ILCA BULLETIN

No. 2–December 1978

Livestock Development Projects

Planning and evaluation

Report of course sponsored by the International Livestock Centre for Africa (ILCA) and the Economic Development Institute of the Word Bank (EDI) held in Nairobi, Kenya, 20 March–5 May 1978

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Introduction

A Livestock Development Projects Course was held in Nairobi, Kenya from 20 March to 5 May 1978, sponsored jointly by the International Livestock Centre for Africa (ILCA) and the Economic Development Institute of the World Bank (EDI). The objective of the course was to increase the capacity of a small number of selected government officials from tropical Africa, who are responsible for livestock development, to formulate, plan, analyse and evaluate livestock development projects.

The major livestock production systems in Africa were reviewed, along with their development potentials and constraints and the impact of government policies and programmes. The greater portion of the course was then devoted to practical training in project design and formulation and the techniques of financial and economic analysis. Emphasis was placed on exercises, case studies and experience in the field, observing and analysing actual ongoing development projects within Kenya's diversified livestock sector.

This first Livestock Development Projects Course was held in English, contrary to most of ILCA's activities which cater equally for French and English speakers. Given the length and complexity of the course, simultaneous translation was thought to be impractical, particularly for interaction among the participants. The next course of this type may well be planned for French speakers.

Background of ILCA and EDI

The International Livestock Centre for Africa was established in 1974 at the initiative of the Consultative Group on International Agricultural Research to assist national efforts which aim to effect a change in production and marketing systems in tropical Africa so as to increase the sustained yield and output of livestock products and improve the quality of life of the people of this region. In pursuit of these objectives, ILCA has responsibilities in the areas of research, documentation and training. The Livestock Development Projects Course was the first major activity of ILCA's training programme.

The Economic Development Institute was established as part of the World Bank (IBRD) in 1955 to provide training in the techniques of development planning and project analysis to senior officials from developing countries which are members of the IBRD. The Institute has offered many courses over the year in various aspects of rural development, but this was the first specifically oriented to the development of livestock production.

In view of the increasing number of development projects in African countries aimed at improving the efficiency of livestock production, it seemed appropriate for these two specialized institutions to collaborate on a course to train a number of officials from these countries in the techniques of design and analysis of livestock development projects. Kenya was chosen as the venue for the course because of the facilities available in Nairobi and the large number of ongoing livestock development projects in Kenya which could be studied during the fieldwork component of the course.

Course participants and staff

Twenty-eight participants took part in this course from 16 African countries and Jamaica, W.I. These participants were senior officials from government ministries, parastatal agencies, credit institutions and other organizations directly responsible for planning, implementing, financing and appraising development projects in the livestock sector. The number of participants was kept small in order to facilitate discussion and the exchange of experiences among the group. The preliminary selection of participants was carried out at EDI headquarters in Washington, D.C., and the final selection was made by the course directors and representatives from the two sponsoring organizations.

The Course Director was Dr. Hans Jahnke in charge of economics research and now Assistant Director (Research Planning) in ILCA. Co-directors were Dr. Walter Schaefer-Kehnert, the director of EDI rural credit courses, and Dr. Solomon Bekure, a senior agricultural economist in ILCA and now head of ILCA's country programme in Botswana. Course material was prepared and sessions conducted by staff members from ILCA and the World Bank, and by consultants brought in from the University of Nairobi, the Kenya Ministry of Agriculture and from a number of ongoing livestock and range land development programmes in eastern Africa. The two course secretaries were Ms. Dorothy Knight of EDI and Ms. Regina Sokoto of the ILCA office in Nairobi.

Administrative aspects

The Heron Court Hotel provided classroom and office space for the course and living accommodations for the 28 participants. It proved advantageous in terms of efficiency and flexibility to have the classroom facilities and the living accommodations in the same building. During the period in the field, the participants were housed in hotels near the sites of the projects being studied. Transport throughout the course was provided in vehicles assigned by ILCA's Nairobi office.

A particularly demanding task was the preparation of course material, since existing teaching material from EDI was only available for about half of the topics covered by the course. A great deal of new material was produced by many different authors, which created certain editorial and organizational problems, and the printing capacity of the Nairobi ILCA office was overstretched in an effort, largely successful, to make all materials available to the participants a day or two before the appropriate sessions.

Organization of the course

The course consisted of 65 sessions, most lasting half a day. These sessions were grouped into eight general subject areas, referred to as 'seminars', each of which contributed one important aspect of the knowledge and skills which the course was meant to impart.

In fact, the seminars were not conducted one after another as presented here for two reasons: first, the logical development of the subject matter required combining inputs from different areas as the course progressed, and second, the interest of the participants was stimulated by interspersing a variety of materials and activities throughout the seven weeks of the course. The actual order in which the sessions were presented is given in the course calendar.

More than one week of the schedule was devoted to the field workshop, which was designed to give the participants an opportunity to apply under conditions as close to reality as possible the skills they had acquired during the classroom sessions. In addition to the classroom presentations and discussions and the extended field workshop, short trips were organized around Nairobi.

Table 1. *The Livestock Development Projects Course seminars.*

Seminars	Number of sessions
1. Introductory Sessions	3
2. Concepts and Techniques of Investment Analysis .	10
3. Review of Major Livestock Production Systems in Tropical Africa	14
4. Livestock Marketing and Processing	2
5. Project Identification and Formulation	6
6. Field Workshop	17
7. Project Implementation and Monitoring	5
8. Review and Choice Sessions	8
	65

The course

Seminar 1. Introductory sessions

The purpose of the introductory sessions was to familiarize the participants with ILCA and EDI, to describe the importance of livestock and its development potential in the world and in tropical Africa, and to introduce some basic theoretical concepts.

The first session presented background information on international agricultural research and an explanation of the basic mandate of ILCA. The potential role of ILCA in livestock development was described, as well as ILCA's overall programme and the function and importance of the present course. The history and basic mandate of EDI were also discussed, including the evolution from general agricultural to more specialized courses.

Estimates were given of livestock populations throughout the world, their distribution and their development in recent times. The nature of livestock production and productivity levels was emphasized, as well as the gap between production levels in developed and developing countries. A classification scheme for livestock production systems in tropical Africa was proposed as a basis for later discussion.

