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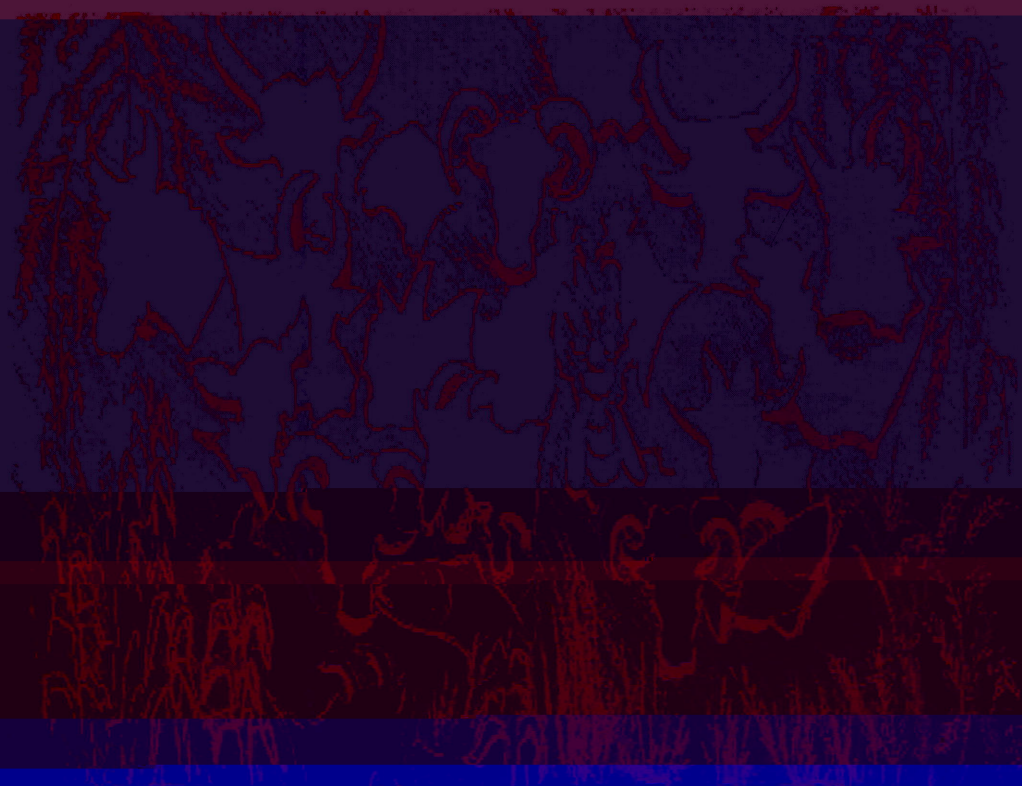

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Aims and Scope: The Ethiopian Journal of Animal Production is a peer reviewed journal publishing original basic and applied research articles, short communications, technical notes, review articles dealing with livestock and livestock related issues. Although the journal focuses on livestock production in Ethiopia, papers from similar agro-ecological regions of the world are welcomed.

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Lessons learned from implementation of the Ethiopian Fourth Livestock Development Project: Experiences and Results

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Abstract

Prior to the implementation of the Fourth Livestock Development Project (FLDP) the World Bank had assisted three livestock development projects in Ethiopia. The first had concentrated on dairy development and milk processing, the second on livestock marketing and domestic abattoirs and the third on rangeland management; all had enjoyed some limited success but their achievements had been dissipated by socio-economic and political circumstances. In the wake of the drought and famine situation of 1984, it was considered appropriate to focus livestock development attention on peasant areas, where livestock and crop production are intimately interdependent. In this respect the Fourth Livestock Development Project was prepared, appraised and implemented from1987-1994. The primary objectives of the FLDP were to increase livestock and agricultural production by improving animal health and nutrition. Project components comprised: animal health; animal nutrition; pilot – range land management; credit for livestock development; institutional development and a livestock export trade development. At project implementation the project has generally achieved it broad objectives, but the experiences and results differed between components. The paper provides the details of FLDP's implementation experiences, results and lesson learned.

Keywords: Ethiopian Fourth Livestock Development Project, Lesson Learned, Implementation, Experiences, Results.

Introduction

During the 1970s World Bank had assisted livestock projects, which were concentrated on improving dairying, marketing, abattoir facilities and on rangelands. All projects had enjoyed some limited success but their achievements had been dissipated by socio-economic and political circumstances. After the disastrous famine of 1984/85, it was considered appropriate to focus livestock development attention on peasants' areas. This approach was sound, because most of the livestock in the Ethiopia are found in the peasant areas, and improvement of livestock means improving agricultural

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production and the well being of peasants. The Fourth Livestock Development Project has made a complete turn round from the objectives of the previous World Bank Credit- assisted livestock projects, which concentrated on improving dairying, marketing, abattoir facilities and on rangelands. The FLDP has aptly focused on peasants in the highlands, where the bulk of the farmers and livestock are found, and aimed at tackling the main problems of livestock, i.e., diseases and under nourishment. Testing some innovation on Southern Rangelands Development Unit (SORDU) was also relevant at this program was a relatively successful undertaking within the range development activities under the Third Livestock Development Project. FLDP was implemented from 28 April 1987 to December 31, 1994 with the following objectives and components.

