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Appraisal of Livestock Development Project Nigeria

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CURRENCY EQUIVALENT

1 Naira (₦)	=	100 Kobo (K)	= US$1.52 1/
1 US$	=	100 Cents(¢)	= ₦0.658

WEIGHTS AND MEASURES

1 acre (ac)	=	0.405 hectares (ha)
1 mile (mi)	=	1.61 kilometers (km)
1 inch (in)	=	25.64 millimeters (mm)
1 cubic foot (cu ft)	=	0.03 cubic meters (m3)
1 pound (lb)	=	453.6 grams
1 hundredweight (cwt)	=	112 pounds
1 long ton	=	2,240 lb = 1.016 metric ton
1 gallon	=	3.79 liters
1 pound	=	0.454 kilogram

ABBREVIATIONS

FLD = Federal Livestock Department
FMANR= Federal Ministry of Agriculture and Natural Resources
HEU = Heavy Equipment Unit
LPU = Livestock Project Unit
NAB = Nigerian Agricultural Bank
NC State = North Central State
NE State = North Eastern State
NELC = North Eastern Livestock Company
NLPC = National Livestock Production Company
NW State = North Western State
USAID = United States Agency for International Development
WLC = Western Livestock Company
W State = Western State

FISCAL YEAR

April 1 - March 31

1/ Since April 1, 1974 the Naira has floated independent of the U.S. dollar. Twice weekly, the Central Bank sets buying and selling rates for the U.S. dollar and £ sterling. The Naira has appreciated steadily vis-a-vis the U.S. dollar, and by July 1, 1974 the average quotation was ₦ 1 = US$1.622 or 6.7 percent above the previous central rate of ₦ 1 = US$1.52. The latter has been used for currency conversions throughout this report.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

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NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

SUMMARY AND CONCLUSIONS

i. This report appraises a project that would introduce improved methods of beef cattle production in the Western, North Eastern and North Central States of Nigeria. The beef cattle industry remains largely in the hands of nomadic graziers and changes in the traditional methods are necessary if productivity is to be significantly expanded. Domestic production now supplies only about 70% of domestic consumption, the remainder being met by imports. Demand has risen fast in recent years and is expected to double by 1980.

ii. The proposed project would (a) establish or improve seven breeding and two fattening ranches owned by Federal and State Government companies; (b) provide credit and technical support for commercial farmers to establish about 50 medium-sized breeding and fattening ranches and for up to 1,500 smallholders to take up fattening; (c) establish for about 1,500 nomadic herdsmen and their families some 1,600 sq mi of grazing reserves, appropriately equipped and staffed; (d) establish and carry out pasture improvement research programs; and (e) provide training in beef cattle production for Government employees, private ranchers, smallholders and herdsmen.

iii. The project would provide the funds needed to build up breeding herds totalling about 100,000 head, improve about 21,000 ac of pasture, build 100 dams for watering cattle, and construct 2,000 miles of roads and firebreaks.

iv. A Livestock Project Unit (LPU) would be set up in the Federal Ministry of Agriculture and Natural Resources to coordinate project implementation and to (a) prepare development plans for the Federal, State and privately owned ranches; (b) operate, as agent for the Nigerian Agricultural Bank (NAB), the credit scheme for beef cattle fattening by smallholders; (c) provide technical supervision of borrowers for these ranches on behalf of NAB; (d) develop and manage the grazing reserves; and (e) be directly responsible for training and research and for pasture seed production. NAB would be the credit channel for ranch development loans; loans to smallholders for cattle fattening would be made by LPU on behalf of NAB. Consultants would be appointed to make regular evaluations of project progress, and to carry out project-related studies.

v. Total project cost is estimated at US$42.0 million over an investment period of eight years. A Bank loan of US$21.0 million is proposed, which would cover the project's foreign exchange costs which amount to 50% of project costs. The remaining project costs would be financed as follows: Federal Government 14%, State Governments 19%, NAB 12% and private ranches and smallholders 5%.

vi. The Borrower would be the Federal Government, and the loan would be made for a term of 20 years, including a grace period of six years on principal. The Bank loan, together with a Federal Government contribution

of N 3.9 million (US$5.9 million), would be deployed as follows: the Borrower would on-lend N 8.6 million (US$13.1 million) to NAB, which in turn would lend to the ultimate borrowers at an appropriate interest rate varying between 5% and 9-1/2%. Of the balance: N 1.1 million (US$1.7 million) would be passed on to the North East and North Central States as grants in aid for its development of the grazing reserves; N 4.4 million (US$6.7 million) would meet the costs of the Livestock Project Unit; N 0.5 million (US$0.8 million) would be invested as equity in the federally owned ranching company; and, N 3.0 million (US$4.6 million) would remain to be allocated.

vii. The procurement of vehicles, earthmoving and other equipment, housing and fencing wire (US$4.7 million) would be by international competitive bidding, for all contracts in excess of US$25,000. Domestically manufactured goods would be allowed a preference of 15 percent or the prevailing customs duty whichever is lower; bids by eligible domestic contractors would be allowed a preference of 7-1/2 percent. All other procurement of equipment for the State-owned ranches (US$1.3 million) would be through locally advertised competitive bidding procedures, except for small items which would be purchased directly. Livestock purchases for the State-owned ranches (US$5.8 million) would not be subject to international competitive bidding because the project requires cattle suited to local conditions that can only be obtained through the traditional trading system in Nigeria or through Government negotiated contracts. Participating private farmers and ranches would be free to procure cattle, goods and services (US$10.7 million) through local trading and commercial channels. The construction of on-ranch earth dams, trucks and roads, firebreaks and land clearing (US$2.5 million) would be carried out by the project's own Heavy Equipment Unit. Internationally recruited staff and consultants (US$2.6 million) would be hired according to procedures acceptable to the Bank.

viii. At full development, which would be reached in the tenth year of the project, incremental annual production would comprise about 4,200 t carcass weight of beef (equivalent to some 4% of current domestic production); about 11,000 breeding heifers and 700 breeding bulls, 75% of which would be of the scarce trypano-tolerant N'Dama breed. The value of this production would be of the order of US$10 million a year.

ix. The economic rates of return from the direct investments in the production components of the project are as follows: ranching companies 13% - 18%; private ranches 13%; and smallholder fatteners 15%. These rates of return are before charging LPU costs; when these are taken into account, the overall rate of return for the project is about 11%.

x. The other benefits of the project would be varied and important. The project would introduce modern techniques of livestock production and train Nigerian stockmen, extension staff, and project managers in the use of such techniques. Livestock credit facilities would be developed. The development of grazing reserves and use of improved pastures should increase carrying capacities, thereby helping to ease the confrontation between herdsmen and

agriculturalists in the heavily populated areas of the north. The smallholder cattle fattening component would provide a source of additional income by integrating livestock into the traditional crop production system. Studies on livestock taxation and development of land cleared of tsetse-fly sponsored by the project may well set the stage for a better institutional framework for livestock development and profitable investment in livestock production.

xi. The project is suitable for a Bank loan of US$21.0 million.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

I. INTRODUCTION

1.01 The Federal Government of Nigeria has asked for a Bank loan to assist finance a beef cattle development project. Project preparation was financed by the Bank and executed by a team of consultants in close cooperation with Government officers. The project would be the first for livestock development financed by the Bank in Nigeria, and only the third for agriculture. The first - Western State Cocoa (764-UNI) - is for planting and replanting cocoa. The cocoa loan became effective in late 1971 and is proceeding satisfactorily. A second cocoa project was approved in June 1974; three rural development projects, and a rice project were recently negotiated.

1.02 This report is based on the findings of an appraisal mission, in July/August 1972, composed of Messrs. N. A. Worker and T. C. Tsui (Bank); and F. L. Cockcroft, F. Blanc, E. de Smidt and C. Hopen (Consultants). Cost estimates were updated as of early 1974.

II. BACKGROUND

A. General

2.01 Nigeria is a federation of 12 states, each with a government responsible for the development of agriculture within its boundaries. The country is large, covering approximately 350,000 sq mi, and has good access to the sea. About one-half of the land can be classified as agricultural land; and of this, about 50% is cultivated while the remainder is good quality natural grassland. Climate is tropical; yearly rainfall varies from over 100 in/yr in parts of the Niger Delta in the south to less than 20 in/yr in the north, and there are well defined wet and dry seasons.

2.02 In 1972 official population estimate was about 68 million, with an estimated annual growth of about 2.5%. The final results of a recent census are not yet available, but the provisional tabulations of the census gave a figure of about 80 million people. GNP per capita is about US$130. With larger earnings from petroleum and other industries, the proportionate contribution to GNP of agriculture is declining, and agricultural production is hardly keeping pace with population increase.

2.03 Agriculture. Agriculture makes a very important contribution to the economy of Nigeria. More than 80% of the population live in rural areas and some 70% are employed in agriculture. Nearly one-half of GDP comes from the sector. Crop products account for some 80% of the total value of agricultural

output; livestock, fishing and forestry account for 10%, 6% and 4%, respectively (Annex 1). In the past, the emphasis of the Government's agricultural development policy has been mainly directed toward increasing export crops such as cotton and groundnuts (in the north), cocoa (in the south-west), and oil palm and rubber (in the south-east). Well-organized marketing facilities have been provided for these crops. By contrast, little has been done to stimulate the production and marketing of other agricultural commodities. Food crop production is mostly based on a traditional pattern in which the farmer's first objective is to grow food for himself and his family, with surplus production, if any, being sold for cash in the village. Farms are small and often fragmented, and typically vary between one and seven acres. While a variety of food crops are grown throughout the country, cereal production predominates in the north while root crops such as yam and cassava are more commonly grown in the south. Because food crop production has historically been identified with subsistence type farming, and because efficient marketing channels have not been organized, there has been little incentive for the individual farmer to increase production beyond local needs. However, with increasing urbanization the market for food crops is growing rapidly and prices are increasing. Given these circumstances, the time appears ripe for projects aimed at improving the production and productivity of food crop farmers, and the Bank Group is actively engaged in preparing such projects in both the north and south.

B. The Livestock Subsector

2.04 Nigeria has some 11 million beef cattle, 30 million sheep and goats, and 70 million poultry. Except for a highly commercialized and modern poultry industry serving the main urban centers, and apart from better disease control, the subsector has remained unchanged for at least a century. Government has recently accorded high priority to livestock development, stimulated by the rapid rise of beef prices in recent years and the fact that domestic production meets only about 70% of consumption. Increased population and improved living standards will further intensify demand, and increase prices and the need for imports (para. 6.02).

2.05 The Traditional Producer. The national herd of mainly Zebu-type animals is owned almost entirely by nomadic and semi-nomadic graziers, most of whom are Fulani and Kanuri living in the six northern states (Annex 2). The distribution of cattle is governed by the incidence of the tsetse-fly, which restricts most of the national herd to the Sudan Zone in the north; during the dry season, there is a southward movement in search of water and pasture.

2.06 Traditional livestock owners are not market-oriented, nor are they efficient cattle producers by modern standards. Calving rates are low (40-50%), mortality is relatively high (10 to 20% for calves and 4-10% for adults), and growth to slaughter maturity slow (4-5 years). The use of modern production

inputs, such as improved veterinary hygiene and nutrition, fencing, fertilizers, and supplementary feeds, is minimal. Changes are essential if the traditional herdsmen are to survive in an age in which grazing areas are being reduced by competition from crop farmers. As an initial step, Government has decided that the graziers and their herds must be encouraged to become more sedentary; in pursuit of this policy, a large-scale tsetse-fly eradication program is being financed with Federal funds. The land so freed is being settled, partly by nomadic herdsmen, under provisions of the 1965 Grazing Reserves Act, which permits Government to set aside land for the exclusive use of nomadic graziers.

2.07 Animal Health is the responsibility of the Veterinary Divisions of the State Ministries of Agriculture. Rinderpest, contagious bovine pleuropneumonia, worm infestation, trypanosomiasis, and cutaneous streptothricosis are the principal diseases; the importance of these and other diseases and their control are described in Annex 3. All but the latter two diseases are more or less effectively controlled. Trypanosomiasis is probably the most serious disease and Government is making efforts to eradicate the vector. Cutaneous streptothricosis is widespread and especially severe in humid southern areas. Zebu stock is very susceptible, but the N'Dama and Muturu breeds have high resistance. There is no proven treatment and control is through regular inspection and isolation; however, promising results are being obtained in the development of a vaccine.

2.08 The overall nutritional situation is difficult, and energy, protein, mineral and vitamin deficiencies all occur in traditional herds, especially during the dry season and the beginning of the rainy season.

2.09 Land Tenure. With insignificant exceptions, land is communally owned and administered by traditional leaders and family heads who, with the concurrence of local governments, grant rights of usufruct. Normally, such rights cannot be sold or transferred. Federal and State Government can acquire land for essential purposes on payment of compensation for improvements, including standing crops, and legal mechanisms exist under which commercial enterprises can lease land for agricultural development projects.

2.10 The nomadic grazier, however, has no established land rights under the traditional system; he usually receives permission to graze his cattle on common land not in agricultural use, and, in the dry season, on farm land where his animals consume crop residues. Unfortunately, with population and land pressures intensifying, the grazing areas are diminishing.