In the third session the essentials of economic development were emphasized, along with the role which agriculture, including livestock, plays in the development process. Several basic theoretical concepts were introduced, including the notion of 'production systems' and the 'systems approach' to research and development. These concepts were elaborated in more detail, followed by discussion of the various functions of animals in human society and the role

of animals in farming systems. The session was complemented by an evening discussion with slides on 'Agricultural and Livestock Development in Kenya'.

Seminar 2. Concepts and techniques of investment analysis

Nearly all livestock development projects involve investment, in the expectation of benefits to individuals and the national economy at a future date. Certain techniques may usefully be applied in order to plan such investments rationally and to achieve an optimum allocation of resources, given the range of investment opportunities available. These techniques include the identification of costs and benefits, the structuring of inflows and outflows associated with the investment as a stream over time, the discounting of such a stream and the application of appropriate decision criteria such as the internal rate of return and the present value.

The first five sessions on investment analysis emphasized the hypothetical and actual application of these techniques at the level of the individual farm. Compounding and discounting techniques were introduced, and different discounted cash flow measures were described and their relative merits discussed. Simple exercises were carried out, including one illustrating the ranking of development projects using different measures.

Several different farm income concepts were introduced along with their method of calculation. General accounting concepts were treated under three headings: a) annual accounts and multi-annual cash flow projections, b) farm business and farm household, and c) the rent-and-debt-free farming unit. Four farm output and income measures were then discussed: a) gross farm output, b) net value added, c) farm capital income and profit, and d) net farm income and return to labour and management. An exercise was carried out involving the calculation of different farm income measures and their interpretation.

The methodology and format of farm investment projections were examined next. The difference in phasing of inflow and outflow streams under traditional and time-adjusted formats was demonstrated and a technique was described by which a working capital stream is included in the cash flow to assure its proper timing. Two aspects of the phasing of project financing were then discussed effects on return to equity and projections of short-term credit financing. Finally, techniques were presented for computing total project costs. After this presentation, an exercise was conducted involving the computation of farm cash flows.

The concept of a development project was then elaborated and problems related to the identification and valuation of inputs and outputs at the farm level were discussed. Three sessions were spent analyzing a hypothetical dairy project, the Epitoria case study, closely modelled on a real development project. The major purpose of these sessions was to practise methods of examining the economic attractiveness of development projects from the farmers' point of view and to illustrate some of the qualitative differences between financial and economic analysis.

The second part of the seminar dealt with the evaluation of an investment from the point of view of the national economy. Here, theories and techniques are less clearly defined. The aim was, therefore, not to train the participants in any one particular approach, but rather to introduce them to several different approaches and to point out that there are aspects of macro-economic project evaluation for which they should normally request the assistance of professional economists.

First, the distinction was introduced between costs and benefits at the farm level and at the level of the economy as a whole. The rationale was discussed for differentiating between farm-level and national-level cost-benefit accounting, and some of the different methods of cost-benefit analysis (Little/Mirrlees, Squire/van der Tak, UNIDO, World Bank) were briefly described. Terms such as 'shadow prices', 'economic versus financial analysis', 'the project effects method' and 'indirect effects in cost-benefit analysis' were explained and discussed.

Next, the major principles of cost-benefit analysis and economic analysis were reviewed, with reference to the Epitoria case study, The problems of calculating the indirect costs and benefits of a development project were discussed, and a classification system and general guidelines were presented for the inclusion of indirect effects in cost-benefit analysis. Finally, in a general discussion, an attempt was made to develop a checklist which would help a government decision-maker identify and evaluate the explicit and implicit assumptions underlying the cost-benefit calculations for a development project.

Seminar 3: Review of major livestock production systems in Tropical Africa

Production systems are classified according to their principal distinguishing characteristics. In the case of livestock production systems in tropical Africa, ecological zones were proposed as the most appropriate basis for classification. It was proposed to distinguish between lowland arid and humid areas and highland areas, and to make a separate category for intensive production systems, such as pig and poultry production and intensive beef fattening, which are relatively independent of climatic conditions.

The tropical African highlands were discussed first, including their economic, social and ecological attributes. The difficulty of formally defining a highland area was pointed out, and it was agreed to define the highlands in general as areas above 1000–1500 m. A second definition was also proposed, namely that the tropical highlands are areas where high yielding plant varieties and animal breeds from the temperate zones can be successfully introduced. After these discussions, the participants saw slides on livestock production in the highlands of Kenya and Ethiopia.

One day was then devoted to a hypothetical case study of a dairy development project in Kenya. The participants learned and practised methods for making dairy herd projections, as well as farm budgeting, cash flow and related techniques. The group determined, for the case presented, the relative attractiveness to the farmer of switching from zebu to cross-bred or to pure-bred exotic cows.

Next, several aspects of livestock production in arid areas were discussed in small groups. These included ecological and land-use considerations in arid zones, an ecological and sociological assessment of pastoralism, livestock development strategies for dry areas of tropical Africa, and a comparative description of livestock production in two contrasting regions of the world (Afghanistan and Australia). The difficulty of defining arid areas precisely was recognized, although they are generally defined as areas with an annual rainfall of 600mm or less. In practical terms, dry areas can be defined as areas in which rainfall is too low or too erratic to allow cropping as the sole means of subsistence on a sustained basis.

In connection with the discussion of livestock production in arid areas, techniques were presented for making herd development calculations, and several issues and problems associated with these calculations were discussed. An exercise was carried out on the basis of an actual set of data from a ranch in Tanzania. Then range development in Kenya was described and a case study of group ranch development was presented[1]. This case study was designed to familiarize the participants with the problems of quantitative planning for pastoral development and to illustrate the important associated qualitative problems. The major socio-anthropological issues of group ranch development were also introduced.

1. A group ranch is demarcated from tribal grazing land, with the resident pastoralists designed as owners. They form a management committee, and the title deed to the ranch enables them to qualify for government loans to finance the development of water sources and other infrastructure. Format ownership is expected to confer a sense of responsibility for the long-term upkeep of the land which would include a willingness to control grazing.