Project Objectives and Components

The main objectives of the Fourth Livestock Development Project were to increase livestock and agricultural production by improving animal health and nutrition. Project components comprised: (i) animal health improvement which include strengthening of field - services, national disease investigation, laboratories, epidemiological services and vaccine production; (ii) animal nutrition improvement through improved forage production, intensive small scale fattening; (iii) pilot range management and utilization by agro-pastoralists in southern rangelands; (iv) credit for peasant livestock development, including for fattening and veterinarian needs; (V) institutional support to the Ministry of Agriculture (MoA) through staff, technical assistance and provision of equipment; and (Vi) a livestock export trade development study.

Materials and Methodology Used

Location of the project area

Fourth Livestock Developmental Project (FLDP) was focused predominantly on high potential areas within four of the more productive zones established by Government of Ethiopia (GOE) for development purposes and containing six of Ethiopia's 14 administrative regions. While the national dimensions of the animal health component covered most of the country, the animal health field services concentrated in about 140 Woredas in the following zones: Central (Shewa), Western (Welega-Illubabor-Kefa), North Western (Gojjam), Eastern (Hararghe). The project animal nutrition activities implemented largely in Shewa, Hararghe and Gojjam regions. These zones are currently largely accommodated in Regions 3, 4 and 14. In addition FLDP provided support in the form of a pilot project to Southern Rangelands Development Unit at Borana. The project area average population density at that period was 15% above the national average as shown in Table 1. These

data, however, distort the picture especially in Hararghe, where the great majority of the population was found in the comparatively small highland area.

Table 1: Fourth Livestock Development Project (FLDP Area and Population (1984)

	Hararghe	Gojjam	WIK	Shewa	Total Project Zones	All Ethiopia
Area (sq. km)	254,800	64,400	174,000	86,000	578,000	1,220,000
% of Ethiopia	21	5	14	7	47	100
Population ('000)	4,152	3,245	5,783	9,503[2]	22,683	42,000[1]
% of Ethiopia	10	9	14	23	54	100
Population						
Density per Km^2	16	50	33	111	39	34
Total Awrajas	8	7	17	11	53	110
Total Woredas	34	25	122	105	296	586
Project Woredas	10	20	50	60	140	---

1/ Based on the results of the May 1984 population census.

2/ Includes Addis Ababa

Source: CSA (1991).

Topography, Rainfall and Soil: Although altitudes in these zones vary from 500m to 3,000m above sea level, the high potential cultivated areas are on rolling high plateaus of between 1,500 and 2,500m. Water logging prevents cultivation in the valley floors. Rainfall averages between 800 and 2,000 mm annually in the majority of peasant farmers' areas in Go jam, Wellega, Illubabor and Keffa (WIK), Sheba and Hararghe. Except for WIK, Western Gojjam and Western Shewa, rainfall is largely bimodal with short rains in February and long rains between May and September. Soils are comprised largely of free draining Nitosols (red), although heavy vertisols (black) are found in large areas of Shewa and in valley bottoms throughout all six-project regions. In the areas with adequate rainfall soil fertility and suitability for agriculture was good.

Project Costs and Financing

The FLDP was prepared under the Third Livestock Project (Cr. 603-ET) in 1984/85, and appraised in March 1986. This led to the approval of an International Development Agency (IDA) credit 1782-Eth finance on 28 April 1987. Subsequently an International Fund for Agricultural Development (IFAD) loan was also approved to provide livestock production credit. Both the credit and loan, which were to be disbursed over five years, accounted for about 82% of the total costs. The IFAD loan closed at the end of December 1992, as scheduled, while the IDA credit was closed on December 31, 1994, following two years of extension. Detailed Project Costs and Financing is shown in Table 2a and 2b.

Table 2a: Project Costs

	Item	Appraisal Estimate (US$'000)			Latest Estimate US$'000
		Local Costs	Foreign Costs	Total	Total
1	Animal Health	10,200	13,200	23,400	27,107
2	Animal Nutrition	2,400	2,800	5,200	2,985
3	S.O.R.D.U.	2,100	2,600	4,700	1,776
4	Agriculture Credit	3,100	3,200	6,300	6,395
5	M.O.A. Institution Building	2,200	3,100	5,300	1,568
6	Livestock Export Trade	0		500	409
	Sub-total	**20,000**	**25,400**	**45,400**	
	Physical & Price Contingencies	4,100	7,700	11,800	
	Sub-total:[a]	24,100	33,100	57,200	
	Minus taxes and duties	(5,300)			
	Total Cost[b]	**18,800**	**33,100**	**51,900**	**40,240**

[a] Including taxes and duties.