2.11 Taxation. Nomadic producers are subject to a standard cattle tax (Jangali) of N 0.75 for each adult animal. Local Government Authorities usually retain part of the revenue and pass the balance to other local and State institutions. Jangali is very unpopular with graziers, who employ various ruses to avoid paying; it is estimated that only 50-60% of the tax is collected. The dislike of Jangali makes an accurate national cattle census impossible; and measures to enforce tax collection make it difficult for official agencies, such as extension services, to work with the graziers. However, it appears impossible to abandon Jangali in the short run in view of its importance as a

revenue source. The present per head tax collection system is nonetheless a constraint on improving the traditional livestock industry and, under the project, studies would be made of alternatives to Jangali (para. 3.21).

2.12 Livestock Supporting Services (Annex 4). The organization of livestock services varies from State to State. In the north, animal health and production are jointly the responsibility of the Veterinary Divisions of the State Ministries. In the south, Veterinary Divisions deal with animal health and the Agriculture Divisions with livestock production. In terms of staff, most divisions, whether veterinary or agriculture, appear numerically adequate; but animal production work generally lacks a practical approach.

2.13 In 1965, the Federal Ministry of Agriculture and Natural Resources (FMANR) was created to coordinate all natural resources development at the national level. The Federal Livestock Department (FLD) is one of the six departments comprising FMANR and has four divisions. The Tsetse and Trypanosomiasis Division, established for over 20 years, is well-staffed, well-equipped and effective. It is responsible for the National Tsetse Clearance Program, which is aimed at eradicating the fly from 100,000 sq mi in the Sudan, sub-Sudan and northern Guinea zones. To date, about 35,000 sq mi have been cleared, and the Program is expected to continue for another 15 years. The Planning Division exists only on paper, although it is expected to be staffed shortly. The Veterinary Public and Animal Health Division is an advisory and regulatory body concerned with meat hygiene and animal health. The Federal Leather Institute is concerned with research and advice on hides' and skins' processing.

2.14 The Federal Livestock and Meat Authority, set up in 1969 and incorporated as a federal body in 1971, has wide terms of reference that encompass livestock production, trade, slaughter, processing and marketing. Staffing and management difficulties, and its inheritance of several uneconomic commercial enterprises, have caused financial difficulties.

2.15 Extension Services. The effectiveness of extension work with cattle owners leaves much to be desired, particularly in the north. In comparison, animal health services are effective and major diseases are generally under control. Apart from strengthening animal production work, State ministries need to gain experience in pasture improvement and range management.

2.16 Research. The physical facilities for agricultural research generally are very adequate. Research in livestock is undertaken principally by Federal agencies and the universities (Annex 4). A general criticism is that most research is insufficiently directed towards the solution of practical problems, although a notable exception is the Institute of Agricultural Research at Ahmadu Bello University.

2.17 Education and Training. Degree level training in veterinary science is offered at the Ibadan and Ahmadu Bello Universities. These two Universities as well as Ife and Nsukka also provide degree courses in agriculture. At present, some 40 veterinarians and 100 agriculturalists qualify each year, a substantial output. A two-year diploma course in animal health is offered at the Federal Veterinary School, Vom, and there is a similar course for agricultural technicians at Akure, Ibadan, Samaru, Kabba and Umadike. About 50 veterinary and 300 agricultural technicians receive the diploma each year,

and their quality is acceptable. It is clear, however, that emphasis needs to be given to encouraging practical attitudes toward problem-solving if Nigeria is to make the best use of its agricultural potential.

C. Integration of Agriculture and Livestock

2.18 With few exceptions, crop and livestock production are now separate industries. In the northern states, the only linkages between the two are the grazing of cattle and sheep on crop residues in the dry season, and the use of draught oxen by some farmers. In the south, because of tsetse, commercial livestock production is restricted to poultry, which is usually maintained under intensive battery conditions. Integration of crops and grazing animals would bring major benefits to the agriculture sector, including the diversification of farm production, with forage and feed grown specifically for livestock, better utilization of crop residues and by-products, and improvement of soil fertility by animal wastes and crop/pasture rotation. Unfortunately, the pace of such integration will be slow: in the heavily populated northern areas, the amount of land available for grazing animals is very limited, and the acquisition of such land is beyond the capacity of the majority of farmers. In these areas, the first objective should be rationalization of the existing system of grazing stock on crop residues in the dry season, to bring greater benefits to the farmer; a smallholder fattening scheme is thus included in the proposed project (para. 3.11). Another constraint to integrated livestock development in the north is that tsetse-free areas that are not heavily populated generally are too dry for crop production. The greatest potential exists in the very sparsely populated tsetse-infested areas further south, where until now human and livestock populations have been limited by the fly. In these relatively good rainfall areas, a close integration of livestock and cropping should be possible, provided the tsetse-fly is controlled. Little has been done so far to determine the most economical use of land cleared of tsetse-flies, and a study is urgently required. Such study, involving the determination of land use patterns, and infrastructure and organizational requirements, would require the commitment of considerable planning skills which are not yet available in Nigeria. For this reason the proposed project provides for consultants to undertake this work (para. 3.21).

D. Credit for Livestock Production

2.19 Commercial bank lending for agriculture is less than 2% of total outstandings, and this lending is mostly to farmers of substantial means for short-term cropping requirements and to well-secured cattlemen for trading purposes. Attempts to organize institutional credit - through regional and state credit agencies and cooperatives - have been largely unsuccessful (Annex 5). Traditional sources of credit for farmers and

livestock producers are private moneylenders. These meet short-term needs; medium or long-term capital investments in agriculture have been minimal so far.

2.20 Nigerian Agricultural Bank (NAB). To provide a credit channel for agricultural development, Government has established the NAB and is providing necessary funds for its operations. UNDP/SF is financing the costs of the NAB management team for the first three years, and the Bank is executing agency. NAB, whose head office is in Kaduna, would be the credit channel for the project.

E. Livestock Development Strategy

2.21 The main objective of Government's livestock development strategy is to reduce Nigeria's large meat imports (para 6.02) through increasing domestic production. This will require the introduction of more efficient production techniques and an intensification of Government's tsetse eradication programs, as national production has almost reached its full potential under the extensive production systems practiced by most beef producers (para 2.05 and 2.06). Against this background Government plans to:

(a) help farmers to take up beef production using modern and relatively intensive techniques;

(b) open up new grazing areas through tsetse-fly eradication; and

(c) provide incentives for nomadic graziers to settle and to enter the market economy.

2.22 The main obstacle to intensifying beef production in the private sector is the very limited experience of both producers and Government agencies in modern systems of pasture and cattle management. Thus before sponsoring private sector development on any major scale, Government needs to better acquaint itself with the technical problems involved, to test and establish technically and economically viable production techniques, and to train its livestock development planning and extension staff in the methods to be transferred to the private sector. To achieve the above, Government plans to develop State-owned ranches in the country's principal cattle raising areas which would test, and subsequently demonstrate, improved animal production methods and in addition produce substantial numbers of high quality breeding stock, which importantly would include cattle of the trypano-tolerant N'Dama breed, which would be available for sale to the private sector.

2.23 In the field of tsetse eradication, Nigeria has carried out successfully a major program over the last 20 years in the high grazing potential areas of the Sudan and northern Guinea zones. Government intends to continue the eradication program for another 15 years (paras. 2.13 and 2.18) and to clear

another 65,000 sq mi. This program is fully justified as present grazing areas are already overgrazed, and their extent is being diminished through occupation by farmers. Consequently, the creation of additional grazing land is essential. The project appraised in this report would not be involved directly in tsetse eradication; the Tsetse and Trypanosomiasis Division of the Federal Livestock Department has this well in hand. However, as in the past little attention has been paid to the development of tsetse cleared areas, a study on the most efficient means of exploiting land cleared of tsetse would constitute part of the project.

2.24 The bulk of the country's cattle are owned by nomadic and semi-nomadic graziers. Changes in the outlook and way of life of these people are essential if better use is to be made of Nigeria's cattle and land resources, and if the standard of living of the nomads is to be raised. Experience in how to effect such changes has been obtained in East Africa where groups of pastoralists have been encouraged to settle and use modern grazing methods under the inducement of exclusive rights to the use of range and water resources. It is expected that the provision of clear grazing rights combined with technical assistance would give pastoralists the incentive to settle, to improve their production methods, and to increase their cattle sales. The development of grazing reserves to provide such facilities would be a component of the project.

III. THE PROJECT

A. General

3.01 The project would promote improved methods of beef cattle production by nomadic and semi-nomadic graziers, small near-subsistence farmers, larger commercial farmers, and the public sector. It would include the introduction and improvement of research, training, support services for farmers and graziers, and the production of breeding stock for future livestock development programs. Principal components of the project would be:

(a) establishing a Livestock Project Unit (LPU) in the Federal Ministry of Agriculture and Natural Resources to carry out the project;

(b) establishing or improving seven breeding ranches;

(c) improving two fattening ranches;

(d) providing credit and technical support to about 50 commercial farmers and settled Fulani to establish breeding/fattening ranches;

(e) providing credit and technical assistance under a pilot scheme for up to 1,500 smallholders to take up beef cattle fattening;

(f) establishing 1,600 sq mi of grazing reserves, and improving the existing 300,000 ac Kukar Jangarai Reserve in North Central (NC) State;

(g) carrying out pasture improvement research; establishing a pilot pasture seed production scheme; and providing training facilities for government officials, farmers and herdsmen in practical cattle and pasture management;

(h) establishing a pool of heavy equipment for project land development, and road and dam construction activities; and

(i) employing consultants to evaluate the project on a regular basis, to conduct appropriate studies, and to prepare further stages of the national beef cattle program.

3.02 The project would be carried out over an eight-year period with the first year being devoted to staff recruitment and preparatory work. Organizational features are discussed in Chapter V.

B. Detailed Features

3.03 Breeding Ranches (Annexes 6 and 7; Map). Of the seven breeding ranches, two, Bornu and Darazo (60,000 and 2,500 ac respectively), are located in and owned by North Eastern (NE) State and operated by the State Ministry of Agriculture. The remaining five, Upper Ogun, Akuna, Ogboro, Oke Ako and Ibarapa, are in Western (W) State, and each extends to about 24,000 ac. Upper Ogun is owned and operated by the Western State Development Corporation, a wholly owned State company; Akuna, Ogboro, Oke Ako, and Ibarapa are owned by the W State Ministry of Agriculture. Under the project, two new companies would be created: a NE Livestock Company (NELC), owned by NE State, to take over Bornu and Darazo, and a Western Livestock Company (WLC), wholly owned by W State, to take over the other five ranches (para. 5.04). The principal objective of the breeding ranches would be the profitable production of breeding stock for sale to the private sector. The ranches would also undertake some fattening through the purchase of feeder steers in order to make use of the heavy pasture growth of the wet season.

3.04 The Bornu and Darazo ranches are easily accessible and have benefited from extensive bush clearing, fencing, and water development. However, both ranches operate at a loss. Under the project, stocking rates would be increased through developing 1,500 and 300 ac of improved pasture at Bornu and Darazo respectively and through improved management of natural pastures. The herds would be developed over project years (PY) 2-6 by the purchase of in-calf heifers and cows of local Zebu breeds. Although soils and topography are good, both ranches are in low rainfall areas (about 24 in), and the seven months dry season is long and hot; consequently, provision would be made for supplementary dry season feeding. It is estimated that with the above measures the ranches would be in full production by PY 7/8, whereafter annual sales would total some 4,500 head, compared with 230 head now.

3.05 The Upper Ogun and Akuna ranches have adequately sized herds, areas of cleared land, some fencing and improved pastures, water facilities and buildings. Ogboro, Oke Ako and Ibarapa, however, are essentially undeveloped and have no stock; and Ibarapa still has to be delineated. Major investments at Upper Ogun and Akuna would be in pasture improvement, 1,500 ac at each in PY 2-4, and some improvement to infrastructure. Investments at the other three ranches, in addition to stock purchases, would be for development of infrastructure, firebreaks and water, and for establishment of 1,500 ac of improved pasture at each ranch during the development period.

3.06 The five Western State ranches are located in areas of high tsetse-fly challenge. Thus, while conditions for pasture growth are superior to those in the north, development is constrained by the availability of trypano-tolerant cattle. Some 6,000 cows and heifers and 350 bulls would be required in PY 2-6 to stock each of the Ogboro, Oke Ako and Ibarapa ranches. Animals of the N'Dama breed would be the first choice because of their proven tolerance to trypanosomiasis and streptothricosis (para 2.07), and their general ability to do well in the area. Since there is a limited number of N'Dama in Nigeria, it is envisaged that animals would be imported from other countries such as Guinea and Mali; it is recognized, however, these countries may find it difficult to supply sufficient cattle to meet the need of the project during the first years. As an alternative, animals of the Keteku breed, which are available in sufficient number in Nigeria, could be used for grading up with N'Dama bulls; the experience with this crossbreeding is satisfactory in Nigeria. Assuming that stock availability is not a constraint, the five Western State ranches are estimated to turn off some 19,000 animals annually by PY 12/13, of which almost 7,000 would be heifers and 500 would be bulls suitable for sale to private farmers for breeding purposes. It would be a condition of disbursement that the annual investment program for the Western State ranches would be in line with the availability of breeding stock.