After this, the environmental and economic aspects of livestock production in the humid tropics were discussed in small groups, as well as issues relating particularly to small ruminant production in these areas. An exercise was carried out focusing on the development of small stock production in the humid tropics and emphasizing the technical coefficients involved. This session was complemented by an evening slide show on livestock production in the humid tropics.

Discussions on intensive production systems began with an introduction to the role of ranches and feedlot operations in world beef production. Several aspects of ranch investment and management were discussed, including infrastructure, grazing management and feeding, and herd management. Stratified operations and the technical and economic aspects of feedlot production were also described and an exercise carried out involving the application of some of the principles discussed.

The economic importance of pig and poultry production was described both for Africa and on a worldwide basis. The technical and economic aspects of production were discussed, as well as marketing and processing at different levels of development. Three types of pig production—scavenger pig production, commercial pig production and stratified production—and four types of poultry production—farm-yard production, specialized egg production, specialized broiler production and stratified production systems—were described.

It was proposed that all livestock production systems should be described in terms of their ecological, sociological, economic and animal production aspects. The emphasis on these different aspects will vary according to their relative importance as constraints in different production systems. Thus sociological factors may be more important in the consideration of dry pastoral areas, while for intensive production systems economic aspects may be the more important concern.

Two additional considerations which are relevant to livestock production systems in specific areas are the role of wildlife and the problem of tsetse infestation. A special session was devoted to a consideration of wildlife in livestock development planning, and an experimental ranch in Kenya was described where the production of beef cattle and domesticated oryx is combined. The group visited the Nairobi National Park to observe wildlife in a protected setting and discussed present wildlife conservation and management policies in Kenya. This was

followed by a tour of the Kitengela Conservation Area and two adjoining group ranches to observe the co-existence of wildlife and livestock.

The major features and extent of trypanasomiasis in tropical Africa were outlined, along with various approaches to overcome this problem. The work of the International Laboratory for Research on Animal Diseases (ILRAD) was explained, focusing on the development of a vaccine against trypanosomiasis as well as research aimed at the control of East Coast fever. Current ILCA investigations into the use and potential of trypanotolerant livestock in tsetse-infested zones were described and an exercise was carried out to introduce the participants to the complex economic considerations involved in choosing among the various approaches to trypanosomiasis.

Finally a case study of the Upper Volta Livestock Development Project was used to discuss approaches to livestock development suitable for the ecological and sociological conditions of western Upper Volta. Trypanosomiasis is a problem in this region, which can be considered an intermediate zone between the arid and humid areas of tropical Africa. This example was used to illustrate some principles of ranch production which apply to tropical Africa in general.

Seminar 4: Livestock marketing and processing

Development in the livestock sector entails not only improvements in animal production, but also improvements in livestock transport, processing and marketing. All of these stages are involved in the delivery of livestock products to the final consumers, and in many cases improvements in transport, processing and marketing are crucial to the development of animal production. Furthermore, government interventions, affecting producer prices, production volume, the availability and quality of livestock products, the margins of middlemen, consumer prices and many other aspects of livestock production, are carried out primarily through the marketing system.

The two sessions devoted to this topic stressed the complexity of the production and marketing system. The interrelationships among the various stages are such that changes at any one level may have far-reaching repercussions. As a consequence, government interventions should be carried out with caution.

First, the major components of a livestock marketing system were outlined, with special emphasis on the problems of marketing in traditional pastoralist areas. The characteristics of actual livestock marketing systems in Africa were described, drawing on examples from the participants' countries and describing in detail the operations of the Kenya Government's Livestock Marketing Division and the private-sector livestock marketing system in Sudan. Issues involved in pricing policy were discussed, including income elasticities of demand and the price elasticity of supply, with special reference to the situation in Kenya.

In the second session, the marketing, processing and pricing characteristics of the Kenya dairy industry were discussed. This was followed by a discussion of the economic aspects of meat processing, with particular reference to the Kenya Meat Commission.

Seminar 5: Project identification and formulation

Having set out the basic concepts and techniques of financial analysis and described the livestock production and marketing systems in different settings, the next seminar was devoted to a more detailed analysis of the factors which must be considered in the identification and formulation of livestock development projects. Various approaches were described which have been followed in the design of agricultural development projects in the past, and the economic factors which should be considered, such as production functions and price ratios, were discussed. It was stressed that the social impact of a project must also be carefully gauged, particularly since the active participation of the local population is necessary to ensure any project's success. Finally, the operational steps involved in identifying and preparing a project were discussed. The purpose of these sessions was to alert the participants to all the factors which must be considered and to explain the actual procedures which are followed in designing development projects.

As the process of project identification and formulation does not adhere to strict scientific procedures, the seminar was opened with a case study, based on the development of the livestock sector in Ethiopia. An overview of the Ethiopian agricultural sector was presented, followed by an outline of the history of livestock development in the country and background information on the Rangeland Livestock Development Project. The scarcity of quantitative information about the rangelands and the lack of trained local staff were identified as constraints which have been only partially relieved over time.

Next, the project approach to agricultural development was introduced in more general terms. The characteristics of industrial, infrastructural, agricultural and rural development projects were described and the history of the World Bank's participation in financing agricultural projects was outlined. It was pointed out that the design of rural development projects can be approached on a regional, sectoral or a functional basis. An assessment should always be made of the political, social and economic implications of a development project, and design features should be incorporated which are conducive to good project performance. Consideration should also be given to the implications of new development projects for the existing structure of public administration in the agricultural sector.

In a discussion of economic choices in livestock and crop farming, the characteristics of subsistence and commercial farming were outlined, along with the rationale for diversification and specialization. Several features of modern biological, chemical, mechanical and organizational technologies were described, and their applicability discussed for farms of various sizes. The economic principles were described which determine factor allocation in the farm decision-making process, including the relevant physical relationships and production functions.

Then the current level of crop prices, animal product prices and farm input prices in the participants' home countries was reviewed, which led to a discussion of factor-product price ratios and the optimal intensity of production. This was followed by an explanation of the use of price ratios to determine the minimum-cost combination of production factors and the selection of enterprises based on product prices. An exercise was carried out to demonstrate the use of price ratios in project planning.