[b] Excluding taxes and duties.

Table 2b: Project Financing (US$'000)

Source	Appraisal Estimate	Latest Estimate
Government of Ethiopia[a]	5,200	1,362
IDA	39,000	32,483
IFAD	7,700	6,395
Total	51,900	40,240

[a] Excluding taxes and duties

Source: FLDP Implementation Completion Report, November 1995

Project Organization and Management

The project provided for a management arrangement in which the Vice-Minister of the Ministry of Agriculture (MOA) Animal and Fisheries Resources Development Main Department (AFRDMD) became the ex-officio Project Manager (PM). He was to be assisted by two Deputy Project Managers (DPMs); the head of the Veterinary Service Department and that of the Animal Production Department, to be responsible, respectively, for the implementation of the animal health and animal nutrition components. A Project Coordination Unit (PCU) was to be established, and two coordinators were to be appointed to assist the DPMs. Subsequently, only one Project Coordinator (PC) was appointed. The rangelands pilot component was to be implemented by the Southern Rangelands Development Unit (SORDU), a semi autonomous unit operating under the overall responsibility of the Vice Minister of AFRDMD.

The Agricultural Input Supply Corporation (AISCO) was designated to import all veterinary drugs and vaccines, while the Agricultural and Industrial Development Bank (AIDB) was to implement the credit component. The Institute of Agricultural Research (IAR) and International Livestock Center for Africa (ILCA) were to become cooperating institutions in forage systems development. The latter was also to implement SORDU's research/survey activities.

Experiences and Results of project implementation

General

The approval by IDA of a Project Preparation Facility (PPF) had enabled

are discussed below.

Animal Health

General

Prior to the early 1970's Ethiopia's veterinary services had concentrated on the control, by the delivery of free vaccination services, of the major epidemic infectious diseases. Primary attention had been directed to the control of rinderpest and pleuropneumonia. As a participant country in the African wide campaign to eradicate rinderpest (JP 15), this disease had been greatly reduced and remained only as endemic foci in areas where it was difficult to provide vaccination services. At this time curative drug supplies had been available through private suppliers and agencies of the major international drug manufacturers. After 1974, private drug suppliers were discouraged and the sole legitimate source of curative drugs was the government services, although cross border unofficial market supplies continued. FLDP proposals were to build on the existing services in the project area by making staff more effective by improved training and supervision; where applicable by deploying them closer to farmers; by providing appropriate equipment and transport; by ensuring that a reliable supply of

drugs and vaccines was available; by improved diagnostic support and ultimately by concentrating on the control of the economically most important diseases. Continuity of these services was to be secured by improved cost recovery of expenditure on animal health. To further extend services to the farmer, Government of Ethiopia (GOE) employed Animal Health Technicians (AHT) and Service Cooperative employed Farmers Animal Health Representatives (FAHR) were to be trained in basic diagnostics and the dispensing of a limited range of drugs (largely anthelmintic for the treatment of endoparasites), and would staff SC retail drug stores. It was anticipated that between 5-8 SCs would be formed in each of the 140 project Woredas; giving a target of some 900 SC drug outlets over the project period (Table 3). Hierarchical supervision and support for these field staff was to be provided by GOE employed Animal Health Assistants (AHA) at the Woreda level, Assistant Veterinary Officers at the Awraja level, and Zonal Veterinary Officers (ZVO) at Zonal HQ. The ZVO had direct responsibility to the Chief Veterinary Officer (CVO) for technical matters, although for administrative purposes to the Zonal Administration. At the national level, and with a view to equipping the veterinary services for future demands, components were included to create a Veterinary Epidemiology and Economics Unit (VEEU); a Central Disease Investigation Laboratory (CDIL); to improve vaccine production capability at the National Veterinary Institute (NVI); and to assist the Tsetse and Trypanosomosis Control Unit and the Veterinary Faculty. The experiences and results of implementation of these components are described below.

Veterinary Drug Procurement and Distribution: Procurement of veterinary drugs fell far behind schedule and was major area of concern. Initially, the main reason for the delay was impractical veterinary drug testing requirements, which proved cumbersome, time consuming and unacceptable to some manufactures. This was exacerbated by lengthy bureaucratic procedures between the project and Agricultural Input Supply Corporation (AISCO). Due to this, a regular and sustained supply of drugs could not be accomplished. The major supplies arrived in two consignments in 1991 and 1992, but by this time the effort expended in training Farmers' Animal Health Representatives (FAHA) and in encouraging Service Cooperatives (SC) to retail drugs had been dissipated. AISCO did not become involved in drug distribution and all consignments received were passed to MoA. In respect of cost recovery, AISCO added a margin of 15% to the costs incurred of deliveries CIF Addis Ababa plus customs and clearance. MoA then distributed drugs to their outlets at cost and without clear instruction on any mark up procedures contrary to proposals at appraisal no revolving fund was established and proceeds accurate to treasury. The result is that MoA remains on donor agencies and NGOs for supply of drug at that time.