3.07 Fattening Ranches (Annex 8). Two existing fattening ranches would be further developed: Manchok (6,000 ac in NC State) and Mokwa (12,000 ac in NW State). Initial development of Manchok and Mokwa was carried out, respectively, under USAID and Federal German Government assistance programs which are now phased out. Both programs made considerable fixed investment in the ranches and initiated intensive cattle fattening operations on a small scale, essentially feed lots. However, the financial results of these operations were disappointing; experience has shown that neither the feed market nor the cattle market is sufficiently developed in Nigeria to justify intensive fattening methods. Yet, these ranches are readily accessible, enjoy adequate rainfall (50-60 in/yr) and acceptable soil type and topography, and possess excellent potential for development as grassland fattening units. In fact, limited pasture trials on the ranches have shown conclusively that high-yielding improved pastures can be profitably established. Therefore, the natural follow-up is the organization of the Mokwa and Manchok ranches into commercial fattening operations based on improved pastures and modern methods

of cattle and pasture management. These ranches would be operated by the Federal Government-owned National Livestock Production Company (NLPC), which would be created under the project.

3.08 The two ranches would be developed as finishing operations to provide fat cattle for the abattoir at Mokwa, and for the Kafanchan and Kaduna markets. Feeder steers would be purchased and fattened on about a 6-months cycle. Investments, which would be phased over PY 2-4, would be in pasture improvement, water development, stockhandling facilities, fencing, firebreaks, roads, vehicles and equipment. On each ranch 1,500 ac of improved pasture would be established. At full development (PY 4), total throughput of the two ranches would be about 10,000 head annually in contrast to about 3,000 animals fattened in 1972.

3.09 Private Ranches (Annex 9). To help sponsor privately owned breeding/fattening operations, credit and technical services would be provided to about 50 individuals involved in farming and cattle trading. About 25 of these would be in W State, and 25 in the NE State of whom about five would be Fulani in the Mubi area. About 30 ranches would be initiated in PY 2, and 10 each in PY 3 and 4. The size of individual operations would vary, but it is estimated that an average ranch would cover about 2,400 ac and be stocked with about 100 AU 1/ before development. Project-financed development would involve the provision of fencing, water supplies, and firebreaks needed to allow better utilization of natural pastures. Furthermore, limited areas of improved pasture would be established.

3.10 To stock the ranches, in-calf cows or heifers would be purchased in PY 2-5, and steers for fattening in PY 2-7 to make the best use of available forage. N'Dama cattle would be purchased to stock W State ranches, and White Fulani or Gudali cattle for NE State ranches.

3.11 Smallholders (Annex 10). Credit would be offered to up to 1,500 individuals -- about 1,000 in NE State and about 500 in NC State -- mostly smallholders but including some butchers and cattle traders to enable them to engage in fattening beef cattle. Crop residues, mill by-products, and surplus locally produced feeding stuffs would be used as feed. Such fattening presently is fairly widespread, although not very efficient, throughout the north of Nigeria. The principal objective of the project would be to demonstrate more efficient methods.

3.12 Participants would be individuals of good standing in the community able to conform with NAB creditworthiness criteria, who would be prepared to construct the simple facilities needed for confining and feeding the animals, and who would have sufficient family labor to care for the stock. Plans for individual operations would be prepared by LPU technicians and would include a financial schedule showing the composition and phasing of investments and expenditures. Credit would be supplied in kind by LPU as feeder steers,

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1/ An Animal Unit (AU) is defined as a weaned bovine.

veterinary supplies and feed. LPU would also be responsible for providing subborrowers with technical and marketing assistance. At full development in PY 6, it is expected that some 7,500 animals annually would be fattened under the scheme.

3.13 Grazing Reserves (Annex 11). A total of 1,600 sq mi of new grazing reserves would be established -- about 1,500 sq mi in NE State and about 100 sq mi in NC State -- to allow the most efficient utilization of natural grassland by traditional graziers. The reserves would be accessible areas of good quality grassland, freed of tsetse-flies under the National Program (para. 2.13). The land would be acquired and declared as Grazing Reserves by the State Governments, and this would be a condition of loan disbursement against expenditures incurred in the grazing reserve subproject. The reserves would be developed in units of 100 sq mi each, with four units being completed in PY 2, seven units in PY 3, and five in PY 4. Principal investments would be in firebreaks and roads, water development, stockhandling facilities, and accommodation and transport for Range Development Officers -- one of whom, with his staff, would be responsible for managing a unit. Stocking rates would be carefully supervised to ensure that overgrazing does not occur. In addition to grazing privileges, graziers using the reserves would be provided with dipping facilities and drugs and vaccines for their cattle; initially, they would pay a nominal annual fee of N 0.5/AU (para. 6.07).

3.14 A similar grazing reserve program in NE State financed by USAID in the last decade has had only partial success. The basic problem has been poor cooperation by some herdsmen and consequent overgrazing. However, it is believed that adequately staffed reserve management teams, as would be introduced under the project, should enable better cooperation with the herdsmen. In order to achieve effective grazing control, NE and NC States would delegate to each Range Development Officer the power to enforce matters such as grazing rights, grazing rotation and destocking (para. 5.06); such powers would be exercised whenever possible through traditional authorities.

3.15 The Kukar Jangarai Reserve in NC State is an established 300,000 ac grazing reserve. Under the project, 1,500 ac of improved pasture and necessary associated fencing would be established in PY 2-4 to demonstrate the feasibility of upgrading carrying capacity (Annex 11). Presently the reserve carries about 40,000 animals in the wet and 6,000 animals in the dry seasons; and it has reached its production potential under current pasture conditions. Graziers with access to improved pasture would be provided also with dipping facilities and other veterinary services and would be charged a monthly grazing fee of N 0.2/AU.

3.16 Improved Pastures, Applied Research, and Training. Competition is acute between crop farmers and cattle herders for land in the Northern States

(para. 2.10). This competition can be alleviated by increasing the stocking rates of grazing areas in these densely populated zones through introducing improved pastures, and better pasture management methods including the use of phosphate fertilizers to encourage legume growth. Pasture improvement also offers an opportunity for integrating cattle breeding and crop farming by small farmers. The basis of any program of improved pasture development must be the testing of pasture species and varieties potentially suited for Nigerian conditions. The importation of seeds of grass and legume cultivars proven under conditions similar to Nigeria would be undertaken both for planting on project ranches and farms and for testing at Mokwa. Principal importations would be varieties of Panicum maximum, Cenchrus ciliaries, Setaria sphacelata, Centrosema pubescens, Phaseolus acutifolius and Dolichos lablab. To ensure future seed supplies, LPU would operate a seed production section on the Bornu ranch.

3.17 A program of applied research is needed to solve the problems of developing an efficient pastoral industry. Apart from tsetse-fly control, constraints include the high costs of bush clearing and land preparation, and lack of experience in pasture management and in animal management itself. No studies have been made of suitable livestock farming systems, or of the possibilities of integrating the pasture-animal complex into the traditional shifting cultivation of the bush-fallow system. There is an urgent need for work in these areas, and, under the project, an appropriate research program would be initiated at the Mokwa ranch (Annex 13).

3.18 Better training in practical land and cattle management is also needed, and under the project a training center would be established at Mokwa, with an outstation at the W State Livestock Station at Fashola. The center would provide two-year courses, beginning in PY 2, that would emphasize grassland and animal production, animal health, farm management and production economics. The course would be practical in nature to enable trainees to manage commercial breeding and fattening operations in both the private and public sectors and to qualify as livestock extension agents. The center would also provide short courses for farmers and herdsmen. In addition, the project would provide 16 man-years of overseas training for selected agricultural and veterinary graduates to learn techniques of modern grassland and animal production in suitable countries.

3.19 Within six months of loan effectiveness the Federal Government would provide the Bank with satisfactory details of the land, buildings and equipment at Mokwa that would be transferred to LPU; the Bank has obtained appropriate assurances to this effect during negotiations.

3.20 Heavy Equipment Unit (Annex 14). The development of ranches and grazing reserves would require the construction of about 100 earth dams and

some 2,000 mi of firebreaks and internal tracks and roads. These are rudimentary civil works which do not require elaborate engineering design and which are generally carried out by ranch personnel and equipment in countries with a well-established ranching tradition. It is the Bank's judgment, however, that providing the ranches and grazing reserves with capability to carry out these works would raise serious questions of training and maintenance. In addition, it is unlikely that the services of private contractors could be secured: first because custom work is not a well-established practice in the rural areas of Nigeria and second, owing to the fact that the works would be dispersed, individually small, located in remote areas and phased over several years, civil work contractors would not be attracted. Therefore, to ensure that the amount of work planned under the project would be achieved on time and with good standards, the project would provide for a Heavy Equipment Unit (HEU) to be established within LPU to procure and operate the necessary equipment. The unit would consist of a full range of tractors, vehicles and equipment necessary to undertake all the major development work called for in the project. Most of this work would be undertaken in PY 2-4; for this reason, there would be some machine time available in PY 5 and 6 for hire to private farmers and others outside the project. HEU would be led by an experienced engineer who would be responsible, inter alia, for the training of the operating and maintenance staff.

3.21 Consultants. About 10 man-months of consultant time would be employed to assist project management in organizing a system of data collection, retrieval and analysis for the purposes of continuously monitoring project progress and to undertake annual evaluations of the project. The consultants would report their findings to the Permanent Secretary, FMANR, and to NAB for those aspects of the project that NAB finances. The large number of separate project components fully justifies such a periodical "technical audit". Consultants would also be employed (about 40 man-months) to conduct studies on livestock taxation (para 2.11), and to prepare detailed specifications for a survey and study of the most efficient means of utilizing land cleared of the tsetse-flies (para. 2.18), and to propose further development activity in the livestock field including appropriate feasibility studies. Outline terms of reference for the studies are set out in Annex 15. During negotiations, assurances were obtained that suitable consultants would be recruited internationally and that their qualifications and experience, terms of reference and conditions of employment would be acceptable to the Bank.

IV. COST ESTIMATES AND FINANCIAL ARRANGEMENTS

A. Project Costs

4.01 Project costs over the investment period of eight years are estimated to total N 27.6 million (US$42.0 million) with a foreign exchange element of N 13.7 million (US$20.8 million) or 50%. Project costs are detailed in Annex 16 and summarized in the following table:

Summary Project Cost Estimates

	N'000			US$'000			% of Total Cost	% Foreign Exchange
	Local	Foreign	Total	Local	Foreign	Total		
NELC								
Infrastructure and equipment	174	231	405	265	351	616	-	57
Breeding cattle	293	-	293	445	-	445	-	-
Incremental fattening cattle	252	190	442	383	289	672	-	43
Working capital	496	233	729	754	354	1108	-	32
Subtotal	1,215	654	1,869	1,847	994	2,841	7	35
WLC								
Infrastructure and equipment	875	910	1,785	1,330	1,383	2,713	-	51
Breeding cattle	84	1,588	1,672	128	2,414	2,542	-	95
Incremental fattening cattle	607	458	1,065	923	696	1,619	-	43
Working capital	1,402	1,015	2,417	2,124	1,538	3,662	-	42
Subtotal	2,968	3,971	6,939	4,505	6,031	10,536	25	57
NLPC/1								
Infrastructure and equipment	312	351	663	474	534	1,008	-	53
Working capital	351	151	502	534	229	763	-	30
Subtotal	663	502	1,165	1,008	763	1,771	4	43
Private Ranchers								
Infrastructure and equipment	932	675	1,607	1,417	1,026	2,443	-	42
Breeding cattle	993	916	1,909	1,509	1,392	2,901	-	48
Incremental fattening cattle	452	341	793	687	518	1,205	-	43
Working capital	387	213	600	588	324	912	-	35
Technical Services	27	-	27	41	-	41	-	-
Subtotal	2,791	2,145	4,936	4,242	3,260	7,502	18	43
Smallholder Fatteners								
Incremental fattening cattle	470	355	825	714	540	1,254	-	43
Incremental feed	210	-	210	319	-	319	-	-
Technical Services	71	-	71	108	-	108	-	-
Subrotal	751	355	1,106	1,141	540	1,681	4	32
Grazing Reserves								
Fulani - Infrastructure and equipment	450	368	818	684	559	1,243	-	45
- Other development expenses	1,072	285	1,357	1,630	433	2,063	-	21
Kukar Jangarai - infrastructure and equipment	138	104	242	210	158	368	-	43
- Other development expenses	126	40	166	191	61	252	-	24
Subtotal	1,786	797	2,583	2,715	1,211	3,926	9	31
Project Administration and Central Services								
LPU - Vehicles and equipment	9	144	153	14	219	233	-	94
Salaries and wages	589	721	1,310	895	1,096	1,991	-	55
Other expenses	190	47	237	289	71	360	-	20
Consultants	-	312	312	-	474	474	-	100
Seed multiplication	45	20	65	68	30	98	-	31
Overseas training	-	96	96	-	146	146	-	100
Heavy Equipment Unit								
Machinery and equipment	55	1,045	1,100	84	1,588	1,672	-	95
Working capital/2	92	108	200	140	164	304	-	54
Research and training								
Infrastructure and equipment	76	57	133	116	87	203	-	43
Salaries and wages	216	312	528	328	474	802	-	59
Other expenses	239	64	303	363	97	460	-	21
Subtotal	1,511	2,926	4,437	2,297	4,446	6,743	16	66
Total Project Cost Before Price Contingency	11,685	11,350	23,035	17,755	17,245	35,000	-	50
Price Contingency/3	2,265	2,340	4,605	3,445	3,555	7,000	17	50
TOTAL PROJECT COST	13,950	13,690	27,640	21,200	20,800	42,000	100	50

/1 Purchase of steers for fattening would be financed by seasonal bank overdrafts and subprojects. Maximum overdraft requirements would build up to about ₦ 800,000 in FY 5 and 6 and would decline thereafter (Annex 8).
/2 Estimated needs to cover about 6 months operating expenses.
/3 Six percent per year compounded years 1-8. The physical contingencies are included in each investment category and shown separately in the respective annexes.