A separate session focussed on the importance of traditional socio-economic factors in the successful planning and formulation of rural development projects. The proverb 'You can lead a horse to water, but you can't make him drink' was used to illustrate the fact that the success of even the most carefully planned development project ultimately depends upon its acceptability

to the people who are expected to participate. The notion of development planning is foreign to many traditional societies, so that projects must be planned carefully if they are to attract the active participation of the local people. It was proposed that human societies should never be considered in isolation from the environment they inhabit, nor the environment considered in isolation from the society. An approach to project planning and implementation was advocated which would involve setting up and implementing small pilot projects in the field and at the same time planning a large-scale project in stages on the basis of actual field experience.

Finally, the cycle of project identification, preparation, appraisal, implementation and ex-post evaluation was discussed. A more detailed description was given of the stages of project identification, preparation and formulation, to include: a) determining the scope and timing of a project, b) selecting appropriate technologies, c) estimating total project costs, d) proposing adequate project financing, e) designing the project organization and staffing and f) arranging for the procurement of inputs and the marketing of produce.

Seminar 6: Field workshop

The main objective of the field workshop was to give the participants an opportunity to put the knowledge and skills they had gained from the classroom sessions into practice. Small groups were formed to formulate and analyse actual livestock project proposals. Seven projects were selected from the variety of livestock development projects under consideration in Kenya, and the participants were divided into seven teams of four, each accompanied by one or two staff consultants.

The groups spent one week in the field visiting the selected project sites and also making short visits to similar ongoing projects to broaden their perspective. By interviewing farmers, project managers, agricultural officers, researchers, credit officers and other field workers, the teams were expected to extract sufficient technical, financial and economic data to appraise the feasibility of the projects they were considering, applying the techniques of project analysis discussed in the classroom sessions. Recognizing that the time in the field for information gathering was limited, background material on the projects was made available to the participants in the course library.

An outline was provided for the participants to follow when gathering information and preparing their project reports. This was to ensure that all essential aspects of the project appraisal would be included. These were: a) the purpose and background of the project, b) a description of the ecology, the infrastructure and the socio-economic conditions of the project area, c) detailed features of the project, including its scope and phasing, production methods, technical requirements, cost estimates, proposed financing and operating results, d) the organization and management of the project, including staffing, e) procurement and marketing considerations, f) projected benefits and g) conclusions and recommendations.

In order to expedite the work of the teams, project preparation activities were divided among team members and each member was made responsible for the analysis of one specific aspect of the project. Team members were expected to work closely together, however, in formulating the basic hypotheses and strategies to be followed and in exchanging information and providing feedback for each member's work. On returning from the field, the teams spent two days preparing their project reports and a further two days presenting oral and written reports to the whole group for comments and criticism. During the presentation of the written reports, a second team assumed the role of the appraisal committee of a credit institution or planning

agency and led the discussion by asking questions and giving comments to the team presenting its report.

The seven livestock development projects which the participants analysed were:-

1. Small-Scale Dairy Development—Kisii District, Nyanza Province

2. Group Ranch Development—Narok District, Rift Valley Province

3. Company Ranch Development—Taita District, Coast Province

4. Grazing Block Development—Isiolo District, Eastern Province

5. Broiler Production Development —Environs of Nairobi

6. Small-Scale Pig Production—Nyeri District, Central Province

7. Beef Fattening—Nakuru District, Rift Valley Province.

Small-scale dairy development

The first team of participants had as its objective the preparation of a dairy development project to increase milk production on small farms in a densely populated high-potential district of western Kenya. The main constraints on production were identified as the irregular availability and high cost of inputs and limited land available for grazing; marketing was not found to be a constraint because of high local demand. Credit facilities are already available to farmers through the Agricultural Finance Corporation for the purchase of grade cattle, fencing material and dairy equipment.

The team concluded that a dairy development project in the area should include the upgrading of zebu cattle through artificial insemination, the encouragement of fodder production and stall feeding, and the development of the dairy extension and artificial insemination services. Farmers would be provided with seeds and fertilizer for fodder production, and extension and technical services would be increased.

Cashflow projections were made for a 10-year period, and it was found that, for fodder production and stall feeding to compete financially with alternative land uses, farmers would have to possess high-yielding cows and rely almost entirely on family labour. Benefits would accrue to farmers and to local consumers, who would have access to an increased milk supply. The cost of increasing government services would be borne by the national economy.

Dr. Solomon was the staff consultant for this team, and Mr. J. M. Nyagah, the Kisii District Land and Farm Management Officer, was the principal co-operating officer in the field.

Group ranch development

The second team concentrated on a 4000hectare group ranch in one of Kenya's major rangeland areas. The team's objective was to design a ranch development project which would increase livestock productivity and income through an enhanced offtake rate.

Investment and operating expenses were projected for a 10-year period for the medium-size ranch under study, and hypothetical projections were also made for a much larger ranch in order to provide figures which would be relevant for most group ranches in the district. These funds would be used for the improvement of water supplies, the construction of roads, firebreaks and buildings, the purchase of pedigree bulls, machinery and equipment and the salary of a full-time resident ranch manager. The investments would be financed through short- and long-term loans provided by the Agricultural Finance Corporation, to be repaid periodically by the ranch whenever a group of fattened steers were sold, and annually by individual members according to the number of stock units maintained on the ranch. A substantial internal rate of return was projected, with benefits accruing to the ranch members in the form of increased incomes from livestock sales and to the national economy in terms of increased livestock production for the domestic and export markets. The staff consultants were Mr. Ole Pasha and Dr. Litzka, and the principal co-operating field officer was Mr. F. Chesumbai, the Narok District Ranch Planning Officer.

Company ranch development[2]

2. Company ranches in Kenya are demarcated on formerly unused government land. Capital for the purchase of stock and development of infrastructure is raised by the sale of equity shares and government loans. Beef production is carried out on a commercial basis under the supervision of a salaried resident ranch manager.

The third team consulted with company ranch managers and agricultural and lending officers in Taita District, where commercial beef ranching is being encouraged by the Kenya Government. The team constructed a company ranch model and analysed its financial viability, as well as the overall economic, social and ecological implications of commercial beef ranching in the area.