Veterinary Field Services: The main thrust of the Veterinary Field Services was to improve the delivery of services to the primary animal producer by providing drugs, basic equipment, vaccinations, trained advisers and diagnostic support at the local level. To this end GoE staff were trained and equipped with means of transport before they were redeployed into about 140 Woredas that were accessible to road transport. The impact of the veterinary field service was constrained by lack of drugs and their service limited to providing some vaccination services.

Veterinary Epidemiology and Economics Unit (VEEU): The importance of the VEEU and its potential cannot be over-emphasized. At establishment technical assistance expeditiously installed computer hardware and developed appropriate software. At the same time an intensive post-graduate training program ensured that trained Ethiopian staff were available to take over. An initial herd health and productivity-monitoring program prepared by VEEU, established baseline cattle productivity data from 9 regions in the project area. Complementary data collection, collation and dissemination programs were established for veterinary field services, diagnostic laboratories and meat hygiene service. The VEEU has recently been relocated to the new Animal Health Research Center (AHRC) building.

Central Disease Investigation Laboratory: This laboratory, now designated as the Animal Health Research Center (AHRC), was targeted to be used as a national disease diagnostic center tabbing over the diagnostic activities, which had been accommodated in the National Veterinary Institute (NVI). Its construction was the only major building program envisaged at appraisal, and preparatory work proceeded reasonably well as the construction contract was awarded in August 1989. In spite of an early start of construction works, the laboratory and associated buildings were not fully commissioned during completion of the project. The reasons for the delays in the earlier years are in part attributable to the lack of construction material. It is unfortunate that the TA input has not coincided with the full commissioning of the laboratory. However, at the end of the project completion the TA made a valuable contribution in installing some of the scientific equipment, training and preparation of manuals.

National Veterinary Institute: Project support to the NVI primarily directed to the rehabilitation and improvement of its existing vaccine production capability. Although there have been some shortcomings with the delivery of the appropriate equipment and some damage to equipment in transit, the NVI possesses considerably enhanced vaccine production capability. This is claimed to have doubled its potential output, increased the range of vaccines, and enhanced its export potential.

The anticipated addition of a Foot and Mouth Disease (FMD) and rabies vaccine production units were excluded from the project because of the doubts on their economical viability and the small requirement of the vaccine at that time. Instead strong support was given to the rehabilitation and expansion of the NVI vaccine production in complex, enabling it to up-grade it manufacturing practice to international standards and to double its production potential.

Tsetse and Trypanosomosis Control Unit: Tsetse fly transmitted Trypanosomosis is a major cause of losses and reduced animal production in western Ethiopia. FLDP committed support for field buildings, equipment, vehicles and overseas training. With this support Tsetse and Trypanosomosis Control Unit has established a field laboratory at Bedelle in the west of Region 4 with three supporting houses. With TA (FAO) this Unit has made considerable progress. On a trial basis 1000 square km were cleared with the use of insecticide impregnated odour baited targets in the Upper Dedessa valley. Latterly "spot on" treatments of insecticide have proved successful and more sustainable method. The materials from targets are frequently stolen, whereas, the treatment of cattle is less demanding in labour and insecticide. After the initial reduction of fly population by monthly applications, two monthly intervals have been found to be effective. 130-200,000 sq km of western Ethiopia are considered to be infested with

Animal Nutrition

General

Animal nutrition improvement activities were concentrated in (a) areas of soil conservation programs; (b) areas with intensive extension systems; and (c) areas where fattening and milk production systems were established. Consistent with the political philosophy of the time activities would focus on the Peasant Associations (PAs), Services Cooperatives (SCs) and Producer Cooperatives (PCs). Over five years it was anticipated that 630 PAs in 200 SCs would become involved. Three components were conceived for Forage Seed and Seedling Production, Forage Systems Development and a Small Scale Fattening Scheme. Throughout the project implementation period the responsible officials of formerly the Animal Production Department (APD) and latterly the Animal Production and Forage Team of the MOA, and their colleagues in the Zones and Regions, have shown commendable adaptability in the face of changing political and economic circumstances. A summary of the implementation experiences and results are given below.

