staff is available to run the research centres.
6. Biotechnology research strengthened	6.1 Additional laboratory facilities at selected research centres built, and biotechnology specific equipment installed, and made operational by Dec. 2000	6.1.1 EARO semi-annual report 6.1.2 Supervision reports	Adequate scientific staff is available to run the research centres.
7. Research-extension farmer linkages established and operational	7.1 Research-extension farmer coordination mechanism established at the federal, regional and research centre level for getting farmer feed-back on research priority needs and for disseminating research finding 7.2 Alternative approaches to research, extension and farmer linkages piloted in selected areas in 1998/99 through e.g. mass media, farm trials, field-farm days, diagnostic surveys, extension training at research centres and successful approaches replicated beginning Jan. 1999	7.1.1 EARO semi-annual report 7.1.2 Supervision reports 7.1.3 Annual beneficiary assessment survey. 7.2.1 EARO semi-annual report 7.2.2 Supervision reports 7.2.3 Annual beneficiary assessment survey in pilot areas	(a) active participation of extension services staff and farmers in the formulation, prioritization, implementation and review of research programmes; (b) effective extension service in place and operational; (c) commitment of extension services to participatory approaches to technology, development and transfer; and (d) commitment of regional governments and EARO to implement effectively the proposed linkage mechanisms.
8. Strengthened AUA	8.1 Improved skills of academic teaching staff at AUA by allowing for their overseas Ph.D. training, while their teaching duties were covered during their absence by especially recruited professors/assistant professors under a technical assistance arrangements	8.1.1 EARO semi-annual report 8.1.2 Supervision reports	(a) adequate number of persons identified; (b) adequate number of professors/assistant professors recruited internationally; and (c) adequate counterpart funds provided by the Government on-time.
	8.2 Built additional office, laboratory, library, class room, and computer centre facilities to improve the educational infrastructure and provided funding for associated incremental recurrent costs	8.2.1 EARO semi-annual report 8.2.2 Supervision reports	
	8.3 Supplied office and laboratory equipment, furniture, textbooks and journals, as well as limited farm equipment, vehicles and funding to cover associated incremental recurrent costs	8.4.1 EARO semi-annual report 8.4.2 Supervision reports	



Output	Verifiable Indicators	Monitoring & Supervision	Assumptions & Risks
	8.4 Expanded the on-campus facilities by building and equipping, <i>inter alia</i> , a health clinic, kindergarten and px-store, to make campus life more attractive and retain teaching staff, and provided associated incremental recurrent costs	8.4.1 EARO semi-annual report; 8.4.2 Supervision reports.	
9. Improved Skills of Research Staff	9.1 Completed, in a coordinated manner, a gender-sensitive training programme commensurate to the project investment activities -- including overseas Ph.D. and local M.Sc. and on- the-job training -- to improve the skills of research staff in existing and new research centres , as well as in the selected sectoral research institutes	9.1.1 EARO semi-annual report 9.1.2 Supervision reports	Adequate number of male and female research staff available, without seriously affecting on-going research programmes.
Components/Activities	Inputs		
1 : Agricultural Research Management	15.8	1. Progress reports and disbursement reports	
a. Improve the management function of EARO	3.8		
b. Improve the info. & documentation system	5.5		
- strengthen the info. & documentation unit	1.5		
- ensure connectivity at research centre level	4.0		
c. Enhance focus of agricultural research	6.5		
- ensure linkages with the extension farmers	4.6		
- strengthen linkages other organizations	0.4		
- agricultural research fund	1.5		
2.. Improve the Agricultural Research System	47.1	2. Progress reports and disbursement reports	
a. Strengthen the existing research centres	27.6		
b. Expand network to unserved agroecologies	15.6		
c. Modernize research technology	3.9		
3. Human Resource Development	27.7	3. Progress reports and disbursement reports	
a. Strengthen ARF	18.3		
- improve teaching facilities	8.4		
- improve skills of academic staff	9.5		
- improve on-campus facilities	0.4		
b. Improve skills of research staff	9.5		
- researchers at research centre	9.1		
- other research staff	0.4		
Grand Total	90.6		