A company ranch of 40.000 ha was projected with a carrying capacity of 4.000 animal units. Capital investment would include the construction of dams, roads and firebreaks, and the purchase of fattening steers and breeding heifers. All working capital plus 80% of investment capital would be provided by the Agricultural Finance Corporation from funds available to the second Kenya Livestock Development Project. The remaining 20% of investment capital would be provided by the sale of equity shares.

The economic rate of return was projected for a 21-year period, and it was found that the project was not financially viable as planned. A wide variation in profitability could be expected from the adoption of different production systems, as well as from external factors such as drought, the availability of immature steers and the producer prices obtained for finished animals from local butchers or the Kenya Meat Commission.

Private investors would receive a low rate of return and few benefits would accrue to the local population because employment generation would be limited. If, nevertheless, company beef ranching in this area is considered necessary in terms of national beef production targets, then the team concluded that its development should be considered under special loan terms or direct subsidy.

Dr. Wales and Mr. Rono were the staff consultants for this project.

Grazing block development[3]

3. A grazing block is a delimited pastoral area where formal land tenure reform is not proposed for the immediate future, but where some investment is made in improved water sources and other infrastructure. A system of rotational grazing is designed and overseen by a government grazing manager.

A grazing block development project was formulated and appraised by the fourth team of participants, designed to increase livestock production and offtake in one of Kenya's pastoral areas through the provision of watering points and the institution of a wet/dry season deferred grazing management system. The team concentrated on one grazing block with the hope of developing a model which would be relevant to other blocks in Isiolo District.

The cost and benefits of the project were projected for a 10-year period. Investment and operating costs would be provided by government throughout the period to cover the purchase of vehicle, the salaries of a block manager and two assistant managers, and the construction and maintenance of boreholes, water pans, tracks, staff houses and an office. Benefits in the form of increased offtake for sale and domestic consumption, would accrue to the graziers, giving an internal rate of return on the investment of 8% per annum. It was proposed that the government's contribution should be financed in part by fees charged to the graziers for watering rights and veterinary services and by a tax on all animals sold from project area.

Mr. Stephen ole Timoi, the Isiolo District Range Officer, was the principal co-operating field officer, and staff consultants were Dr. Nissen and Dr. Bille.

Broiler production

The objectives of the team studying broiler production were to review the existing data on the supply and demand of broilers in Kenya, to make demand projections up to 1990, and on the basis of these projections to design a scheme for increasing the production of broilers in four project areas, primarily among small farmers.

Between 1971 and 1976, the consumption of broilers in Kenya grew at a rate of 5.9% per annum. There is evidence that the supply of local poultry to urban centres is declining and that there is a corresponding rise in demand for broilers.

Constraints on increased production centre around the quality and cost of feeds, underdeveloped market channels, a limited number of extension workers specializing in poultry production, and an inadequate level of technical knowledge among small farmers.

The project was planned in three phases covering a period of 13 years. The main investment items would be poultry buildings, equipment, feed and day-old chicks. The participating farmers would provide 20% of the required capital and the remaining 80% would be financed as credit through the Agricultural Finance Corporation and other lending agencies. The cashflow analysis revealed substantial internal rates of return.

Farmer training and technical advice would be handled by existing government extension services, and the team recommended that a marketing agency be set up to ensure a reliable market for small-scale producers. Benefits would accrue to farmers in the form of increased incomes, to local consumers by meeting their increasing demands and to the national economy in terms of increased export earnings. Assuming the present export level of 5% of total production, the project would generate around K.Shs 3 million in foreign exchange by 1990.

Mr. H.E. Tan, a poultry expert with the Kenya Ministry of Agriculture, was the principal co-operating officer, and Dr. Anderson was the staff consultant for this project.

Small-scale pig production

The team which prepared a small-scale pig production project consulted with agricultural and loan officers in one of Kenya's high-potential agricultural districts, with managers of the local feed supply company and bacon factory, and with local pig farmers. The team's objectives were to assess how pig production fits into the small-scale farming system and to design a project to increase the production of pigs.

Despite generally favourable conditions in Nyeri District, several constraints to increased pig production were identified, including poor animal housing, poor management and high transport costs. In light of these constraints, the project proposed to provide training and technical services, to local pig farmers, to improve the transport and distribution of feeds, and to provide credit facilities to small farmers for the purchase of improved breeding stock, the renovation or construction of sties and the purchase of feed and farm equipment.

Costs and benefits were projected for the first phase of the project, covering a 10-year period. The costs would be financed by credit to the Kenya Government for onlending by the Agricultural Finance Corporation to individual farmers. The benefits would accrue to the participating farmers and to the bacon factory, which is at present undersupplied. An internal rate of return for the project was projected at 10%.

The staff consultants for this project were Dr. Sutherland and Mr. Chabari, and the principal co-operating officer in the field was Mr. Peter Njuguna, the District Animal Husbandry Officer.

Beef fattening

The last team of participants investigated the economics of feedlot operations in Kenya and prepared a small-scale and a large-scale feedlot model for Nakuru District with different projected levels of annual throughput. The investment and operating costs of both models were projected over a 10-year period, covering the purchase of agricultural machinery and equipment, wages, the purchase of steers for fattening and the cost of animal feeds. The bulk of these costs would be covered by loans from the Agricultural Finance Corporation, and the finished steers would all be sold to the Kenya Meat Commission, largely for the export market.

Benefits would be affected by several external factors, including the export parity price of maize, the availability and procurement price of steers and the grades and prices set by the Kenya Meat Commission. Considering all these factors, it was concluded that a capital-intensive feedlot could be a viable investment with a minimum throughput of about 3.000 steers per annum. A much lower internal rate of return would be achieved by a small-scale feedlot operation. Benefits would accrue to the feedlot owners, to the Kenya Meat Commission which would obtain a regular supply of high-grade carcasses, and to the national economy in the form of foreign exchange earnings.

Mr. Alfred Mburung'a, the Assistant Branch Manager of the Agricultural Finance Corporation, was the principal cooperating officer in the field, and government officers, feedlot managers and

officers of the Kenya Meat Commission were also consulted. The staff consultant was Dr. Schaefer-Kehnert.