Forage Seed Seedling Production

Initially seed for forage and tree legumes, and grasses was available in very limited quantity or completely unavailable. Originally it was thought that seed and seedling production would be from small MoA production units and nurseries, and within PAs and PCs on a contract basis. As the project developed seed production by individual farmers has contributed to seed supply. Ninety four tons of seed have been imported but local seed production has risen continuously to a production of 160 tons in the year 1994/95. In the earlier years of the project locally produced seed included tree legumes, *Vetch, Cowpea, Dolichos lablab, Siratro, Stylosanthes hamata cv seca and Verano, Green and Silver leaf desmodium, Lucerne* and tropical grasses. Latterly the varieties of locally produced seed have decreased although quantities have continued to increase. This reflects both the demand for seeds of the proven varieties, tree legumes, *Vetch, Cow pea and Stylosanthes hamata cv Verano*; and the acceptance of contract production by individual farmers of the more readily harvestable characteristics of these species. Seedling production has been similarly rewarding. During implementation over 10 million seedlings have been raised, largely of *Leuceana, Sesbania* and *Tree lucerne*, and distributed and production has been shifted from government and non-government nurseries to private backyard production. The further development of seed production of the valuable perennial herbaceous legume and grass seeds which are less readily produced by contract growers is a recognised problem. This may have to be solved by other seed production systems. Project staff were also aware that seed quality was a concern when produced by contract growers and as yet there was no quality control. Small scale contract seed production has great advantage in widespread

demonstration, distribution of seed to neighbours and provision of cash income. The further advantage of soil nitrogen fixation are yet to be fully demonstrated. Seed stores have been built at Kaliti, near Addis Ababa, and at Bahir Dar.

Forage Development

As the project started, a Forage Systems Development Unit (FSDU) was established to spearhead forage development. IAR provided two post-graduate students for field work and ILCA assisted with experimental design, advice on the choice or planting material and seed samples. After accomplishing field trials in the earlier years of the project, the importance of the FSDU was considered to be reduced, overshadowed by the rapid forage development in the project area. Seven forage introductory strategies have been developed under the project: a) sowing stock exclusion degraded grazing areas as a conservation measure (9,000 ha); b) over-sowing with grass or legumes seeds by broadcasting on communal pasture and on road sides (11,000 ha); c) establishing forage strips and alley strips (18,600km); d) back-yard forage production by providing an array of multipurpose tree (10 million seedlings) and forage legumes and grasses; e) under-sowing, particularly with annual legumes in maize and sorghum fields (17,500 ha); f) sowing of pastures with mixed grass and forage legumes (1,176ha); and g) growing of forage under perennial trees (82 ha). The estimated area covered is conservative as the project has supplied seeds to many institutions concerned in forage development. These activities are likely to make a major contribution to Ethiopian agriculture if pursued further (Table 3).

These strategies warrant some more detailed discussion as they were designed to be implemented widely by peasant association within crop/livestock cropping systems and natural resources management areas (Alemayehu and Robertson, 1988).

(a) Stock exclusion zones for the restoration of pasture and for the prevention of further erosion were practical under the discipline of the PA. Forage trees *Leucaena and Sesbania,* legumes: *Siratro and Stylosanthes* varieties and grasses *Phalaris, Rhodes grass and Setaria* were introduced both by hand planting and by seed broadcasting. Total livestock exclusion was enforced and the forage harvested and used by cut and carry. Technically this system was successful, but the benefits perceived by the individual have not allowed further expansion of this strategy currently.

(b) Broadcasting on communal pasture and on road sides with Stylosanthes and other species has also been extremely successful in introducing improved forage plants depending on the altitude. Again the individual farmer, whilst appreciating the benefit, does not enjoy sole privilege of the resultant fodder and this system will have to be expanded through community adoption.

(c) Forage strips: *Vetch, Siratro, Lucerne, Desomodiums* and alley strips *Lucaena* and *Sesbania* have some of the limitations of broadcasting. Sole use is assured only provided the forage can be harvested and conserved before the cultivated area is available to other grazers. The impressive alley strips of *Sesbania* planted on bunds as a soil conservation measure are reported to have been depleted by severe cutting for firewood.

(d) Backyard forage production was undoubtedly the major success from the adoption point of view. Varieties are influenced by the altitude but include *Sesbania*, *Leucaena, Tree lucerne*, and a variety of herbaceous legumes and grass. The participating farmer accrues the full benefit of the fodder produced and has sole use for his animal feeding.

(e) Under sowing of maize and sorghum particularly was being widely adopted. *Vetch*, being and annual, is most appreciated for this strategy. It may be harvested almost in entirety when the crop stover is conserved for forage and unlike a perennials legume it does not interfere with cultivation in the following season.

(f) Establishment of mixed grass legume pastures *Rhodes grass, Setaria, Siratro* and *Desmodium* is likely to remain applicable only on enclosed land where the owner has exclusive use of the fodder produced. The demand for this technique will certainly expand as the dairy industry grows.

(g) The production of forage under perennial tree crops is a strategy that is widely practiced in other countries. The experience in Ethiopia is currently limited to citrus. It should have greater opportunity as the tree crop owners should enjoy sole access.

The growing of oats both for grain and for livestock fodder has been long practiced in Ethiopia. The demand for cut and carry forage for dairy

production is leading to the expansion of this technique as a cash crop. It is now common to see green oats being harvested and transported to the peri-urban dairy areas and for fattening. FLDP project staff have recognized an opportunity here to improve crop value and have introduced vetch to be grown with the oats. No estimate is available of the area currently sown in this way, but widespread adoption is reported.