PROJECT COST AND FINANCING

Table 1 - Component Project Cost Summary

	ETB '000					USD '000				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
A. Improve Agricultural Research Management										
1. Improve Management Function EARO	6 302	15 217	21 519	71	4	969	2 341	3 311	71	4
2. Improve Information & Documentation System										
Strengthen EARO's Info. & Documentation Unit	1 995	6 045	8 040	75	2	307	930	1 237	75	2
Ensure Connectivity at Research Centre Level/a	8 376	12 549	20 926	60	4	1 289	1 931	3 219	60	4
Subtotal Improve Information & Documentation System	10 371	18 595	28 966	64	6	1 596	2 861	4 456	64	6
3. Enhance the Focus of Agricultural Research										
Ensure Linkages with the Extension Services/b	17 782	6 637	24 418	27	5	2 736	1 021	3 757	27	5
Strengthen Linkages with Other Organizations/c	-	1 974	1 974	100	-	-	304	304	100	-
ARF	3 900	5 850	9 750	60	2	600	900	1 500	60	2
Subtotal Enhance the focus of Agricultural Research	21 682	14 461	36 142	40	8	3 336	2 225	5 560	40	8
Subtotal Improve Agricultural Research Management	38 355	48 273	86 627	56	18	5 901	7 427	13 327	56	18
B. Improve Network Agricultural Research Centres										
1. Strengthen the Existing Research Centres/d	50 422	95 280	145 703	65	30	7 757	14 659	22 416	65	30
2. Expand Network of Research Centres to New Areas/e	20 369	61 708	82 076	75	17	3 134	9 493	12 627	75	17
3. Modernization of Research Techniques/f	5 830	14 107	19 938	71	4	897	2 170	3 067	71	4
Subtotal Improve Network Agricultural Research Centres	76 622	171 095	247 717	69	52	11 788	26 322	38 110	69	52
C. Develop Agricultural Research Human Resources										
1. Strengthen the AUA Graduate Programme										
Improve Teaching Facilities	11 335	32 930	44 265	74	9	1 744	5 066	6 810	74	9
Improve Skills Academic Staff	-	49 516	49 516	100	10	-	7 618	7 618	100	10
Improve On-campus Facilities	181	1 629	1 810	90	-	28	251	278	90	-
Subtotal Strengthen the AUA Graduate Programme	11 516	84 075	95 591	88	20	1 772	12 935	14 706	88	20
2. Improve Skills of Research Staff										
Researchers at Research Centres	35 486	11 945	47 431	25	10	5 459	1 838	7 297	25	10
Research Staff at Other Centres/g	842	921	1 764	52	-	130	142	271	52	-
Subtotal Improve Skills of Research Staff	36 329	12 866	49 195	26	10	5 589	1 979	7 568	26	10
Subtotal Develop Agricultural Research Human Resources	47 845	96 941	144 786	67	30	7 361	14 914	22 275	67	30
Total Baseline Costs	162 821	316 309	479 130	66	100	25 049	48 663	73 712	66	100
Physical Contingencies	23 722	44 593	68 315	65	14	3 650	6 860	10 510	65	14
Price Contingencies	22 043	26 887	48 929	55	10	2 673	3 747	6 420	58	9
Total Project Costs	208 586	387 789	596 375	65	124	31 372	59 270	90 642	65	123

^a Including connectivity of AUA.

^b At federal, regional and zonal level.

^c domestic/international research organizations/institutes.

^d Rehabilitation of existing centres as well as selected sectoral research institutes/institutions.

^e New Areas intended as agro-ecological zones hitherto uncovered by the research centre network.

^f Modernization by strengthening/expanding and introduction of biotechnology.

^g National Soil Services Laboratories (NSSL), Forestry Research Centre (FRC), Animal Health Research Centre (AHRC), Wood Utilization Research Laboratory, Holetta Bee Centre