Seminar 7. Project implementation and monitoring

The preparation of a project appraisal report is normally followed by implementation of the project, monitoring and finally ex-post evaluation. Network planning was introduced as a useful method for organizing and controlling the implementation of development projects, and in particular the technique of Analysis Bar Charting (ABC) and a simplified Critical Path Method (CPM). Two exercises were carried out to familiarize the participants with Analysis Bar Charting, one based on familiar household routines and the other derived from a dairy development scheme in India, and a film was shown on critical path use, produced by the British Productivity Council. The participants then formed seven teams to carry out a network planning exercise using the Epitoria Case Study.

The time devoted to discussion of project implementation was purposefully limited, because, although all sorts of implementation problems occur in practice, most of these are specific to individual development projects, and only a few aspects lend themselves to formal classroom presentation. Using example of livestock development projects in Ethiopia, the practical problems of starting up and implementing a development project were discussed from the point of view of the host country. Several aspects of project implementation were mentioned, such as the political and institutional environment, the internal organization of the project, the recruitment of staff, reporting methods, financial accounting and reimbursement procedures. After a discussion, the problems of project implementation were described from the donor agencies' point of view. The participants then discussed their own experiences with project monitoring and an approach to monitoring was described which has been developed by ILCA.

An exercise was carried out next, in which each team of participants developed a monitoring proposal for its field workshop project, and these were presented for group discussion. This was followed by a presentation of some basic principles of data collection and statistical analysis appropriate for project monitoring, using as an example ILCA's monitoring exercise in Kenya. In a summary of the World Bank's experience with livestock development projects, it was pointed out that the returns to projects in the livestock sector are often over-estimated in the early stages of project design and the actual results vary widely, especially when compared to the results of projects in other sectors.

Seminar 8. Review and choice sessions

The sessions described here were heterogeneous, designed to fulfill a variety of purposes. When the participants first arrived in Nairobi, the background and objectives of the course were described, as well as its overall organization and the proposed sequence of sessions, based on experiences from other EDI courses. The field workshop was explained, along with administrative matters and various issues of concern to the participants. At this time, the participants were given Sharp E1— 8131 Lesimate electronic pocket calculators, and their use was explained.

In the middle of the course, one session was devoted to a midcourse review. Topics that had already been covered were discussed in order to identify specific areas which should be repeated or expanded during the two choice sessions scheduled for the final week. Evaluation

sheets completed by the participants were discussed, along with administrative and organizational matters, in particular the supply of reference materials.

The two choice sessions focussed on topics chosen by the participants. First, the essential elements of farm investment projections were reviewed, including the most useful formats and the techniques for making an internal rate of return calculation. Guidelines were given of practical approaches to farm investment projections. The second choice session started with the principle of opportunity costing from the micro and macro-economic point of view and reviewed the difference between financial and economic analysis. An explanation was given of the principles of shadow pricing, together with the essential aspects of some of the most widely used methods of social cost-benefit analysis. Exercises were carried out to illustrate the techniques discussed during these session.

During the final days of the course, a computerized model used for herd projections was introduced, and a herd projection exercise carried out using electronic calculators. One session was also devoted to a discussion of ILCA's training philosophy and the major components of the training programme.

Short evaluation sheets were completed by the participants on a weekly basis, and a more substantial evaluation was carried out at the end of the course. Participants were asked to consider the different types of sessions such as lectures, exercises and the field workshop, and the general subjects covered, to determine which topics and which types of sessions might have been allocated too little or too much time and which other subjects might have been added or eliminated. They indicated how much of the reading they were able to complete, and assessed the usefulness of the field workshop and other field trips. They were asked to comment on the organization of the course, the specific techniques they felt they had mastered and other benefits they had derived. These issues were discussed during the evaluation session.

Evaluation

The objective of the Livestock Development Projects Course was to improve the capacity of a small number of selected government officials from tropical Africa to formulate, plan, analyse and evaluate livestock development projects. It follows that the success of the course depended in large measure on the calibre of the participants selected, as well as on the suitability of the course curriculum and the effectiveness with which it was presented. This success can only be determined ultimately in terms of the enhanced job performance of the participants. However, it is possible to make some initial assessment in terms of the response of the participants and the impressions of the course directors.

A great deal of information was presented in a short period of time, much of it highly technical, to a group whose background in economics and in the biological sciences varied widely, so that problems in choosing the appropriate course content and level of presentation was inevitable. As the background of the participants was not uniform, some time had to be spent bringing them all up to the same level.

In general, the participants felt that the material presented during the course was well chosen and that the correct amount of time was devoted to the various topics covered. A number did

feel that more time could have been spent discussing the economic evaluation of projects, network panning techniques and project implementation and monitoring. Their assessment is given in Table 2.

When asked about the different types of presentations, the participants felt that about the right amount of time had been devoted to lectures, case studies and discussions, but 11 felt that more time could have been spent on exercises and 20 felt that more time could have been devoted to the field workshop.

A great deal of reading was assigned for the course, and many participants found it difficult to read all the material with sufficient thoroughness and to absorb fully all the concepts and information which were then discussed during the sessions. Five of the participants responded that they had been able to complete almost all of the reading assigned, 16 completed most of the reading, and 6 reported completing a fair part (20–50%). This situation would have been improved if the course organizers had been able to prepare and distribute the background reading further in advance of the sessions.

Table 2. *Participants' views on the time devoted to various topics covered by the course.*

Topic	Time allocated		
	Too much	About right	Too little
Introductory sessions	2	25	0
Concepts and techniques of investment analysis	2	18	7
Economic evaluation of Projects	2	10	15
Review of major livestock Production systems in tropical Africa	4	20	3
Herd projections	3	17	7
Livestock marketing and processing	1	20	6
Project identification and formulation	2	17	8
Network planning techniques	1	16	10
Project implementation and monitoring	2	14	11
Review and choice sessions	–	–	–

Note N=27

The participants agreed that the field workshop was relevant to the course and useful to them, but some of them felt it could have been better organized. They all felt the shorter field trips were well selected and instructive. They were also asked to evaluate the administration of the course, including such factors as precourse correspondence and travel arrangements, accommodations, financial arrangements, quality of the course material, timely handing out of the course material and return travel arrangements. As expected, about half of the participants mentioned that the course materials could have been distributed further in advance, but they felt that all the other organizational arrangements were satisfactory.