Small Scale Fattening

This activity was based on the success of limited trials in the Nazareth/Modjo area of feeding crop bi-products supplemented with molasses and urea. Liquid molasses is produced by nearby sugar factories at Shoa and Wonji. Transport of molasses requires a tanker and although two PCs possessed small storage tanks, replenishing their supplies proved problematic. To resolve this, consultancy advice advocated the production of molasses/urea blocks. It was essential that a SC adopt this activity as the capital requirement was beyond that of the individual. There was also strong competition for the other ingredients of urea and grain bi-products for dairy and poultry rations. At this juncture the reintroduction of a more liberal economic environment saw a rapid growth of large-scale commercial cattle finishing in the Nazareth/Modjo area. The large scale feedlot could readily handle liquid molasses and dominated the market for this and other crop bi-products (There were 26 large scale feedlots in the area-Region 4 estimation). The block manufacturing concept, although sound technically, encountered practical difficulties in the supply of molasses. The project had made no specific arrangements for the supply of material or for the manufacturing of the block. The credit for fattening was later diverted to the purchase of draught animals, because of lack of demand from fatteners. FLDP staff thus focused on a forage finishing strategy based on the success of backyard forage production. Such fattening is a feature of traditional small scale production in Hararghe, using crop residues. FLDP staff have introduced the system throughout the project are using backyard produced improved forage. Some 8,000 cattle and 460 sheep/goats are reported to have been finished/fattened during the project period (Table 3). These figures are certainly an under estimate as many farmers are finishing cattle with out the awareness of the project staff. The system was seasonally practiced to fit in with cereal production and to meet the local peak demands for finished livestock.

Southern Rangelands Pilot Project

Under the Third Livestock Development Project (TLDP), the Southern Rangelands Development Unit (SORDU) had become the most firmly established rangeland management unit. Other areas of activity in the North Eastern Rangelands (NERDU) and in the east Jijiga Rangelands Development Unit (JERDU) had encountered civil unrest and sociological problems.

Although completely unallied to the main thrust of FLDP, it was justified to provide continuing support to SORDU as it remained the sole repository of pastoral and rangeland experience in Ethiopia. Modified activities in the pilot project intended to introduce as much pastoralist participation as possible to address the long term sustainability of the project. Components included: a) animal health and nutrition. b) range management; c) cooperative development; d) cattle marketing and fattening; and e) research/survey work in cooperation with ILCA.

Physical achievements during the project period have been slow and modest, reflecting the accepted difficulties of working with pastoralist communities. Veterinary services provide a prophylactic vaccination service and rinderpest and contagious bovine pleuropneumonia are under control; from the pastoralist community 12 veterinary scouts have been trained to staff the SC drug stores and 20 pastoralists as Primary Animal Health Auxiliaries. The traditional range management strategies of transhumance have come under pressure by increasing livestock and human populations. Bush encroachment and hillside erosion are recognized as major problems. SORDU range management interventions concentrate on the development of bush control strategies, the most promising of which appears to be controlled burning (14,000ha). This is a proscribed activity under current legislation and review of this law is probably justified. Range monitoring sites (17) and the post-graduate training of a Range Ecologist has equipped SORDU for long term range assessment. Some progress has been achieved with supplementary hay feeding for calves.

Cooperative development has led to the formation of five SCs, one of which, now operates the Sarite finishing ranch (Table 3). The proposed transfer of two other ranches has not been realized. The SCs also operate veterinary drug stores and shops for small domestic requirements. Water development includes improvement of traditional wells, maintenance of ponds and the construction of cisterns. Much of this is achieved on a participatory basis with initiatives being generated by extension contact with the Borana pastoralists. Coppock (1994) describes the vulnerability of the pastoral system of the Borana and hypotheses that the pressure created within this society by population growth are now creating the conditions when collaborative interventions will be increasingly adopted. Six post-graduate students from the SORDU staff obtained MSc degrees, presenting their theses on studies in the project area. There is little doubt that SORDU should be maintained and strengthened as it remains as one of a unit continuing pastoralist and range management extension and research activities. This experience will be invaluable as further attention is directed to the large areas of Ethiopia with similar environments and problems.

Livestock Production Credit

Medium-term loans were made available through Agricultural and Industrial Development Bank (AIDB) to SCs for on lending to producer cooperatives and individual farmers. However, about 90% of the loan were extended for purchasing draft oxen, in pursuit of a reportedly successful IFAD program, which preceded the project. Birr 1.7 million was advanced for animal fattening. The envisaged cooperative production of molasses-urea blocks did not materialize and this has slowed demand for fattening. This is because of the gradual introduction of improved forage technology has re-stimulated demand for the fattening of animals. After the collapse of the previous regime and the loss of disintegration of the SCs, the repayment of loans had deteriorated markedly.