Table 2: Expenditure Accounts Project Summary

	ETB '000					USD '000				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
I. Investment Costs										
A. Works										
1. New Construction										
Housing /a	4 478	40 301	44 779	90	9	689	6 200	6 889	90	9
Offices	1 595	14 355	15 950	90	3	245	2 208	2 454	90	3
Storage	863	7 766	8 629	90	2	133	1 195	1 328	90	2
Laboratory	1 809	16 277	18 086	90	4	278	2 504	2 782	90	4
Libraries	956	8 600	9 556	90	2	147	1 323	1 470	90	2
Others	1 326	11 937	13 263	90	3	204	1 836	2 040	90	3
Social Areas /b	234	2 104	2 337	90	-	36	324	360	90	-
Subtotal New Construction	11 260	101 341	112 601	90	24	1 732	15 591	17 323	90	24
2. Rehabilitation										
Offices	650	975	1 625	60	-	100	150	250	60	-
3. Existing Buildings										
Storage	116	-	116	-	-	18	-	18	-	-
Subtotal Works	12 026	102 316	114 342	86	24	1 850	15 741	17 591	89	24
B. Goods										
1. Transport Equipment										
Land	6 369	31 847	38 216	83	8	980	4 899	5 879	83	8
2. Other Equipment										
Office	613	3 065	3 679	83	1	94	472	566	83	1
Furniture /c	1 330	6 652	7 983	83	2	205	1 023	1 228	83	2
Laboratory	9 622	48 112	57 734	83	12	1 480	7 402	8 882	83	12
Information & Documentation	2 034	10 170	12 204	83	3	313	1 565	1 878	83	3
Subtotal Other Equipment	13 600	68 000	81 600	83	17	2 092	10 462	12 554	83	17
3. Other Goods										
Research-Extension Linkage	17	87	104	83	-	3	13	16	83	-
Farm Equipment	-	9 360	9 360	100	2	-	1 440	1 440	100	2
Text Books & Journals	-	12 603	12 603	100	3	-	1 939	1 939	100	3
Subtotal Other Goods	17	22 050	22 067	100	5	3	3 392	3 395	100	5
Subtotal Goods	19 987	121 896	141 883	86	30	3 075	18 753	21 828	86	30
C. Technical Assistance										
1. Consultancies										
Short term	-	10 641	10 641	100	2	-	1 637	1 637	100	2
Long term	-	42 204	42 204	100	9	-	6 493	6 493	100	9
Long-term design & supervision	-	4 165	4 165	100	1	-	641	641	100	1
Long-term bid docs. prep.	-	5 200	5 200	100	1	-	800	800	100	1
Subtotal Consultancies	-	62 210	62 210	100	13	-	9 571	9 571	100	13
2. Studies										
Management	-	326	326	100	-	-	52	52	100	-
Others	-	4 304	4 304	100	1	-	662	662	100	1
Subtotal Studies	-	4 640	4 640	100	1	-	714	714	100	1





	ETB '000					USD '000				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
3. Assistance from other Institutions										
Visiting Scientists	-	1 974	1 974	100	-	-	304	304	100	-
Subtotal Technical Assistance	-	68 824	68 824	100	14	-	10 588	10 588	100	14
D. Training										
1. Overseas Courses										
Short term	-	494	494	100	-	-	76	76	100	-
Long term	-	20 830	20 830	100	4	-	3 205	3 205	100	4
Sub total Overseas Courses	-	21 323	21 323	100	4	-	3 281	3 281	100	4
2. Local Courses										
Short term	4 120	-	4 120	-	1	634	-	634	-	1
Long term	29 675	-	29 675	-	6	4 565	-	4 565	-	6
Subtotal Local Courses	33 795	-	33 795	-	7	5 199	-	5 199	-	7
3. Others										
Workshops	1 540	-	1 540	-	-	237	-	237	-	-
Study tours	2 830	1 950	4 780	41	1	435	300	735	41	1
Others	1 645	-	1 645	-	-	253	-	253	-	-
Subtotal Others	6 015	1 950	7 965	24	2	925	300	1 225	24	2
Subtotal Training	39 810	23 273	63 083	37	13	6 125	3 581	9 705	37	13
Total Investment Costs	71 823	316 309	388 132	81	81	11 050	48 663	59 713	81	81
II. Recurrent Costs										
A. Salaries and Wages										
2. Incremental										
Managerial	104	-	104	-	-	16	-	16	-	-
Technical	2 197	-	2 197	-	-	338	-	338	-	-
Support	824	-	824	-	-	127	-	127	-	-
Subtotal Incremental	3 126	-	3 126	-	1	481	-	481	-	1
C. Incentives										
1. Researchers	3 900	-	3 900	-	1	600	-	600	-	1
D. Maintenance										
1. Works										
Rehabilitation	90	-	90	-	-	14	-	14	-	-
Incremental	4 755	-	4 755	-	1	732	-	732	-	1
Subtotal Works	4 846	-	4 846	-	1	745	-	745	-	1
2. Goods										
a. Transport Equipment	34 276	-	34 276	-	7	5 273	-	5 273	-	7
b. Other Equipment	25 465	-	25 465	-	5	3 918	-	3 918	-	5
c. Other Goods	19 386	-	19 386	-	4	2 983	-	2 983	-	4
Subtotal Goods	79 127	-	79 127	-	17	12 173	-	12 173	-	17
Subtotal Maintenance	83 973	-	83 973	-	18	12 919	-	12 919	-	18
Total Recurrent Costs	90 999	-	90 999	-	19	14 000	-	14 000	-	19
Total Baseline Costs	162 821	316 309	479 130	66	100	25 049	48 663	73 712	66	100
Physical Contingencies	23 722	44 593	68 315	65	14	3 650	6 860	10 510	65	14
Price Contingencies	22 043	26 887	48 929	55	10	2 673	3 747	6 420	58	9
Total Project Costs	208 586	387 789	596 375	65	124	31 372	59 270	90 642	65	123