The course curriculum contained a balance of general information about livestock production systems and training in specific techniques of project analysis. The participants felt that they benefited directly from both of these aspects of the course. They were asked in detail about

three techniques which were covered—internal rate-of-return calculations, herd projections and network scheduling. Their responses are given in Table 3.

Table 3. *Responses concerning training in specific techniques.*

Responses	Techniques		
	Internal rate of return	Herd projections	Network scheduling
Could do it to some extent before course	11	18	10
Learned it during course	12	11	12
Can now do it by myself	15	10	9
Still need some help	1	2	4
Expect to apply it in my job			
often	15	16	15
occasionally	11	9	15
never	–	–	–
Subordinates will apply	8	14	9

Note: N = 27; multiple responses allowed.

The participants all counted as indirect benefits their increased familiarity with ILCA and EDI and the value of making contact with professional colleagues from other countries. They felt they had benefited from sharing their knowledge and experience, and they all planned to stay in contact with each other. They all felt that the course had met, or even exceeded, their expectations, and that, knowing what they did about the course, they would still apply.

From the point of view of the course directors, the professional competence and the level of commitment shown by the participants were very impressive. In many discussions, the directors and staff members of the course benefited as much as the participants from the views expressed and experiences shared, which was altogether in keeping with the spirit of the course as planned from the outset.

The perceived need for such a course was clearly demonstrated by the large number of applicants who responded to the initial announcement. The directors felt that the administrative and other problems which invariably occur were successfully overcome and that the basic objectives of the course were attained.

This course represented EDI's first effort to conduct training at such a specialized, technical level. This approach was considered successful, and the participating staff from EDI plan to conduct more courses of this type in collaboration with other organizations which can complement EDI's areas of specialization with the appropriate technical expertize.

For ILCA, this course represented the first major training activity of a young organization. A great deal of instructional material was developed which can be used for a variety of future training efforts, and this course should also serve as a demonstration to other national and international institutions which might wish to undertake similar training exercises. Experiences

can be shared, and the course material can be made available to other organizations on request.

Course notes and exercises

Extensive written materials were used during the course which can be categorized as course notes, exercises and case studies, and supplementary materials. Some of these materials were produced in Nairobi specifically for this course, and these are listed here as LDPC course notes and exercises. Copies of these papers may be obtained from the International Livestock Centre for Africa, P.O. Box 46847, Nairobi, Kenya. Another major source of course material was the collection of course notes, exercises and case studies prepared through the years by EDI. These are listed here as EDI materials and may be obtained from the Economic Development Institute of the World Bank, 1818 H. Street, N.W., Washington, D.C. 20433, U.S.A. Books, journal articles and other published materials were also used.

Notes prepared for the course

Number	Author(s)	Title	Session number(s)
LDPC-CN 1	H.E. Jahnke	Livestock and livestock production in the world and in tropical Africa (12 pp)	1.2
LDPC-CN 2	H.E. Jahnke	Livestock production systems in tropical Africa (14 pp)	1.2
LDPC-CN 3	P. Hopcraft	The role of agriculture in economic development (5 pp)	1.3
LDPC-CN 4	H.E. Jahnke	Role and functions of livestock (3 pp)	1.3
LDPC-CN 5	P. Hopcraft	The integration of livestock into farm production systems (6 pp)	1.3
LDPC-CN 6	H.E. Jahnke	Livestock in economic development (1100 pp)	1.3
LDPC-CN 7	H. Ruthenberg	Selected statistics on agricultural development in Kenya (4 pp)	1.3
LDPC-CN 10	H. Ruthenberg and N.E. Jahnke	Indirect effects in project analysis (20 pp)	2.10
LDPC-CN 11	H. Ruthenberg	Checklist for the evaluation of cost-benefit calculations (1 p)	2.10
LDPC-CN 12	J.C. Bille	Ecology and ecosystems of the highlands of tropical Africa (8 pp)	3.1
LDPC-CN 13	S. Marples	Livestock production in the Highlands of tropical Africa (7 pp)	3.1
LDPC-CN 14	P. Hopcraft	Elements of a dairy development strategy (8 pp)	3.1
LDPC-CN 16	D. Stotz	The development of small holder dairying in Kenya (32 pp)	3.2 3.3
LDPC-CN 17	J.C. Bil!e	Ecology and Land use in the arid zones of tropical Africa (8 pp)	3.4
LDPC-CN 18	S. Marples	Livestock production in the dry area of Asia: a comparative look at Afghanistan (11 pp)	3.4
LDPC-CN	H. Eidheim	Adaptations of pastoral management units	3.4 3.63.7

1100		to changing circumstances: a sociological assessment with particular for development planning (8 pp)	
LDPC-CN 20	M. Norton-Griffiths	Strategies of rangeland exploitation: an ecological assessment of pastoralism (4 pp)	3.4
LDPC-CN 21	H.E.Jahnke and H. Ruthenberg	Livestock development strategies far the dry areas of tropical Africa (summary of published article) (1 p)	3.4
LDPC-CN 22	H.E. Jahnke	Livestock production in the dry areas of a developed country: a comparative look at Australia (6 pp)	3.4
LDPC-CN 23	H.E. Jahnke	An historical view of range development in Kenya (12 pp)	3.6 3.7
LDPC-CN 24	J. Helland	An anthropologist's view of group ranch development (12 pp)	3.6 3.7
LDPC-CN 25	J.C. Bille	The environment in the humid zones of tropical Africa (7 pp)	3.100
LDPC-CN 26	V.A. Finch	The effects of climate on energymetabolism of cattle: a physiological basis for prediction of productivity in the tropics (10 pp)	3.100
LDPC-CN 27	C. de Haan	Small ruminant production in the humid zones of tropical Africa (8 pp)	3.100
LDPC-CN 28	H. Croze	The consideration of wildlife in live-stock development planning (10 pp)	3.10
LDPC-CN 2100	M. Stanley-Price	An experiment in wildlife domestication (5 pp)	3.10
LDPC-CN 30	D. Mbuvi	Wildlife conservation and management in Kenya's development (7 pp)	3.10
LDPC-CN 31	ILCA	Progress report on investigation into the use and potential of trypanotolerant livestock (4 pp)	3.11
LDPC-CN 32	H.E. Jahnke	Approaches to the tsetse and trypanosomiasis problem (4 pp)	3.11
LDPC-CN 33	K. Meyn	Poultry production - lecture notes (17 pp)	3.13
LDPC-CN 34	M. Wales	Livestock marketing in Sudan: a project proposal (15 pp)	4.1
LDPC-CN 35	M. Wales	Livestock marketing systems (10 pp)	4.1
LDPC-CN 36	P. Hopcraft	Prices: Their formation and economic role (8 pp)	4.1
LDPC-CN 37	J. White	The role of the Livestock Marketing Division in cattle marketing in Kenya (14 pp)	4.1
LDPC-CN 38	M. Wales	Livestock marketing systems check list (1 p)	4.1
LDPC-CN 3100	P. Hopcraft	Some economic considerations in dairy pricing: the Kenya case (14 pp)	4.2