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4.02 Project costs are based on recent experience in Nigeria and include a physical contingency equivalent to 10% of estimated costs, a price contingency of 6% compounded annually on both local and foreign costs.

B. Proposed Financing

4.03 The Federal Government; the Bank; the NAB; the Western, North Eastern and North Central State Governments; and private individuals are expected to participate in financing the project in line with the following table:

	Private	State Government	Federal Government	NAB	IBRD	Total
	----------	----------	US$ millions	----------	----------	----------
NELC	-	0.90	-	0.48	1.46	2.84
WLC	-	3.11	-	1.86	5.56	10.53
NLPC	-	-	0.97	0.16	0.64	1.77
Private Ranches	1.80	0.10	-	1.40	4.20	7.50
Smallholder Fatteners	0.08	0.15	-	0.34	1.11	1.68
Grazing Reserves						
Fulani	0.15	1.95	0.61	-	0.61	3.32
Kukar Jangarai	0.04	0.18	0.20	-	0.20	0.62
Project Administration and Central Services	-	-	2.94	-	3.80	6.74
Subtotal	2.07	6.39	4.72	4.24	17.58	35.00
Unallocated	0.03	1.51	1.18	0.86	3.42	7.00
Total	2.10	7.90	5.90	5.10	21.00	42.00
%	5	19	14	12	50	100

4.04 It is proposed that a Bank loan of US$21.0 million be made to Government for a term of 20 years including a grace period of six years for principal. Consequently, the Bank loan would be disbursed before the project was completed. However costs in PY 7 and PY 8 would be small -- about N 770,000 and N 350,000 respectively -- and the principal expenditure items in these two years would not lend themselves to Bank disbursement. During negotiations assurance was obtained from the Federal Government that it would cause all funds required for PY 7 and 8 to be made available. The Bank loan together with a Federal Government contribution of N 3.9 million (US$5.9 million) would be deployed as follows:

a. N 8.6 million (US$13.1 million) would be on-lent to NAB at the same interest rate as the Bank loan for a term of 16 years including six years grace for principal; these

funds together with NAB's own contribution of N 3.4 million (US$5.1 million) would be used for further on-lending to ranching companies and private farmers and ranchers (paras. 4.07 and 4.08);

b. N 1.1 million (US$1.7 million) would be passed on to NE and NC States as grants in aid to cover grazing reserve investment costs in line with Government's policy of granting financial support to the states for high priority development;

c. N 4.4 million (US$6.7 million) would be used to meet costs incurred by FMANR in administering the project, and providing services;

d. N 0.5 million (US$0.8 million) would be invested as equity in NLPC; and

e. N 3.0 million (US$4.6 million) would be held as a contingency reserve.

4.05 The State Government contributions to project costs would be contributions to the equity of the state ranching companies, N 0.6 million (US$0.9 million) and N 2.0 million (US$3.1 million) in the cases of NE State and W State respectively; and the direct and indirect costs of state employees seconded to LPU for administration of the smallholder fattening scheme, private ranches and grazing reserve subprojects. The contributions of private individuals would be principally their share of private ranch and smallholder fattening investment costs, about 25% and 5% respectively. Beneficiaries of the grazing reserve subproject would make a small contribution to project costs through the payment of grazing fees.

4.06 A condition of loan effectiveness would be the execution and delivery on the part of the Borrower of a satisfactory subsidiary loan agreement with NAB.

C. Credit Arrangements

4.07 The terms of NAB subloans to the state ranching companies, NLPC and private ranchers would be between 13 and 15 years, including a grace of 3 to 5 years for principal, at an appropriate interest rate varying between 5% and 9-1/2%. The subloans would be granted only on the basis of LPU recommendations (para 5.01). In the case of state ranches, NAB loans would be guaranteed by the respective Governments. NLPC operations would have additional financial needs in the form of seasonal credit for feeder steer purchases, which would be provided through overdraft facilities with either NAB or private banks. Such overdrafts would reach a maximum of about N 800,000 (US$1.2 million) in PY 5 and 6 and would decline progressively thereafter.

4.08 Credit to smallholders would be supplied in kind by LPU, on behalf of NAB for a term of up to 12 months at an appropriate interest rate varying between 5% and 9-1/2%. LPU would meet the cost of these inputs from a revolving account which NAB would establish with a deposit of N 200,000 to cover estimated PY 1 requirements. LPU would collect 5% of the cost of inputs from smallholders upon delivery of such inputs and the balance of the cost with interest would be recovered following sale of stock. The proceeds of these collections would be returned to the revolving account by LPU. Credit agreements between participants and LPU on behalf of NAB would specify, inter alia, that each farmer would carry out fattening operations in accordance with technical advice provided by LPU, and would sell his fat cattle at a time and through channels prescribed by LPU. During negotiations, IBRD received assurances that the procedures, terms and conditions of NAB sublending would be satisfactory to IBRD, and that NAB would submit for IBRD approval, no later than five months after loan effectiveness, proforma subloan agreements for the State ranching companies, private ranchers and smallholders.

D. Procurement

4.09 The procurement of vehicles, earthmoving and other equipment, housing and fencing wire (US$4.7 million) would be by international competitive bidding, for all contracts in excess of US$25,000. Domestically manufactured goods would be allowed a preference of 15 percent or the prevailing customs duty whichever is lower; bids by eligible domestic contractors would be allowed a preference of 7-1/2 percent. All other procurement of equipment for the State-owned ranches (US$1.3 million) would be through locally advertised competitive bidding procedures, except for small items which would be purchased directly. Livestock purchases for the State-owned ranches (US$5.8 million) would not be subject to international competitive bidding because the project requires cattle suited to local conditions that can only be obtained through the traditional trading system in Nigeria or through Government negotiated contracts. Participating private farmers and ranches would be free to procure cattle, goods and services (US$10.7 million) through local trading and commercial channels. The construction of on-ranch earth dams, trucks and roads, firebreaks and land clearing (US$2.5 million) would be carried out by HEU (para. 3.20). Internationally recruited staff and consultants (US$2.6 million) would be hired according to procedures acceptable to the Bank.

E. Disbursement

4.10 The Bank loan would be disbursed to cover: (a) 75% of subloans disbursed by NAB to NELC, WLC, and private ranchers for fixed investments and cattle, (b) 85% of subloans disbursed by NAB to NLPC for fixed investment, (c) 75% of annual incremental disbursements made from NAB's smallholder fatteners revolving fund, (d) 50% of Federal Government grants to the NE and NC States for fixed investments in the Grazing Reserves, (e) 100% of the cost of expatriate personnel and consultants, and (f) 100% of foreign expenditures or 85%

of total expenditures for vehicles, equipment and machinery for Project Administration and Central Services. Disbursements against NAB subloans would be made against certificate of expenditures, the documentation of which is not to be submitted for review, but is to be retained by the Federal Government and is to be available for inspection by the Bank during the course of project supervision missions. Estimated disbursements on a quarterly basis are shown in Annex 17.

F. Accounts and Audit

4.11 The accounts of NLPC, NELC, and WLC would be maintained by their respective managements. Accounts for other components of the project would be maintained by LPU, whose Project Accountant would also advise the ranching companies on their accounting systems. Individual credit accounts for private borrowers would be maintained by NAB. Assurances were obtained during negotiations that: (a) LPU, the ranching companies and NAB would maintain accounting systems, in accordance with sound, consistently applied principles; and that in particular, the ranching companies would maintain separate accounts for each ranch; and (b) all project accounts referred to above would be audited annually by independent auditors acceptable to the Bank and that certified copies of the audited accounts, together with the auditors' reports, would be submitted to the Bank within six months of the end of each financial year.

V. ORGANIZATION AND MANAGEMENT

A. General

5.01 The project's organization would be complex due to Federal/State interrelationships. The basic concept would be, however, that in the eight-year project investment period, the FMANR would play the leading role through the medium of LPU, created within its Livestock Division. For the ranches owned by Federal and State companies, LPU would provide detailed ranch development plans, and on behalf of NAB would supervise their development and operational progress. Disbursement of NAB loan funds to the ranching companies would be conditional upon satisfactory reports by LPU, and such provision would be made in the subsidiary loan agreements between NAB and the ranching companies (para. 4.07). In the case of private ranchers and smallholder fatteners, LPU would assume direct responsibility for the technical appraisal of potential participants, for the preparation of development plans, and for technical supervision of individuals receiving loans from NAB (para. 4.07). Disbursement of NAB loans to private farmers and ranchers would be conditional upon satisfactory reports by LPU; and, in the case of smallholder fatteners, LPU would have more direct control since it would disburse loans on NAB's behalf (para. 3.12). In each State participating in the private sector components of the project, the State Government would second to LPU the staff

needed for such work and would meet their direct and indirect costs. These staff would be responsible directly to LPU. The Federal and States Governments would arrange for the secondment of staff to LPU to carry out the private ranch and smallholders project components. These arrangements would remain throughout the life of the project and would have the objective of training state employees in the management of such operations. With the same objective and during the project development period, LPU would develop and manage for NE and NC States the Grazing Reserves established under the project, employing staff who would be seconded from the State Governments. For research and training, LPU would be directly responsible for operations at Mokwa and Fashola and would make the final selection of trainees sent overseas. LPU would be responsible also for the operation of the seed production unit at the Bornu Ranch. It is anticipated that at the end of the development period LPU would hand over its research and training functions to the regular services of the Federal Livestock Department (FLD).

B. Livestock Project Unit

5.02 LPU would be headquartered at Kaduna and be headed by a Project Manager, who would be a specialist in tropical grassland and cattle management. The Project Manager would be administratively responsible to the Director of FLD, but LPU would enjoy a high degree of technical and financial autonomy. During negotiations assurances were obtained for the establishment of LPU under an administrative structure acceptable to IBRD. The establishment of LPU would be a condition of effectiveness of the loan. Two Deputy Project Managers would be employed by LPU, with responsibilities for Northern and Western States' activities respectively, with the latter stationed at Ibadan. Other key operational staff would include a Project Accountant, Ranch Planner, three Ranch Technical Officers, one of whom would supervise the smallholder fattening scheme, and a Chief for the Heavy Equipment Unit. Terms of reference for senior LPU staff are at Annex 18. All the foregoing staff would be recruited internationally; in view of the shortage of experienced personnel in Nigeria it is possible that Nigerians would fill only the posts of Deputy Project Managers and Accountant. Six Nigerian agricultural graduates would complete LPU's operational staff; these graduates would be regular employees of FLD and would have specific responsibilities.

5.03 For its research and training functions based at Mokwa, LPU would employ, through international recruitment, a Livestock Production Specialist as Officer in Charge, and two Research Officers, one specialized in tropical pastures and the other in land development. These specialists would be assisted by six Nigerian agricultural or veterinary graduates who would be regular employees of FLD. During negotiations, assurances were obtained from the Federal Government that appointees to key positions in LPU would be filled by persons with experience and qualifications acceptable to the Bank. A condition of loan effectiveness would be appointment of the Project Manager' and two Deputy Project Managers of LPU.

C. Ranching Companies

5.04 The three ranching companies would be owned wholly, initially at least, by the Federal (para. 3.07), NE State and W State Governments (para. 3.03) respectively. A condition of effectiveness would be the establishment of the three companies. The policy of the three companies would be determined by boards whose chairmen would be the General Managers of the companies; these General Managers would be responsible for day-to-day operations. To keep overheads to a minimum and to clearly define accountability, each ranch would be autonomous within the frame of annual budgets, work programs and operational procedures approved by the company boards. This autonomy would extend to day-to-day management, junior staff appointments, accounting, procurement, and sales. Persons appointed to the posts of ranch managers and ranch bookkeepers would be recommended by the General Managers and be approved by the company boards and by NAB.

D. Smallholder Fattening Scheme

5.05 LPU would manage the pilot smallholder fattening scheme (para 3.12) until such time as operational techniques and procedures are proven, when, if agreed by the Bank and Federal Government, full responsibility would be transferred to NE State. The scheme would be staffed by NE and NC State MANR employees working under one of the LPU Ranch Technical Officers.