\a New and rehabilitated housing and social areas can also be considered as social infrastructure that is improved under the project. \

\b Social centres and meeting halls.

\c For housing and social areas.

Table 3 - Expenditure Accounts by Financiers
(USD '000)

	Government		IDA		IFAD		TOTAL		For. Exch.	Local (Excl. Taxes)	Duties and Taxes
	Amount	%	Amount	%	Amount	%	Amount	%			
A. Works											
New Construction	2 134	10.0	11 588	54.3	7 620	35.7	21 342	23.5	19 208	194	1 940
Rehabilitation	100	40.0	150	60.0	-	-	250	0.3	150	100	-
Existing buildings ²	19	100.0	-	-	-	-	19	-	-	17	2
Subtotal Works	2 253	10.4	11 738	54.3	7 620	35.3	21 611	23.8	19 358	311	1 942
B. Goods											
Transportation equipment	1 187	16.7	4 816	67.6	1 118	15.7	7 122	7.9	5 935	-	1 187
Other equipment	2 570	15.1	12 365	72.7	2 077	12.2	17 012	18.8	14 441	-	2 570
Other goods	3	0.1	1 878	74.7	633	25.2	2 514	2.8	2 511	-	3
Subtotal Goods	3 760	14.1	19 059	71.5	3 828	14.4	26 647	29.4	22 887	-	3 760
C. Technical Assistance											
1. Consultancies											
Short-term	-	-	836	48.2	900	51.8	1 736	1.9	1 736	-	-
Long-term	-	-	8 945	100.0	-	-	8 945	9.9	8 945	-	-
Long-term design & spn	-	-	481	61.0	308	39.0	789	0.9	789	-	-
Subtotal Consultancies	-	-	10 262	89.5	1 208	10.5	11 470	12.7	11 470	-	-
2. Studies	-	-	62	7.1	822	92.9	885	1.0	885	-	-
3. Twinning Arrangments	-	-	381	100.0	-	-	381	0.4	381	-	-
Subtotal Technical Assistance	-	-	10 706	84.1	2 030	15.9	12 736	14.1	12 736	-	-
D. Training											
1. Courses											
Local	-	-	6 547	100.0	-	-	6 547	7.2	-	6 547	-
Overseas	-	-	3 989	100.0	-	-	3 989	4.4	3 989	-	-
Subtotal Courses	-	-	10 536	100.0	-	-	10 536	11.6	3 989	6 547	-
2. Other											
Workshops	-	-	-	-	294	100.0	294	0.3	-	294	-
Study Tours	-	-	540	100.0	-	-	540	0.6	-	540	-
Others	-	-	-	-	614	100.0	614	0.7	300	314	--
Subtotal Others	-	-	540	37.3	908	62.7	1 447	1.6	300	1 147	-
Subtotal Training	-	-	11 076	92.4	908	7.6	11 984	13.2	4 289	7 694	-
E. Operation & Maintenance											
1. Salaries and Wages											
Incremental	381	60.1	-	-	253	39.9	634	0.7	-	634	-
2 Incentives awards	150	25.0	-	-	450	75.0	600	0.7	-	600	-
3. Maintenance											
Works	382	40.1	346	36.2	226	23.7	954	1.1	-	868	87
Goods	5 505	35.6	7 127	46.1	2 844	18.4	15 476	17.1	-	14 069	1 407
Subtotal Maintenance	5 888	35.8	7 473	45.5	3 070	18.7	16 431	18.1	-	14 937	1 494
Subtotal Operation & Maintenance	6 419	36.3	7 473	42.3	3 773	21.4	17 664	19.5	-	16 170	1 494
Total	12 432	13.7	60 052	66.3	18 158	20.0	90 642	100.0	59 270	24 176	7 196