Institutional Development

A significant institutional strengthening input was provided under the project in the form of staff training, technical assistance, vehicles and other equipment, and this has boosted MoA's capacity to implement the project. About 130 people were sent abroad for degree courses programmes and for short term specialized training. A large number in service and on the job training were also conducted over 4,000 junior technical staff and 5,000 contact farmers participated in FLDP's training program. Technical assistance provided under the project was effective, and has been instrumental in transferring technical know-how, particularly in forage development and veterinary Epidemiology. The wide project area was well covered under the project thanks to the supply of a large number of vehicles. The extension effort of FLDP's staff was remarkable. The project produced over 30,000 extension materials, manuals and visual aids, which have raised extension agents to communicate well with farmers (Table 3).

Livestock Export Trade Development Study

The study was successfully completed in 1990. Its major recommendations were to export live animals to the Middle East; cattle to be directed to the Yemeni market and small ruminants to Saudi Arabia and to the Arab Emirates. The study considered the only entry to the western export markets would be for canned products e.g. large tinned corned beef and other canned products. The findings and recommendations of the study are considered still valid and of importance to the future development of livestock industry and has provided the country with useful export trade strategies.

Table 3: Key Indicators for Project Implementation

	Unit	Estimated	Actual
I. PERFORMANCE INDICATORS			
A. ANIMAL HEALTH			
Veterinary Field Services			
SC Animal Health Centres	No.	90	211
Training FAHRs	No.	900	135
Vaccinations 1992-95	No.	not specified	696,528
Trypanosomosis treatments	No.	"	42,605
Internal parasites treatments	No.	"	164,645
Training farmers in animal health	No.	"	4235
VEEU			
Establish VEEU	Institution	1	1
Train epidemiologists	No.	3	5
Animal Health National Elements			
AHRC Laboratory construction	complex	1	1
Rabies vaccine plant	No.	1	0
FMD vaccine plant	No.	1	0
Staff housing at Bedelle	No.	6	3
Artificial Insemination Centre	Set of equipment	Not foreseen at appraisal	Delivered
B. ANIMAL NUTRITION PROGRAM			
Forage Seed Production			
Seed stores	No.	6	2
Forage seed production	tons	63	160 (1994/95)
Multi-purpose tree seedlings	No.	not specified	10 million
Contact seed producers	No.	not specified	2,500
Forage Systems Development			
Forage strips	km	"	18,629
Backyard forage	No. of trees	"	89,999
	No. of sites		1,050
Under-sowing	ha	"	17,500
Stock exclusion	ha	"	680
Over-sowing of grazing land	ha	"	11,097
Arial Seedling Operation			
- medium seeding rate	ha	ha	5,000
- very low seedling rate	ha	ha	4,000
Roadside sowing	ha		1,850
Participating SCs	No.		332

Table 3: Key Indicators for Project Implementation (Continued)

	Unit	Estimated	Actual
Small-Scale Fattening			
By-product fattening scheme	No. of animals	12,500	3,890
Forage fattening scheme (cattle)	No. of animals	not foreseen at appraisal	8,000
Forage fattening scheme (sheep/goats)	No. of animals	not foreseen at appraisal	460
Extension Material Preparation			
Training			
- High level (BS & MSc)	No.	50	130
- Junior level (Diploma)	No.	2,000	4,000
- Contact farmer	No.	2,500	5,000
Forage Development Manual	copies	not specified	2,000
Fattening Manual	"	"	983
Forage Dev. Extension Manual	"	"	22,000
Forage Fattening Extension Manual	"	"	5,300
C. SORDU			
Establishment of Service Cooperatives	No.	27	5
Transfer of ranches to SCs	No.	3	1
Training of Veterinary Scouts	No.	not specified	12
Training of Pastoralist PAHC	No.	"	20
Range monitoring	sites	"	17
Manual bush clearing demonstration	ha	"	75
Bush control by burning	ha	"	14,000
II. Civil Works Buildings (Animal Health)			
Purchasing, Processing & Distribution Vet. Drugs			
Storage/Repackaging Plant	800 m^2	1	0
Central Investigation Laboratory			
Main Lab./Office	1250 m^2	1	1
Garage	100 m^2	1	1
Farm Animal Exp.	100 m^2	1	1
Animal Laboratory	100 m^2	1	1
Fencing	metres	2000	1
Housing			
Type A	105 m^2	11	11
Type B	85 m^2	7	7
Type C	55m^2	7	7
Hay Shed	180m^2	1	1
Small workshop	10m^2	1	1
Rabies Vaccine Laboratory	No.	1	0

Table 3: Key Indicators for Project Implementation (Continued)