E. Grazing Reserves

5.06 Similar management arrangements as for smallholders would be used for the grazing reserve component of the project except for the Kukar Jangarai reserve which would substantially continue under its management. Thus, NE and NC States would employ the 16 range development officers and support staff needed to manage the scheme and second these to LPU. Details of the operational procedures of the Grazing Reserve Scheme are in Annex 2. In regard to the Kukar Jangarai Reserve, arrangements between LPU and NC State would specify that the latter would assign appropriate staff and would permit LPU to manage the scheme.

F. Nigerian Agricultural Bank

5.07 NAB would take the final decision on each request for financing made to it although its decisions would be influenced by the technical advice that would be given by LPU. NAB would assign an adequate number of loan officers and clerical staff who would be attached to the smallholder fattening scheme, and to LPU to be responsible for determining the creditworthiness of potential participants in the private ranching scheme. During negotiations, assurances were obtained from NAB that this additional staff would be appointed and that appropriate arrangements would be made for their accommodation and transportation.

VI. PRODUCTION, MARKETS, PRICES AND PRODUCER BENEFITS

A. Production

6.01 Project output would consist of fat cattle, feeder steers and breeding cattle. Approximate full development would be in PY 10. At that time, the incremental annual beef output would be about 4,200 m ton carcass-weight, equivalent to about 4% of 1970 domestic production and worth about N 4.2 million (US$6.4 million). The project would also contribute about 11,000 breeding heifers and 700 breeding bulls annually valued at N 2.3 million (US$3.5 million) for further expansion of the national herd; about 75% of this cattle would be of the scarce trypano-tolerant N'Dama breed. Total annual incremental value of production due to the project at PY 10 would be about N 6.5 million (US$9.9 million). The aggregate herd of all breeding units participating under the project would have increased by about 65,000 AU valued at N 11.0 million (US$16.7 million).

B. Markets

6.02 Market Outlook. Cattle produced under the project would be sold domestically. The market outlook is good. The rapid population increase, urbanization, increase in per capita incomes, destruction of livestock resources during the civil war, repeated droughts during the last 5 years, increasing encroachment of crop farming upon pasture land, and stiffer competition with other meat and livestock importing countries have all helped to cause beef demand to outpace supply. Consequently, between 1967 and 1973 beef prices in Lagos increased 70 to 100%, and indications are that this trend will continue. Beef consumption in Nigeria is estimated to increase between 6 and 8% per annum over the next 10-15 years -- thus doubling in 12 years -- and to approximate 1.9 million head per annum by 1980 (about 270,000 tons of carcass meat) and 2.5 million head per annum by 1985 (about 357,000 tons of carcass meat). With increasing shortages in Cameroon, Dahomey, Togo, Ghana

and Ivory Coast, and increasing internal demand in Niger and Chad -- the traditional cattle suppliers of Nigeria -- Nigeria is likely to find it increasingly difficult to increase its imports above recent levels of 250-300,000 head of cattle per annum (about 40,000 tons of carcass meat). Thus project output (para 6.01) would be absorbed comfortably by the domestic market. Breeding stock produced by the project (11,000 heifers and 700 bulls per annum) are expected to find a ready market in the private sector and future Government livestock development projects.

6.03 Market Facilities and Procedures. Cattle markets exist in all major towns and in many of the smaller ones, but most are little more than meeting places for sellers and buyers and lack even simple facilities such as scales. Auctions are not held and dealings are made individually on an estimated weight basis. Limited as they may be, these markets provide cattle producers with a dependable outlet within easy access. Major cities like Kaduna, Mokwa, Maiduguri, Nguru and Bauchi have modern slaughterhouses with processing and chilling capacities of 20 to 30 animals per hour, but they generally operate well below capacity. The small municipal abattoirs, which handle 90% of all slaughterings in Nigeria, consist of simple concrete slabs. It is estimated that existing capacity can handle at least a 50% increase in throughput. Thus the available cattle marketing and processing facilities are adequate for the project.

C. Cattle Prices

6.04 The spread between producer prices and those received by traders at southern markets is broad, reflecting in part the considerable risks taken by traders in moving live cattle over many hundreds of miles. The current minimum ruling price in southern markets is N 0.28/lb (0.43 US$/lb) liveweight; thus, 700-800 lb steers delivered in Lagos or Ibadan sell at N 195-225 (US$295 to 340) each. Further North, however, where the project areas are located, producer prices for 700-800 lb steers range between N 160-180, about N 0.225 per lb liveweight. Size and weight, assessed by eye, determine price; age, sex, quality are of far lesser importance. Calculations in this report are based on the assumption that all cattle for slaughter or fattening would be sold at N 0.225 per lb liveweight. This can be considered a conservative approach in the light of the prevailing market outlook (para. 6.02).

D. Producer Benefits

6.05 Financial benefits accruing to the three ranching companies and private ranchers are satisfactory and are estimated as follows:

	Full Development (PY)	Cash Balance After Debt Service (N)			Financial Rate of Return
		Before Development	Full Development	Increment	
NLPC	6	(44,000)	14,000	58,000	18%
NELC	8	(59,000)	46,000	105,000	14%
WLC	12	15,000	341,000	326,000	13%
Private Ranchers	9	800	8,200	7,400	13%

An average smallholder fattening five head of cattle annually under the project would achieve an incremental net income of about N 67 which is substantial if judged against average family incomes in the rural sector of about N 125 per annum. More detailed information on financial returns can be found in Annexes 6-10.

6.06 Financial benefits to individual Fulani graziers utilizing the Grazing Reserves developed or improved under the project are more difficult to quantify because of variation in herd size and the complexity of ownership. However, assuming that each family shares the overall benefits of development in proportion to the size of its herd, the growth in family incomes can be approximated. As Annex 11, Table 3 shows, the value of total offtake from herds using project developed reserves would improve from about N 23,000 before development to N 47,000 per unit (64,000 ac) in PY 10, equivalent to a compound rate of growth of 8%, which would also be the average annual income growth of a participating family. Income prospects would not, however, be the sole nor necessarily the most important inducement for Fulanis to participate in the project; it is probable that the security of tenure offered by the project would be as great an inducement as the cash rewards.

6.07 The ranching companies, private ranchers and smallholder fatteners would pay ultimately the full costs of developing their respective operations. Exceptions would be the costs of technical assistance provided by LPU and the State MANR. These costs would be borne by the Federal and State Governments as is the case for all routine extension activities in Nigeria. Graziers, on the other hand, would pay fees covering only a small part of the development and recurrent costs of the grazing reserves and would enjoy a substantial subsidy from Federal and State Governments. This is considered justified for what would be the pioneering phase of a much larger grazing reserve program aimed at settling a significant proportion of the country's nomadic graziers. Consequently the fees to be charged under the project would be sufficient to establish the principle that the use of improved land must be paid for, but not too high to discourage participation. The twin problems of the graziers' ability and willingness to pay fees would be studied in detail in the course of preparing the second phase livestock project with the objective of establishing equitable and enforceable fee levels.

VII. ECONOMIC BENEFITS AND JUSTIFICATION

7.01 The project would be the first major step taken by the Federal and State Governments to develop Nigeria's large potential for grassland beef production and to reap the reward from past investments in animal disease control and livestock-related research and training. As such the project would have large and widespread but unquantifiable benefits which cannot be taken into account in calculating its economic rate of return. This is unfortunate, since these unquantifiable benefits are of far greater value to Nigeria than the direct production generated by the project.

7.02 The project's direct benefits would be the project induced beef and breeding stock production (para 6.01). On the basis of these benefits the economic rates of return from investment in the directly productive component subprojects are estimated as follows: NLPC, 18%; NELC, 14%; WLC, 13%; private ranches 13%; and smallholder fatteners 15%. The return from investment in the pilot grazing areas to be developed under the project is difficult to quantify, however, and would depend on the rate at which nomads settle and begin to produce cattle for the purpose of sale rather than of increasing herd numbers. At this time it is not possible to speculate how quickly, or to what extent, this will happen; this component of the project is designed to provide information of this type for use in formulating future policy. The overall rate of return to the project, without taking into consideration the grazing reserves and training component, but including the costs of the Federal Government Livestock Development Unit, is estimated at about 11% (Annex 20).

7.03 The major unquantifiable benefits are: (a) the development of a source of improved breeding stock, especially of trypano-tolerant breeds; (b) the demonstration on a practical scale of the use of improved pastures; (c) the initiation of the private sector into modern systems of cattle production; (d) the rationalization of development of land freed from tsetse infestation; (e) the mobilization of trained Nigerian veterinarians and agriculturalists to work on a major livestock development program; (f) the demonstration of the feasibility of integrating livestock and crop farming at the small farmer level; and (g) the development of techniques for settling nomadic graziers and inducing them to adopt controlled grazing methods.

7.04 Most aspects of the project, while not new, involve the employment on a significant scale of systems and methods that so far have been employed in Nigeria only on a very restricted scale. Consequently, the project can be classified as a large scale pilot project, with the objective of determining the most efficient means of combining proven technology with the particular demands of the Nigerian situation.

7.05 The direct social benefits of the project such as the creation of new employment opportunities are not large: it is estimated that the project would induce additional employment equivalent to about 900 man-years. On the other hand the project would help solve problems of pressing social concern. One of these is the increasing confrontation between herdsmen and

agriculturalists in the heavily populated areas of the north; this would be relieved by the development of grazing reserves of the type to be established under the project, and by the increased use of improved pastures with their higher productive capacity. A related problem is to increase farm incomes in these same heavily populated areas. The integration of livestock and crop production would be attempted through the project's smallholder beef fattening component. A third problem of pervasive importance is that of cattle taxation, and hopefully solutions to this would emerge from studies that would be financed under the project.

7.06 The project represents a logical development from the past work carried out with beef cattle in Nigeria. Without the impetus that would be created by the project, it is likely that few positive changes would emerge in the beef cattle sector over the next several years.

VIII. AGREEMENTS REACHED AND RECOMMENDATIONS

8.01 During loan negotiations, assurances were received on the following principal points:

(a) procedures, terms and conditions of NAB sublending would be satisfactory to IBRD, and NAB would submit for IBRD approval, no later than five months after loan effectiveness, proforma subloan agreements for the State ranching companies, private ranchers and smallholders (para. 4.08); and

(b) key staff positions in LPU would be filled by persons with experience and qualifications acceptable to IBRD (para. 5.03).

8.02 Conditions of loan effectiveness would include:

(a) the execution and delivery on the part of the Borrower of a satisfactory subsidiary loan agreement with NAB (para. 4.06);

(b) the establishment of LPU (para. 5.02) and the NLPC, NELC and WLC (para. 5.04); and

(c) the appointment of the Project Manager and two Deputy Project Managers of LPU (para. 5.03).

In addition, a condition of loan effectiveness would be that IBRD had received satisfactory assurances on the part of NC, NE, and W States with respect to the carrying out of the project, including the secondment of staff.

8.03 Conditions of disbursement of the funds earmarked for the W State breeding ranches and the NE and NC States grazing reserves would be that:

(a) satisfactory arrangements had been made for the procurement of suitable cattle for the W State breeding ranches (para. 3.06); and

(b) NE and NC States had acquired areas as grazing reserves satisfactory to IBRD (para. 3.13).

8.04 The project is suitable for an IBRD loan of US$21.0 million on standard terms.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

The Agriculture and Livestock Subsectors

A. General

1. Nigeria is situated in Western Africa between longitudes 2°50' and 14°40' East and latitudes 4°20' and 13°50' North. It borders on the Atlantic Ocean in the South and shares common land boundaries with Dahomey, Niger and Cameroon. Administratively, the country is divided into 12 states, each state government being responsible for development of agriculture within its boundaries. The total area of the country is approximately 356,000 sq mi. The land for the most part is flat, rising from the low-lying coastal plains in the south to an altitude of 2,000 ft, in the north. Over 93% of the total area lies below 2,000 ft, and, apart from a limited 5,000-6,000 ft plateau area in the North-Central State and some rangelands along the Cameroon border, the topography has few distinguishing features.

2. Just over one-half of the land in Nigeria is classified as agricultural land. Of this about 45% is cultivated and 55% is in good quality natural grassland. Of the land not considered suitable for agriculture, the greater part is savanna grassland and forest. The majority of soils are ferruginous tropical soils. Ferrasols, lithosols and alluvial soils are also fairly common. For the most part, Nigerian soils are classified as free-draining and of medium to low fertility.

3. There is a wide range of climatic and vegetative zones. The climate is tropical, with temperatures for the most part ranging between 65°F and 95°F. Rainfall varies from over 100 in/yr in parts of the south to less than 20 in/yr in the north. In most areas there are well defined wet and dry seasons. The wet season extends from about April to November in the south and May to October in the north. Humidity also varies greatly with latitude, being extreme at times in the south and moderate for the most part in the north.