² purchase by the Government of existing buildings



ORGANIZATION AND MANAGEMENT

1. The EARO will be responsible for the overall implementation of the project. However, the responsibility for actual implementation of various components and sub-components will rest with: (i) EARO; (ii) research centres, including specialized institutes; and (iii) AUA. The RCs and AUA will receive funds from and be accountable to EARO in the implementation of project activities. To this effect, EARO will enter into memoranda of understanding with: (i) regional governments/regional research centres (RCCs); (ii) the AUA; and (iii) the Ministry of Agriculture. These memoranda will be signed before effectiveness. In accordance with Proclamation No. 79/1997 dated 5 June 1997, EARO is an autonomous organization primarily responsible for building up research capacity consistent with the development needs of the country, and establishing a system that will make agricultural research efficient and effective. It will also be the focal point for channelling all donor assistance for agricultural research, and developing and maintaining links with international and regional agricultural research centres. The EARO mandate requires that it should facilitate mutual support between agricultural education, research and extension, and participate in the development and upgrading of human resources. The EARO is also responsible for providing technical leadership and direction in research programme formulation, prioritization as well as budgetary support to a country-wide network of federal (FRCs) and RRCs, AUA and other higher learning institutions. EARO will be accountable to the Prime Minister. Detailed staffing plans with job descriptions for key positions have already been prepared. The Director General (DG) of EARO has also been appointed. Adequate office space has been allocated and some of the staff are already in place. Even though EARO is structured as a lean organization, it will build capacity to address the coordination and management aspects of agricultural research, as well as the economic and social (including gender) issues. It will rely, in appropriate cases, on consultants' services for execution of discrete tasks, particularly where short-term expert assistance is required.

2. More specifically, the **EARO will**: (a) define procedures for stakeholder consultation and collaboration; and (b) beginning in project year 2, annually prepare a five-year research-action plan (a rolling plan), giving firm action programme for one year and indicative for the remaining four years; (c) annually approve the specific research programme of each RC as well as for contract research in accordance with priorities and available fiscal and human resources; (d) ensure adequate linkages between various RCs and external research entities of excellence; (e) establish an efficient information and documentation system using telecommunications and computing facilities for the EARS and cooperating institutions like AUA; (f) strengthen arrangements for the transfer of on-the-shelf and newly generated technology to the farmers, *inter alia*, by fostering strong research-extension farmer linkages at the RC level; (g) encourage greater participation of women in research and provide for gender sensitivity in the development and targeting of research programmes; (h) finalize various operational, financial, accounting and budget manuals, and through training and workshops, ensure adherence of each implementing agency to the prescribed procedures; (i) hold an annual technical review of the performance of each research programme/RC in the outgoing year and the proposed work programme and budget for the next year, and share its findings with a wide community of stakeholders including extension staff, donors, and NGOs and solicit their views through the research-extension advisory councils and the national workshop on agricultural research; (j) three months prior to the beginning of each fiscal year, prepare an annual human resource development plan, based on the approved five-year rolling research action plan and the criteria of "minimum critical mass" needed to implement the research-action plan. This plan will be cleared with IDA/IFAD prior to implementation. EARO will also prepare, by 31 December 1998, an agricultural research strategy paper and share it with IDA/IFAD and other donors. It will also build capacity within EARO, to make economic evaluation of various research proposals, and to review and advise on gender-related issues. Furthermore, EARO will delegate powers for making operational



expenditures to respective RCs, which will be provided with adequate budgetary allocations at the beginning of each fiscal year.