LDPC-CN 40	T. Aldington	Livestock processing (13 pp)	4.2
LDPC-CN 41	N. Cossins	Watering Horses: the relevance of socio-economic factors to the planning and design of livestock and pastoral area projects (27 pp)	5.5
LDPC-CN 43	L. Ngutter	A note on socio-economic factors in livestock project design (5 pp)	5.5
LDPC-CN 42	Solomon Bekure	Introduction to network planning (20 pp)	7.1
LDPC-CN 44	H.E. Jahnke	Monitoring livestock development schemes: The approach of the International Livestock Centre for Africa (ILCA) (7 pp)	7.4
LDPC-CN 45	F. Litzka	Some considerations on statistics and data collection (11 pp)	7.5
LDPC-CN 46	T. Sutherland	ILCA training (13 pp)	8.7

Exercises prepared for the course

LDPC-E 1	Solomon Bekure	Exercise on the use of the Sharp EL-8131, Elsimate electronic calculator (100 pp)	8.2
LDPC-E 2	Solomon Bekure	Compounding and discounting exercises: problem and solution sets (21 pp)	2.1
LDPC-E 3	D. Stotz and H. Ruthenberg	Smallholder dairy development project in Kenya: problem and solution (23 pp)	3.2
LDPC-E 4	M. Wales	Group ranch case study: problem and solution (14 pp)	3.6
LDPC-E 5	C. de Haan	Small ruminant production in the humid tropics (8 pp)	3.100
LDPC-E 6	H. E. Jahnke	The economics of alternative approaches to the tsetse and trypanosomiasis problem: problem and proposed solutions (8 pp)	3.11
LDPC-E 8	Solomon Bekure	Project wake up - go to work: a net-work planning exercise (6 pp)	7.1
LDPC-E 100	Solomon Bekure	Starting a dairy development scheme: a network planning exercise (7 pp)	7.1
LDPC-E 7	Solomon Bekure	Network planning exercise: Epitoria dairy development project case study (2 pp)	7.2
LDPC-E 11	W. Schaefer-Kehnert	Farm income analysis and investment projection exercise (2 pp)	8.4
LDPC-E 12	H.E. Jahnke	Economic analysis exercise (3 pp)	8.5
LDPC-E 10	N. Nissen	Herd Projection exercise using HP67 or HP1007 calculators (7 pp)	8.6

Other papers prepared for the course

LDPC-Misc. 1	K. Meyn	Constraints of beef production in Africa—breeding aspects (11 pp)	3.12

LDPC - Misc. 2	Kenya, Ministry of Agriculture	Excerpts on poultry production from 'second smallholder agricultural credit project', 110071 (10 pp)	3.13

EDI course notes

CN-30 Rev. Jan 77	W. Schaefer-Kehnert	How to start an internal rate of return calculation (5 pp)	2.2
CN-7 Rev. Mar. 77	W. Schaefer-Kehnert	Farm output and income measures (7 pp)	2.3
CN-8 Rev. Jan. 7$	W. Schaefer-Kehnert	The phasing of inflow and outflow in farm cash flow projections (16 pp)	2.4
CN-31 Rev. Aug. 77	C.T. Espadas	Herd projection using Hewlett-Packard 67 calculator (23 pp)	3.5
CN-4100 Feb. 78	W. Schaefer-Kehnert	Economic aspects of intensive beef production in a developing country (11 pp)	3.12
CN-50 Apr. 78	K. Meyn	Ranching in Kenya - fattening of steers or cow-calf operation? (6 pp)	3.12
CN-57 (T) April 78	EDI	Development of an integrated poultrycomplex in Kenya (11 pp)	3.13
CN-6 Rev. Mar. 77	W. Schaefer-Kehnert	Principles of agricultural production economics (10 pp)	5.3
CN-48 Feb. 78	W. Schaefer-Kehnert	Agricultural production economics (10 pp)	5.3
CN-47 Feb. 78	W. Schaefer-Kehnert	Checklist for the preparation of agricultural projects (2 pp)	5.6

EDI case studies and exercises

AE-1042 Rev. Aug. 75	J. P. Gittinger	Discounted cash flow exercises: problem and solution sets (1100 pp)	2.2
AE-1076 Rev. Mar-77	W Schaefer-Kehnert	Farm output and income measures: calculation exercise (100 pp)	2.3
AE-1108 Jan. 78	W. Schaefer-Kehnert	Farm cash flow projection exercise: problem and solution (10 pp)	2.4
AC-174-R Jan. 78	W. Schaefer-Kehnert	Epitoria dairy development project: preparation report (81 pp)	2.62.72.8
AC-1 74-P,S Jan. 78	W. Schaefer-Kehnert	Epitoria dairy development project: problem and solution (56 pp)	2.62.72.8
AE-101007 Rev. Jan. 78	W. Schaefer-Kehnert	Herd projection exercise—Tanzania ranch (8 pp)	3.5
AE-101000 Jul. 76	J. P. Gittinger and W. Schaefer-Kehnert	Kenya feedlot exercise (10 pp)	3.12
AC-175-R	W. Schaefer	Ethiopia: development of the livestock	5.1

Jan. 78	Kehnert, F. Thornley, L. Brown, C. Chisholm and E. Root	industry - sector survey report (110 pp)	
AE-107100 Rev. Apr. 78	W. Schaefer-Kehnert	The use of price ratios as choice indicators (10 pp)	5.4

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