4. The official population estimate of Nigeria is 68 million, with a growth of approximately 2.5% p.a.

B. Agricultural Sector

5. Agriculture makes a very important contribution to the economy of Nigeria. More than 80% of the population live in rural areas and some 70% are employed in agriculture. Less than 50% of GDP comes from the sector. Crop products account for some 80% of the total value of agricultural output

with livestock, fishing and forestry accounting for some 10%, 6% and 4% respectively. Present GNP per capita is estimated at about US$130. The low per capita reflects both the predominance and low productivity of Nigerian agriculture. Value added per worker is estimated at US$ 195 in agriculture, as compared with US$ 513 in industry.

6. Government emphasis on development of the agricultural sector in the past has been mainly directed toward increasing export crops such as cotton and groundnut (in the north), cocoa (in the southwest) and oil palm and rubber (in the southeast). The provision of well-organized marketing facilities for these crops by Government has been a noteworthy feature of development strategy. By contrast, little has been done to stimulate the production and marketing of other agricultural commodities. Food crop production is for the most part based on a traditional subsistence pattern in which the farmer's first objective is to grow food for himself and his family, with surplus production, if any, being sold for cash in the village. Farms are small and often fragmented, and typically vary between one and seven acres. While there is considerable diversification in food crop production throughout the country, cereal production predominates in the north while root crops such as yam and cassava are more commonly grown in the south. Because food crop production has historically been identified with subsistence type farming, and because efficient marketing channels have not been organized, there has been little incentive for the individual farmer to increase production beyond local needs.

7. In its Second National Development Plan (1970-74), Government places high priority on development of agriculture, although only some 13% of public sector capital investments are allocated to the sector (Table 1). The plan lays down the following broad objectives: (a) ensuring adequate food supplies; (b) expanding export crops; (c) producing raw materials for local industries; (d) increasing employment opportunities in rural areas; and (e) strengthening institutional and administrative infrastructure. During the first two years, investments made under the Plan have been considerably less than projected. The main problem appears to be the sector's limited capacity to plan and execute programs; and there appears to be little likelihood that the situation might improve in the immediate future. Agricultural growth through 1975 is likely to be very small.

C. Livestock

8. Introduction. In comparison with cropping the livestock subsector is relatively small. However, Government has recently accorded high priority to expanding livestock numbers and particularly to expanding and modernizing its cattle industry. Government action in this respect is prompted by the fact that present beef production meets only 70% of the country's needs. This deficit is met by importing both processed meat and live cattle at considerable foreign exchange cost. In addition, Government has now come to realize that its cattle herd is a valuable national asset, capable of considerable expansion, and a means for developing extensive areas of the country unsuitable for agricultural production.

9. Livestock products account for some 10% of total agricultural production. Some 650,000 to 700,000 domestic cattle and 250,000 to 300,000 imported cattle pass through organized market channels each year. Sales of local cattle represent a marketed offtake of 8-9% of the national herd, which is variously estimated at around 10 million head.

10. The Traditional Producer. The national herd of mainly Zebu-type animals is owned almost entirely by nomadic livestock owners, the largest proportion of whom are either Fulani, Kanuri or Shuwa located in the six northern states. The distribution of cattle is a function of tsetse-fly incidence. The largest concentration of cattle is in the Sudan Zone in the north, with seasonal movement south (into the sub-Sudan and Guinea Zones) during the dry season.

11. Cattle farming is undertaken on only a very limited scale in the southern states due to the high incidence of tsetse-fly infestation. Total cattle in the south number only about 200,000. The small and scattered herds are restricted to the N'Dama, Keteku and Muturu breeds which possess good tolerance to trypanosomiasis. Cattle of other breeds seen in the south are invariably trade cattle being trekked from the north to Lagos, Ibadan, Port Harcourt, and other southern market centers.

12. Traditional livestock owners of the north are not market-oriented, having little apparent desire to sell their livestock. They prefer to see the herd grow in number, regarding it as a source of pride and security for themselves and for future generations. They are not large beef-eaters and seldom kill cattle for food; rather they relish milk and value their animals more for dairying ability than for beef production. Milk is sold wherever there is a market, and income from milk sales is the main source of cash for day-to-day needs. The material requirements of the Fulani are extremely modest and, apart from culling animals for extreme old age, it is only under pressing circumstances such as the necessity to pay head tax or crop damage fines, that they dispose of their stock.

13. While the nomadic herdsmen regard the herd as all-important and devote their lives to ensuring its well-being, they are not by modern standards efficient cattle producers. Calving rates are low (40-50% is common), mortality of stock is relatively high (up to 20% in calves and up to 10% in adults) and growth to maturity is slow (4-5 years). Nomadism works both for and against the herd. It works for it in the sense that, under the harsh conditions that exist, the best available grass is sought in areas of lowest tsetse challenge. It works against it in that the nomadic habit precludes the application of modern production concepts (e.g. improved veterinary hygiene and nutrition, fencing, fertilizers and supplementary feeds), which have proved so successful elsewhere in raising livestock productivity. The traditional herdsmen has learned to cope in the face of high odds. However, if he is to survive, let alone expand, in an age in which settlement is continually reducing grazing areas, a change in traditional ways is necessary. Government has decided that, in order to modernize and expand the Nigerian cattle industry, the cattlemen and their herds, or at least a large part of them, must be encouraged to become more sedentary.

14. Marketing. Cattle marketing in Nigeria is controlled by a well-organized chain of private traders in the north. These traders operate at several different levels, ranging from those who buy a few animals from producers in the bush to those who assemble and dispatch several hundred animals per year to southern markets. Once assembled, trade cattle are shipped either locally or interstate for immediate slaughter. There are no organized intermediate fattening operations, although there appears to be no obvious reason why this should be; the establishment of such enterprises should be encouraged in order to ensure better finish and higher weights of slaughter cattle. Cattle are moved on foot (about 55%), by rail (about 30%), and motor lorry (some 15%). Rates of mortality and shrinkage are significant in all transported cattle; highest losses are experienced by trek cattle.

15. Taking into account the time and trouble involved in assembling cattle for shipment and the losses and risks associated with movements over large distances, there can be a considerable spread between prices received by producers in the north and those received by traders at southern market outlets. The minimum ruling price in southern markets is currently N 0.28/lb liveweight. Thus 700-800 lb steers landed in Lagos or Ibadan are worth N195-225 each. The price received in the north by the producer of such steers will depend on his location, proximity to alternative municipal markets and other factors, but would be expected to be of the order of N 160-180 each. Size and weight (invariably assessed by eye) are the key determinants of price; factors such as age, sex and quality are of lesser importance.

16. Slaughtering is undertaken throughout the country in facilities of various types. These range from crude slab systems, which are by far the most common, to modern plants with processing and chilling capabilities. There is considerable idle capacity in most plants, which can be called upon to meet any increases in throughput likely in the foreseeable future.

17. Land Tenure. Traditionally, land in Nigeria has been communally owned and administered in trust by family or civic heads with the concurrence of local Government Authorities. Customary Laws governing land allocation vary throughout the country, but in general they all confer rights of occupation and use allowing the individual or the group to settle and cultivate the land for a stipulated period. Such rights cannot normally be sold or exchanged between individuals. Federal and State Governments can acquire land for essential purposes on payment of compensation to the traditional owners. Lease of such land can be arranged by nationals for periods up to 99 years. Private companies, both national and expatriate, can acquire land on a leasehold basis from Government.

18. While the farmer prepared to settle and crop the land is reasonably well catered for under customary practice, the nomadic grazier has few land rights, either traditional or legal. Consequently, as population increases and cropping activities intensify, traditional grazing areas are reduced. Government is conscious of this problem and, under the Grazing Reserves Law of 1965, has set aside numerous areas for exclusive use by nomadic graziers. Areas so reserved, however, are proving insufficient and their administration

in some instances is causing difficulties. Government currently is redoubling its efforts in this direction and its attempts to make more land available for grazing under the National Tsetse Clearance Program are evidence of its concern for the problem. Government's intention is to encourage an orderly development of cleared areas and to ensure a balance between cropping, grazing and forestry. With respect to development of the livestock subsector in particular, Government hopes to reduce grazing pressure in the more overgrazed areas of the north by providing permanent grazing reserves and facilities for settlement in the wetter areas to the south. Unfortunately, due to shortage of staff to plan and supervise the work, controlled development of the areas being cleared of tsetse-fly has not taken place so far. In fact, the surveying and gazetting of lands for use solely as grazing reserves has fallen behind schedule and cleared areas are being settled in a haphazard fashion, with the majority of land being taken up by crop farmers. The net effect is to aggravate the state of tension which exists between agriculturist and pastoralist.

19. Taxation. Historically, nomadic producers have been liable to some form of taxation in the districts through which they travelled with their cattle. At the present time throughout Northern Nigeria this takes the form of a standard annual head tax of N 0.75 per adult animal. The tax is known locally as 'Jangali'. It is collected by the local Government Authority (LGA) which retains a portion of the revenue and passes the balance to other state institutions. The distribution of the tax varies from state to state. In one northern state it is subdivided as follows: LGA 30%; State Government 25%; Local Education Authority 25%; Area Development Board 20%. In another state LGA retains 75% and passes 25% to the State Government.

20. Jangali is unpopular with livestock producers and they do everything to avoid it. An obvious way is to prevent a true count of their cattle being made, and to this end every conceivable ruse is employed. The deception is comparatively successful as it is recognized officially that only 50-60% of revenues due are collected. This conflict also produces serious side effects. For example, accurate national cattle figures are impossible to obtain when the make-up of individual herds is so distorted. Again, measures taken to enforce tax collection make the Fulani suspicious and withdrawn and hence very difficult to work with from an extension point of view. There is no doubt such reactions greatly prejudiced the success of the several USAID efforts to establish viable group ranching schemes throughout northern Nigeria in the 1960's.

21. Attempts have been made to have the tax revoked. But since it represents an important revenue source for LGA, state governments and other local bodies, its presence must be accepted until the alternatives can be studied.

22. Elements of Strategy. Any attempts to improve cattle management and production must aim at maintaining and improving the offtake from the traditional herd as well as developing new intensive methods of production. As a first step, more rational exploitation of areas being cleared of tsetse-

fly by the National Program has to be achieved. At the same time, the economic feasibility of improved methods of production, particularly under commercial ranching conditions, must be demonstrated. The major problems to be overcome in such undertakings are expected to be political and administrative rather than technical and economic.

23. The National Tsetse Clearance Program has already eradicated flies from some 35,000 sq mi in the north and the program provides for the clearance of an additional 65,000 sq mi during the next 15 years. Obviously, this will result in a substantial increase in available grazing which will support a considerably expanded traditional herd. However, it will be some years before this is translated into an increased offtake of cattle for slaughter. Under the present system of livestock management, the rate at which the herd can be expanded is relatively slow (some 2% per year) because of low fertility and high mortality rates. Efforts must be made to increase the rate of herd build-up by better nutrition, veterinary hygiene and general management. Such improvements can only be expected to come about slowly and depend on a more direct dialogue with Fulani producers, the development of well controlled grazing reserves, and the introduction of improved extensive ranching techniques through demonstration and extension. At the same time efforts must be made to encourage the establishment and expansion of beef production in the non traditional subsector. There is mounting interest among farmers in more diversified farming systems involving integration of cropping with livestock and grassland production. More practical research needs to be undertaken on such combinations, and increased emphasis must be given to evolving systems applicable to the various ecological zones of the country. The lead must be taken by Government.

24. In the short term, a measure which could have a far reaching impact on beef supplies is the fattening of cattle now marketed in poor condition from the traditional herds. Almost without exception cattle are now slaughtered at weights well below their mature potential because almost no effort is made to market them in finished condition. There are no well established intermediate fattening operations between grazing areas and terminal markets. There are no obvious technical or economic reasons why animals now slaughtered should not be at least 100 lb heavier on the average -- yielding some 25,000 tons of additional carcass weight per year for little extra investment, time and trouble. Studies and demonstration of such possibilities are urgently needed in order to prevent further squandering of such a valuable resource. The little "fattening" that is now done is relatively ineffective, usually being based on an arrangement between livestock traders and individuals who hold cattle on crop residues and feed some by-products such as cottonseed and bran. The program is carried out without extension assistance or veterinary control and can be regarded at best as a holding rather than a fattening operation. Fattening of cattle on improved pastures near terminal markets in the north and south represents an attractive possibility, although there could be problems in the south related to the susceptibility of northern cattle to trypanosomiasis and streptothricosis. Control of the former through drug treatment appears reasonably assured, but much further work is required to ensure protection against the latter. Studies along these lines and those suggested above are obviously needed and must be given priority in any program to modernize and expand Nigeria's beef cattle industry.