3. Each research centre will be responsible for: (a) stakeholder and beneficiary consultation and collaboration; (b) defining the research agenda and priorities in a participatory manner, based on a farming-systems approach; (c) annually preparing a detailed action plan, including staff and budget required for each research activity and upon approval, implementing it; (d) ensuring close linkages with extension agencies; (e) ensuring timely and efficient implementation of ARTP activities; (f) establishing and maintaining separate accounts related to ARTP activities; and (g) submitting quarterly reports and returns to EARO to help in project monitoring, supervision and evaluation. The AUA, as the principal provider of scientific human resources for EARS, will be the key implementing agency for the human resource development plan, as well as the strengthening of the infrastructure facilities at AUA. It will also have a procurement cell of trained staff to efficiently handle all the procurement requirements of AUA under ARTP; and will send quarterly implementation progress reports to EARO. In addition, it will engage in agricultural research, in contract with EARO, or/and on its own to support practical teaching and guidance to university students in various agricultural disciplines.

4. **Project coordination.** While implementation and monitoring of various project components will be the responsibility of respective line departments within EARO, AUA, MOA and RRCs, the overall coordination of ARTP will be the responsibility of the Director General, EARO. In the performance of this task, the DG will be assisted by an ARTP coordination office. This department will be responsible for ensuring that all line departments and implementing agencies take timely and coordinated action, and channel all reports to and correspondence with IDA/IFAD through the ARTP coordination office. Project coordination will be ensured at the federal level with the PM's office and concerned ministries, through the DG/EARO. However, at the research centre level, client participation in programme review and planning will be ensured by establishing close linkages with extension agencies and other stakeholders. To strengthen the inter-institutional coordination and cooperation, MOA, AUA and selected representatives of the regional governments, will, in rotation, be nominated on the EARB. Established under Proclamation No. 79/1997 dated 5 June 1997, EARB will guide, direct and supervise the EARO and, through it, be responsible for approving annual, medium and long-term research strategies and programmes, and ensuring effective coordination among all research entities and with other government agencies. The EARB has already been nominated by the Government and is presently functioning.

5. **Monitoring and evaluation (M&E):** Project M&E will be the shared responsibility of EARO/AUA/RABs/RCs at their respective levels. Relevant data collection, validation, analysis, and dissemination will be the responsibility of the EARO. M&E will be guided by: (a) the Government's Letter of Sectoral Policy; (b) project design summary (logical framework) with monitorable indicators; and (c) the project implementation manual (PIM). M&E will be conducted through: (i) monthly progress review meetings on ARTP chaired by the DG, EARO; (ii) IDA supervision missions; (iii) MTR of project implementation jointly with IDA/IFAD no later than 36 months after effectiveness; (iv) baseline and subsequent annual beneficiary surveys to monitor trends in adoption rates; and (v) assessments by peer reviewers (at least twice during the life of the project by external reviewers). The primary objective of M&E will be to ensure research relevance, scientific rigor and research quality. Twice each year (by 31 July and 31 January), EARO will transmit to IDA/IFAD progress reports on project implementation and outcomes, using the format agreed at the project launch workshop. An implementation completion report (ICR) will be prepared within six months of the loan closing date.

**FINANCIAL AND ECONOMIC ANALYSIS**

	Present Value of Flows		Fiscal Impact	
	Economic Analysis	Financial Analysis	Taxes	Subsidies
Benefits	106.9	126.4	nil	nil
Costs	67.5	77.9	10.4	nil
Net Benefits	39.4	48.5	--	--
IRR	19%	19%	--	--
B/C	1.6	1.6	--	--
Switching Values				
- Costs	59%	62%	--	--
- Benefits	-37%	-38%	--	--

Cost Benefit Analysis

1. **Main assumptions:** The economic cash-flow has been computed in constant 1997 prices, expressed in foreign currency (USD) at border-price level. Financial costs in constant prices are set equal to financial costs in current prices minus price contingencies. Further, the economic costs in current prices have been obtained by allowing for reduction of the financial costs in constant prices equivalent to the amount of taxes and duties. In economic terms, the project costs are about USD 78.7 million equivalent; the economic investment costs are estimated at the equivalent of USD 62.9 million, while the recurrent costs will total the equivalent of USD 15.8 million during the six project years.