	Unit	Estimated	Actual
National Veterinary Institute	Unit		
FMD Vaccine Production	No.	1	0
Large Animal Housing	No.	0	1
Tsetse & Trypanosomosis Control Unit			
Bedelle Laboratory	$200m^2$	1	1
CIVIL WORKS BUILDINGS (Forage Production)			
Forage System Development Unit			
Field Laboratory	$70m^2$	1	0
Forage Seed Production Unit			
Seed Storage Office	$105\ m^2$	6	2
Seed Drying	$225m^2$	6	0
Staff Houses	$50m^2$	6	Not Available
Covered Dry Racks	$20m^2$	6	Not Available
SORDU			
Laboratory	$100m^2$	1	1
Conference Hall	$100m^2$	0	1
III. VEHICLES			
Sedan (2 WD)	No.	5	4
Station Wagon (4 WD)	No.	27	27
Customised Pickup (4WD)	No.	5	0
Pickup standard (4 WD)	No.	21	0
Pickup Standard (2WD)	No.	14	59
Compact (4 WD)	No.	27	0
Vehicles (unspecified-drug procurement etc)	No.	5	0
Truck 3 ton	No.	1	2
Truck 7 ton 4 WD	No.	4	6
Double Cabin Pick-up	No.	9	82
Bus 30 seater	No.	3	3
Motor cycle	No.	173	214
Bicycle	No.	443	Not Available
Hard Top Pick-up	No.	0	2

Source: FLDP Implementation Completion Report, November 1995

Bank Performance

The World Bank mounted 10 supervision missions. The first 4, including one before project effectiveness, consisted of one person, specialist in livestock, while the remaining 6 were multi-disciplinary with an optimum mix of relevant specialization. The World Bank Supervision Missions were supportive

and keen to assist the project understanding the prevailing difficulties in the country. Often they were instrumental in resolving financial and other difficulties by discussing with Government of Ethiopia higher authorities, and by recommending World Bank's management to raise the disbursement percentage and to extend the project. Overall they performed satisfactorily (Box 1).

Borrower Performance

Considering the difficulties political and social situation that prevailed during the greater past of the implementation period, the Government of Ethiopia (GOE) performance can be generally considered satisfactory and generally in compliance with project covenants (Box 1). In spite of GoE's general skepticism as to the provision of large overseas training, vehicles and equipment procurement and technical assistance, it has been liberal with FLDP, indicating its commitment to the project, However the lack of authority given to project management and their subjection to the line department of the Ministry of Agriculture has limited project achievements in one way or another. The main difficulties in procurement, civil works and the delayed release funds are largely attributed to these factors.

Conclusion

The overall outcome of the project is considered satisfactory (Box 1). The result would have been highly satisfactory if it was not for the disappointing achievements in strengthening the field of veterinary services and sustainable drug distribution. Fortunately, however, other animal health activities have been successful as the project has provided an improved national veterinary diagnostic and investigatory service, a national veterinary Epidemiology capability and enhanced vaccine production. The project has also succeeded in introducing a forage and forage seed production technology, hence mitigating the undernourishment of working and milking animals. This has become the basis for developing modern dairy farms using improved cows and/or conditioning/fattening animals for the local markets. The forage and forage seed production technologies have completely changed the outlook of farmers, who are appreciating the advantages of farming using few improved and well fed animals and the usefulness of growing forage crops by rotating or in association with food crops. The demonstrated forage and forage seed production technologies, together with the advent of economic liberalization and peace, have opened the eyes of traditional livestock farmers. Environmentally, the project has improved large areas of degraded land, using forages, and successfully undertaken shrub control trials in the southern rangelands. Furthermore, FLDP has demonstrated the validity of organizing pastoralists into cooperatives in order to help themselves and for the project to

control services to the meat and meat processing industries and in diagnostic services to private entrepreneurs against payment.

Highlights of Lessons Learned from the project Implementation

Major lessons to be drawn from FLDP's implementation experiences and results are the following:

- Transfer of technology to local professionals and easy replicability of programmes, such as the forage and forage seed production and development and disease investigation components, found to be important ingredients for sustainability. Conversely, total dependence on public imports for inputs will prove unsustainable as demonstrated by the limited availability of veterinary drugs.
- A well-conceived and focused training program and production of extension manual and visual aids input contributed to a lasting impact on the subject programmes as demonstrated in the cases of forage development, seed production and integrated VEEU/AHRC components.
- Continuity of senior staff in Programme formulation and implementation was highly associated with successful results as shown by the animal nutrition component.
- Assigning project management responsibility to already fully engaged senior staff interfered their coordination role.
- A high level decision making body for policy guidance and for resolution of project problems was a must, particularly where the authority of project staff was limited.
- Considerable time and resources can be saved if duplicate components, such as the FMD and rabies vaccine production, are excluded from the outset. Similarly, selection of implementing agencies with limited experience and technical capabilities should be realized in order to avoid poor services such as that of AVSCO.
- Project design should make specific provision for all the activities that were necessary for the successful implementation of the project.

Further reading on the experiences and results of implementation of FLDP

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