Table 1. SECOND NATIONAL DEVELOPMENT PLAN

	Public Sector Capital Investment (N Million)	% total	Annual % Real Increase in Gross Domestic Product %
Agriculture	265.4	13	1.8
Transport	485.2	24	3.0
Mining	5.2	-	37.0
Industry	172.2	8	14.3
Education	277.8	14	6.0
All other	845.0	41	4.1
Total Plan	2,050.8	100	6.2

Source: Second National Development Plan, Chapter 27, Table 5 and Chapter 6, Table 7.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

The Fulani and the Traditional Livestock Sub-Sector

A. Introduction

1. The six northern states contain approximately 90% of Nigeria's cattle population, estimated at around 10 million head. The Fulani, an ethnic group with their own language and culture have been herd-owners for many centuries. It is estimated that they own some 85% of the total cattle in Nigeria, the balance being held by Kanuri and Shuwa peoples whose system of management and way of life do not differ appreciably from the Fulani. Historically the Fulani have been a neglected society and as a small minority (approximately 3% of the total population of the northern states) in a harsh physical environment, mere survival has long been a constant challenge. Thus, psychologically and in their value system they have been uniquely conditioned. In their cultural orientation the Fulani are strongly traditionalist. They tend to believe in a "steady state" theory of culture and feel that there is only one correct way to live - precisely as their forebears did through the generations. To resist assimilation with the numerically dominant Hausa and culture change generally, they have developed strong ethnocentric attitudes. Like nomads elsewhere, they have a strongly independent personality fostered by their mobility. Thus, if there is coercion, threats, or any form of unpleasantness - real or imagined - they will flee. They are fully aware that compared with sedentary people their life is grueling and in order to avoid losing members to sedentarism they maintain an elaborate propaganda which extols the Fulani life style and the value of cattle, while denigrating all that is non-Fulani. The Fulani passion for their cattle is well known and observers have noted their reluctance to market them. The cattle are also milked and the sale of milk and milk products helps meet day to day living expenses. Cattle are normally sold only to meet the most pressing needs such as payment of cattle tax, crop damage fines, marriage expenses and family needs. Until recent times Fulani have expressed little interest in factory produced consumer goods. However, some are now buying items such as raincoats, shoes, transistors, knives, wrist watches, beer, and metal utensils. It is likely that this trend, especially if stimulated through extension, will increase and lead to a more commercial attitude in the long run.

B. Social Organization

2. The Family-Household. The basic Fulani herd-owning and tending unit is the simple or compound family: a man and his wife (or wives) and their children. Occasionally one or more other kin or non-kin Fulani may reside with a family, thus enlarging the household. The family-household averages

5 - 6 individuals and 80% of all such groups fall in the range of 3 - 7 individuals. Family households depend on herds averaging 30 beasts, 70% being herds in the range of 10 to 50 head.

3. Nomadic Fulani family-households cluster in groups to form camps. Such camps may vary in size and composition during the annual cycle. Examination of these camps reveals two basic types.

(a) Kin-based Residential Units. In the 19th century (and presumably earlier), practically all Fulani lived in camps of around 20 to 40 households. The household heads in these camps could trace kinship links to a common ancestor. A camp was under the leadership of a senior genealogically qualified male (regionally variously called ruga, ardo, dikko, jonwuro, magaji, laniido, sarkin) who was in fact a named lineage. The camp was strongly corporate through its full range of social, political and economic activities.

(b) Nonkin Units. Today, most Fulani prefer to live in co-residential units as large as local pastures and water supply will allow. The maximum camp size under the most favorable conditions is about 30 huts (180 people, 900 cattle). Fulani household heads always have a rationale for co-residence in camps. In recent decades two types of non-kin camps have emerged:

(i) camps because of grass ("gam fudo"); these are usually temporary dry-season aggregates at the southern limit of migration and formed near lush pastures. They are camps of convenience. "It is better to camp with a stranger than alone."

(ii) camps because of friendship ("gam higotiragu"); these are avant-garde herdsmen who in camping together give expression to the modern view that bonds of friendship can be comparable with bonds of kinship.

4. It should be noted that neither of the latter two camp types have the temporal stability of the kin-based camp and also their leadership is usually weak. However, if ideal pastoral conditions can be provided a strong corporate sense would be expected to emerge in time as the traditional nomadic system becomes increasingly threatened owing to land pressure. In general, the Fulani reaction to these pressures as an ethnic and occupational group is to develop a stronger sense of unity and a mood of cooperation in their own ranks.

C. Pattern of Transhumance

5. General. The Fulani are described as nomadic or semi-nomadic but this can be misleading since over the centuries varying degrees of settlement have developed and for the majority "migratory" would provide a more apt description. The extent of settlement amongst Fulani varies widely between areas but informed estimates have suggested that overall some 20 - 25% of cattle belong to settled owners, 30 - 35% to semisettled and 40 - 50% to nomadic peoples. Settled cattle owners include those who live in large towns, villages or more densely populated districts. Their cattle are generally herded on local grazing areas and during the dry season they obtain some feed by browsing crop residues on their own and neighbouring farmlands. So long as cattle can be fed in close proximity to the town, the owner can expect an income from milk sales and, for some months of the dry season, a limited benefit from the manure deposited on his farm during stubble grazing. The settled group also includes traditional cattle-owning peoples outside the urban areas who over the years have developed a degree of dependence on settlement and farming.

6. The seminomadic group of owners are those who generally retain a homestead as a base in their wet season grazing areas and during this time plant some limited food crops. In the dry season they leave for the better grazing of the higher rainfall areas, often leaving behind part of their herd, usually cows and calves, near the homestead together with the older family members and young children.

7. The so called nomadic peoples are those with no fixed abode. They represent the majority and are almost constantly on the move with their cattle. Movement is governed principally by the need to secure the best grazing and lowest tsetse challenge. Even amongst these peoples there is some limited and sporadic crop growing, usually a little short season millet, when circumstances force the nomad to supplement his income or his family food supply.

8. Management and Cattle Movement. Notwithstanding the varying patterns of settlement of the cattle owners, the systems of animal husbandry adopted and the traditional approach to cattle ownership is essentially the same. Ownership of cattle serves not only to provide a living, mainly through sales of milk, but the size of the herd confers a degree of prestige on the owner and basically represents his total wealth. Numbers therefore assume importance and a high premium is placed on the breeding female. In general, slaughter offtake is confined to the immediate needs for cash. There is a complete dependence on available natural grazing as cattle owners make no attempt at pasture improvement. Any management techniques adopted are largely aimed at what may benefit the herd in the short term rather than any long term maintenance of grazing capacity. The Fulani has an intimate knowledge of the needs of his cattle and is fully aware of the deficiencies in the quality of dry season herbage. Consequently, full use is made of crop residues in the early dry season. The non-cattle owning farmer generally welcomes, because of the

benefits of manure, cattle grazing on his stubble or being confined overnight on his land. He often makes some form of payment to the cattle owner for this, either in the form of food or an equivalent amount in cash.

9. The basic transhumant movement is southward in the dry season (November to April) and northward in the wet season (May to October). The seasonal movement of cattle is largely dictated by environmental factors, the Fulani herdsman's movements being dictated by the need to provide adequate grazing and water for his stock and to avoid the tsetse areas. He is skilled at maintaining this delicate balance and utilizing his detailed knowledge of conditions over vast areas. In broad terms the animal migratory movement is as follows:

(a) During the wet season (May-October) the herds, confined to the tsetse free Sudan zone in the north, are in good condition with adequate grazing. The family unit is together and even amongst nomadic herds camp movements are limited. Cultivated land has to be avoided as crops are growing.

(b) After the rains, in late November-December, natural surface water in the north dries up and available grazing decreases rapidly. Those cattle to be moved to the Guinea zone start the seasonal trek to the south, grazing crop residues and swamp areas en route.

(c) In the mid-dry season (January-February) the trek southwards continues. In the north both grazing and crop residues are limited, as are water supplies, but the seasonal destocking has taken place. Those moving south complete the journey. This is the coolest time of year (Harmattan) and temperatures and humidity gradually increase during the late dry season (March to April) at which time crop residues are exhausted and bush-fires have destroyed much of the remaining upland grazing. This is the most difficult time of year for both herd and herder.

(d) The early rains (April-May) are marked by sporadic thunder-storms and during this period the movement back north to the wet season grazing areas and homesteads takes place, to recommence the cycle.

10. Herds normally set out on a predetermined route that is followed annually, although over the years the pattern will alter as changes take place in the availability of grazing areas or in the boundaries of G. Morsitans belts. There is wide variation between herds in the actual distances covered during the migration but herd movements of between 200-250 miles in one direction are common. Indigenous cattle are well adapted to the harsh environment and the Fulani exploits natural conditions in a management system which requires no capital investment. The system is largely an adaptation to ensure

survival and herd productive performance is low. The fertility rate is around 40-50%, mortality is 10-20% for calves and 4-10% for adults, and growth to maturity takes 4-5 years. However, it is felt that even these low levels of production cannot be maintained indefinitely. The traditional pastoralist system is being progressively threatened by pressure on land arising from increasing human population, increased farming activity and by the pressure of increasing cattle concentrations on shrinking grazing areas. In the wet-season grazing areas, progressively larger acreages are being taken over for cultivation. In some cases the resulting concentration of cattle on remaining grasslands has caused severe overgrazing. The National Tsetse Clearance Program is doing little to assist this situation as land cleared of tsetse is being utilized in a haphazard fashion. Both croppers and graziers are moving in and the former are laying claim to the majority of land by physical cultivation; the unsettled pastoralist is being given little recognition, in accordance with traditional land tenure customs.

D. Present Situation

11. There is an urgent need, in the national interest to reduce these pressures on the traditional cattle sector and increase overall productive performance. To achieve this, land must be set aside for the pastoralist and improved management techniques imposed. This implies a change to a more settled form of husbandry as a step towards a stratification of the cattle industry. This presents major technical and sociological problems. From the sociological viewpoint much has been written and said regarding the Fulani's reluctance to sell cattle and his lack of commercial approach to cattle ownership. An over-simplified explanation is that traditionally the Fulani scorns farming or any form of manual labor, that he is not interested in material wealth in the form of consumer goods or in education, that his life revolves around his cattle which for him confer a degree of status determined by the total number rather than the quality of the cattle he owns. Thus by his own standards he has no reason to sell cattle unless circumstances force him to do so. To this explanation is added the belief that nomadism as a way of life has its attractions and that it is in some way an inherited characteristic of the peoples who practice it.

12. Whilst there may be varying degrees of truth in these statements, there is ample evidence that changes from the purely nomadic life have been made over the long term where circumstances have forced them or made them desirable for the individual. Where it has fitted in with his needs the Fulani has responded well to what, by his own standards, are "revolutionary techniques", as is evidenced by his acceptance of vaccination and veterinary health programs.

13. A review of the present situation in Nigeria indicates that major needs of the Fulani are:

- adequate feed for his stock throughout the year;
- adequate water supplies;
- veterinary attention for his stock; and
- extension services.

In terms of improving beef production these are essential and their provision forms the basis of these components of the Project directed towards improvement of the traditional industry. Under the Project, two separate approaches would be employed (a) provision of basic physical inputs (water, roads, firebreaks and such) on land being cleared by the National Tsetse Program to allow rational exploitation of the natural grassland areas, and (b) establishment of selected improved pastures on the Kukar Jangarai Reserve (which has already been provided with the basic physical inputs under an earlier USAID program).

14. Under (a) above, some 1,600 sq mi would be involved. The areas would be developed in units of approximately 100 sq mi (i.e. 64,000 ac) with four units being completed in PY 2, seven units in PY 3 and five units in PY 4. Investments would be in firebreaks and roads, water development, stock-handling facilities, housing and vehicles and equipment. The housing and vehicles would provide accommodation and transport for the Range Development Officer (of which there would be one per unit) and his staff. After establishment, the stocking on each unit would be carefully controlled to prevent overgrazing and to ensure the most efficient management and rational exploitation of the unit. In addition to grazing privileges, herdsmen would be provided with dipping facilities and veterinary drugs and vaccines for their cattle and in return would be expected to pay a nominal grazing fee for the package of services of N 0.5/AU/yr.

15. Under (b) (para. 13), the Project would establish 1,500 ac of improved pasture - 500 ac/yr in PY 2 to 4 - for the purpose of demonstrating to local traditional producers the value of such pastures in improving total bulk and quality of feed and in providing a more even seasonal distribution of fodder. Such a development would be a logical follow-on from earlier USAID efforts in the Reserve to provide water, roading and firebreaks to facilitate controlled exploitation of the natural grassland of the area. At the present time the 300,000 ac Reserve is carrying some 40,000 animals in the wet season and 6,000 animals in the dry season and can be considered to have reached its potential carrying capacity given present inputs. The present efforts would be directed not only to increasing the total dry matter produced from the Reserve, and hence its carrying capacity, but to introducing modern concepts of pasture production and animal management to the traditional sector. Of central importance in ensuring the success of the program would be the procurement of suitable cultivars of Cenchrus ciliaris, Setaria sphacelata and Stylosanthes spp. adapted to the zone and the use of phosphate fertilizer which would be used annually and on a continuing basis to ensure adequate legume vigor. After establishment, subsequent management would emphasize sound grazing and stocking practices, control of stock being achieved through minimum inputs of fencing. In addition to being offered access to improved pasture, herdsmen would be provided with dipping facilities and veterinary services for their cattle for which they would be charged a grazing fee of N 0.2/AU/mth.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Cattle Health Situation

1. The Veterinary Divisions of the various State Government Ministries of Agriculture are responsible for animal health measures. They generally are adequately staffed and financed to carry out this task satisfactorily. Animal health control has improved steadily over the years. Nonetheless, most of the common West African animal diseases remain endemic to Nigeria as well as to its neighboring countries. The following cattle diseases are of major commercial importance.