2. The development objective of the project is to accelerate the identification, testing and release, and the transfer to the extension services for adoption by the farmers of improved technologies in crop and livestock production and natural resource management. This will result in incremental production due to prevention of losses following the delayed release of technologies in the “without” project scenario, and therefore of increased income for the farming population at large and in particular the smallholders, both in the high potential areas (highlands) and in the low potential areas (lowlands).

3. The analysis of incremental production is, due to a lack of data on livestock production and research, confined to incremental production of cereals only. The total high potential areas (HPA) is estimated to cover approximately 5.5 million of hectares, while that demarcated as low potential areas (LPA) presently covers about 1.1 million hectares. While the HPA will be constrained in the future by its present geo-physical boundaries, that of the LPA will increase due to population growth and possible increases in area under irrigation. However, the increase in LPA cultivated area is not taken into consideration in the assessment of project benefits.

4. A detailed, focused and prioritized research plan is not yet available; the development and subsequent implementation of such a research plan is one of the activities that has to be carried out in



APPENDIX VII

Project Year 1. In the absence of a research plan, it has been assumed that most of the output from research focusing on the HPA will be in the form of “maintenance research”, that is, research that guarantees avoidance of the genetic breakdown of plant material. It is assumed that the benefits in the LPA will be the result of hithertho lacking appropriate technology, but made expressly available the by the project in the form of “farming systems research”, geared to alleviate the production constraints in these areas.

5. It is further assumed that the application of the technologies of “maintenance research” generated by the project will not entail any incremental costs of production for the farmers as the farmers who apply the project-generated research will in the “without” project case have applied the conventional improved technology at identical costs. Indeed, the proposed project will generate new crop varieties to replace in a more timely manner, the existing varieties that gradually become prone to pests and disease following continued use. Application of “farming-systems research” will, on average, entail an increase in economic production costs equivalent to about 20% of the financial incremental value of production; the incremental production costs are thus obtained by allowing for a value/cost ratio of 2.5 and a conversion factor of 0.5 (the latter obtained by assuming that half of incremental costs is labour and the shadow cost of labour (unskilled/off-season) is zero).

6. It is assumed that the benefits from “maintenance” research will be generated starting Project Year 8 and that the technologies generated by such research will be initially adopted (through replenishment of seed and adoption of recommended practices) by one fifth of the actual 30% adoption rate in the HPA, all of which presently use the improved technological packages. The adoption rate for improved technology is assumed to increase to 36% by Year 20 “without” the project and all of the benefits will thus be generated in the period beyond the project implementation. The “likeliest” average period yield for cereals is set at two tonnes per hectare “with” the project, and at 1.8 tonnes per hectare “without” the project.

7. It is further assumed that the adoption of “farming-systems research”-generated technology will start at a level of 0.8% of the LPA area in Project Year 8 and will gradually evolve to reach 18% in an additional 15-year timespan. The “likeliest” average period yields in the LPA areas is set at 0.9 tonnes per hectare “with” the project and at 0.7 tonnes per hectare “without” the project. Average (economic) farmgate value of cereals is set at USD 170 per metric tonne based on import substitution (while cereals are valued at an average of USD 200 equivalent per metric tonne at the farmgate in financial terms).

8. **Risk Analysis:** A risk analysis (2 500 random trials, Monte Carlo sampling technique) has been performed by: (a) allowing for minimum and maximum values of the parameters described in the foregoing; and (b) assigning probabilities of occurrence to such events. In the absence of a sufficiently strong data base, the triangular type of distribution has been applied on all assumptions.

9. The **economic analysis** reveals that based on the economic costs and benefits noted above, the internal rate of return of the project is 19%. The risk analysis reveals a certainty level of about 70% that the economic rate of return is at least equal to the opportunity cost of capital or 12%. Equally, there is a 70% certainty that the present value of benefits will equal the present value of costs and the net present value of the project is at least zero with the benefit-to-cost ratio at least 1. A sensitivity analysis, performed on the costs and the benefits, reveals that the costs increase margin is 59%, given a stream of benefits identical to the base case, whereas the benefit margin is -37% given a stream of costs identical to the base case. It can thus be concluded that the project risk is low to very low, particularly if one considers that substantial benefits potentially deriving from incremental livestock production were not taken into account.