2. **Rinderpest.** Rinderpest formerly was the most important epizootic disease, but due to the JP 15 antirinderpest campaign carried out in Nigeria from 1962 to 1966, its incidence has been greatly reduced. Outbreaks still occur in Nigeria as well as in neighboring countries and the disease remains a major potential threat to the country's cattle population. Rinderpest would not be a danger to the project since all project cattle would be vaccinated against the disease on a routine basis.

3. **Trypanosomiasis.** Trypanosomiasis is regarded as the most serious disease now confronting the cattle industry. There is evidence, however, that its importance as a production constraint may have been exaggerated. In many cases lack of proper diagnostic services and ignorance on the part of herd owners has resulted in deaths being attributed to the disease when they have been due to other causes. Consequently, commonly heard statements such as "White Fulani cattle cannot survive in the south due to high tsetse challenge", need reevaluation in the light of the evidence that some graziers now seem to be keeping zebu cattle satisfactorily in areas considered heavily infested.

4. Government has taken active steps to eradicate tsetse-fly in the north. Over the last 20 years the Tsetse and Trypanosomiasis Division (TTD) of the Federal Livestock Department and its precursors have developed a well-staffed and well-equipped organization that has been able to execute successfully an extensive Tsetse Clearance Program. The Clearance Program is aimed at eradicating the fly from some 100,000 sq mi of the Sudan, sub-Sudan and Guinea zones of the northern states. To date, some 35,000 sq mi have been cleared and the Program is expected to complete its work in the next 15 years.

5. In the south tsetse-fly eradication is much more expensive due to higher rainfall and greater vegetative growth and at present is uneconomic. Thus, an increase in beef production in the south will, for the short and medium term at least, depend on trypano-tolerant cattle such as the N'Dama, West-African Shorthorn type breeds (Muturu and Keteku). Provided the location

of beef cattle enterprises using these breeds is well selected and chemoprophylatic and curative treatments are used as necessary, trypanosomiasis should not be a constraint on developing a cattle industry in the south.

6. Contagious Bovine Pleuropneumonia (CBPP). CBPP is endemic to Northern Nigeria, but the W State and generally speaking areas south of 9° North appear now to be free of the disease. CBPP will remain a serious potential danger as long as there are enzootic areas, uncontrolled cattle movements, and unwillingness on the part of cattle owners to report outbreaks. At present relatively few cattle, and usually these are those under stress - for example trekking cattle - succumb to the disease.

7. For many years the Animal Health Services have tried eradication of CBPP by slaughtering all cattle in infested zones and compensating cattle owners for their losses. During the last few years, however, outbreaks have increased steadily, and the slaughter policy has become excessively costly. The Animal Health Services have now switched to vaccination. Supplies of vaccines were a problem until recently, but the Federal Department of Veterinary Research at Vom has increased production in anticipation of a national eradication program which started in 1973.

8. All project cattle would be vaccinated against CBPP (Zebus once and Taurins - N'Dama, Keteku and Muturu-twice a year). Purchased cattle would be subject to vaccination and quarantine, the effects of which would be:

a. a reaction disrupting weight increase for several days, and

b. distinctive crisis effects among CBPP symptom-free carriers, allowing such carriers to be recognized and eliminated.

9. Streptothricosis. Streptothricosis (a skin disease) is endemic throughout the country and is likely to be an increasing problem in efforts to intensify cattle production in the wetter Guinean areas. Taurin cattle have a high degree of tolerance to the disease, but zebus are very susceptible to it. The worst cases of streptothricosis are seen in the wetter south in zebus driven from the north enroute to market.

10. Streptothricosis remains a major problem since no effective treatment exists that can be used on a large scale. The use of high doses of penicillin-streptomycine has been successful but such treatments are expensive and uneconomic except in special cases, such as the treatment of draft oxen. Reasonable results have been obtained with cheaper dipping or spraying using insecticides and, if necessary, arsenic drugs and/or quarternary ammonium; all project cattle would be so treated until alternative and more effective treatments are developed.

11. The Farcha Livestock Institute at N'djamena, Chad, is working on a vaccine for streptothricosis, and initial results have been encouraging. Development of an effective vaccine would radically change the situation since it would be more efficient and less expensive than either prophylatic or curative treatments.

12. Helminthiasis. Helminthiasis (worms) is serious and widespread throughout Nigeria. It is a major cause of unthriftiness and mortality, particularly in young stock. The widespread nature of the disease is encouraged by traditional husbandry practices whereby animals are constantly on the move in herds during the day and concentrated in confined areas at night. Helminthiasis is more serious in the higher rainfall areas of the south than in the north. At present very little control is practiced but development of the cattle industry will require the use of control measures with anthelmintics.

13. Other Diseases. Other diseases of lesser importance include blackleg, anthrax and haemorrhagic septicaemia. Outbreaks generally are sporadic and appropriate vaccines are available. Brucellosis and tuberculosis have been identified and could become more prevalent with the intensification of cattle production. Foot-and-mouth disease occurs from time to time though in a fairly mild form. Tick-borne diseases such as anaplasmosis, babeseliosis and piroplasmosis are known but are not regarded as a serious constraint since they can be controlled by regular spraying and dipping. Rabies is prevalent throughout the country.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Livestock Supporting Services

1. General Organization. Responsibility for the development of agriculture and livestock throughout Nigeria is essentially a state function, although the Federal Government is involved in matters of policy, in establishing priorities, and in coordination at the national level. Each State Government discharges its responsibility through its Ministry of Agriculture and Natural Resources. The organization within each State varies somewhat. Broadly, in the six northern States both animal health and production are under the Veterinary Divisions, whereas in the southern States animal health is the responsibility of the Veterinary Divisions and livestock production of the Agricultural Divisions. Federal control is exercised through the Federal Ministry of Agriculture and Natural Resources (FMANR), which was created in 1965 to promote and coordinate natural resource research and development at the national level. Development policy has been made the responsibility of the National Council for Agriculture and Natural Resources, which was set up in 1970 specifically to advise Federal and State Administrations on overall policy and planning matters and to make recommendations on priorities and financing in the fields of Agriculture and Natural Resources. The Council is served by separate technical committees embracing Agriculture, Fisheries, Forestry and Livestock.

2. The Federal Livestock Department (FLD). Programs of FMANR are effected through its six departments covering Agriculture, Fisheries, Forestry, Meteorology, Research and Livestock (FLD). The function of FLD is to coordinate and implement livestock development at the national level. In addition, it acts as a liaison between the Federal Government and outside bodies in all livestock matters. It is organized into four divisions as follows: (i) Tsetse and Trypanosomiasis (TTD), (2) Veterinary Public and Animal Health (VPAH), (3) Planning, and (4) Federal Leather Institute.

3. TTD, established over 20 years ago under the former Northern Region Administration, is a well-staffed, well equipped and effective organization. It is successfully executing an extensive National Tsetse Clearance Program. This Program is aimed at eradicating fly infestation from some 100,000 sq. mi. in the Sudan, sub-Sudan and Guinea zones of the northern states to allow use of the land on a permanent basis. To date, some 35,000 sq. mi. have been successfully cleared and the Program is expected to complete its work in the course of the next 15 years. In addition, TTD undertakes investigations of animal trypanosomiasis and advises the States on treatment techniques and policy.

4. The Veterinary Division is an advisory and regulatory body concerned with standards of food hygiene and veterinary public health. Amongst its responsibilities, the Division controls meat inspection at slaughterhouses in all major cities throughout the country.

5. Extension Services. The infrastructure for agricultural and livestock extension work is well established and staff on the whole appears to be numerically fairly adequate. Veterinary health services are also well developed and major diseases are generally under adequate control. One problem presenting itself, however, concerns the orientation of animal production work in general. It appears that a much more practical approach has to be given this work and recognition accorded the fact that production work per se is better left in the hands of agricultural or veterinary graduates with specialist training in production techniques than in the the hands of general agricultural or veterinary graduates. The training of the latter, as presently oriented in Nigeria, does not provide a strong enough background in husbandry and production to allow them to function adequately in central roles in the execution of commercial livestock production projects.

6. Besides the need to strengthen animal production work, State Ministries need to give greater emphasis to extension activities and range management. In fact, the start that has been made to train individuals in the latter area requires considerable expansion to fill the very pressing need throughout the country for range management expertise. At the same time, more attention needs to be given the choice of overseas training centers to which candidates are sent. In the past many have been sent to centers located in countries where conditions are completely different from those in Nigeria and the training acquired has been of limited benefit. In this respect, much greater use needs to be made in future of training institutions throughout northern Australia where ecological conditions are very similar to much of Nigeria and where the science of range management is very advanced.

7. A neglected area and one requiring urgent attention concerns livestock extension courses for farmers. These should take the form of practical field demonstrations and lectures in improved nutrition and management and serve to introduce newer concepts of husbandry and livestock production techniques. Farmers are interested in these possibilities, and much of the infrastructure necessary for the organization of such demonstrations and field days is already present. It would require only quite modest budgetary outlays and organizational skills to implement demonstrations at existing centers in key livestock producing areas throughout the country.

8. Research. The infrastructure for agricultural research in Nigeria is, generally speaking, very adequate. Research in livestock is undertaken by various agencies of the Federal Government and by the universities. State-government agencies in general are not involved in research to any significant extent at present, although modest programs are being undertaken by the Western State at Moor Plantation and Fashola and by the East Central State

at Umdike. There are, however, indications that several of the State Governments are interested in becoming more involved in the future, particularly in applied research undertakings. This is encouraging since, taking into account the size of Nigeria and the considerable variation in its ecology, it is questionable whether the Federal Government and the universities can provide the depth of research, and the detailed work necessary at the applied level, to allow development of livestock industries quickly and efficiently in the individual states.

9. Federal agencies concerned with research in animal health and production are :

The Federal Department of Agricultural Research, Ibadan.

The Nigerian Institute of Trypanosomiasis Research, Kaduna and Vom.

The Federal Department of Veterinary Research, Vom.

The latter institution, as well as undertaking livestock research, is responsible for the production of all livestock vaccines needed in Nigeria.

10. Universities with programs in livestock research include Ibadan, Ife, Nsukka and Ahmadu Bello. In general, livestock work undertaken by the universities, while of good quality, lacks production orientation and thus is not serving to provide solutions to the real problems confronting the livestock industry. An exception to this is the work being undertaken by the Institute of Agricultural Research (Ahmadu Bello University) at Shika, which traditionally has adopted a much more pragmatic approach in its programs and has been particularly successful in integrating grassland and livestock research in a very effective manner. More of this type of work is needed. A better balance needs to be struck in the future between this approach, the earlier emphasis given to disease control studies by federal institutions, and the academic studies being made by university Departments of Animal Science.

11. In the context of research orientation, the Federal Government has a key role to play through FMANR, the National Agricultural Research Council and the various development committees of the National Council for Agriculture and Natural Resources. These federal agencies are in a unique position to determine not only overall development strategy but, through the deployment of their substantial budgets, the priority and emphasis given research and development undertakings in the field of livestock production.

12. Education and Training. Training facilities in agriculture and veterinary science are available at a number of institutions throughout the country; in this respect, Nigeria is comparatively well off. Degree-level training in agriculture is offered at the universities of Ife, Nsukka, Ibadan and Ahmadu Bello. The latter two institutions also provide degree programs in veterinary science. At present, some 40 veterinarians and 100 agriculturalists qualify for degrees each year. This is a substantial output and

facilities for increasing these numbers are available. In addition two-year agricultural diploma courses are offered at five centers (Akure, Ibadan, Samaru, Kabba, Umadike). Similar diplomas are offered in animal health at the Federal Veterinary School, Vom. Currently, over 300 agricultural technicians and some 50 veterinary technicians receive the diploma each year.

13. The general quality of graduates and diplomates in agriculture and veterinary science is acceptable. It appears, however, that more practical work is required in all programs to offset the undue emphasis on book learning. All too often students finish their courses with insufficient practical experience and without adequate orientation in the real problems existing in the fields in which they are to work. Further, the development of a practical attitude to their profession, and the ability to define problems in simple terms and provide straight-forward practical solutions, are not sufficiently encouraged in agricultural and veterinary students in Nigeria at the present time. These shortcomings are serious and require correction if Nigeria is to make the best of its agricultural potential.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Agricultural Credit

1. Introduction. Agricultural credit is poorly developed in Nigeria. Whenever credit institutions have been established they have been hampered in most cases by political interference, weak management and cumbersome procedures.

2. Sources of Agricultural Credit. Most agricultural credit comes from local moneylenders, friends, and relatives and is generally short-term and sometimes in kind. Credit institutions have not been successful in Nigeria. Several regional credit agencies have been established in the past 20-30 years, but only two remain; one, in the Mid-West State, is primarily concerned with the collection of old debts; the other, in Western State, has recently started a more active credit program making loans of up to seven years to companies and individuals (mainly for the production of cash crops) with loan supervision by the Corporation's field staff.

3. Also in the Western State, the State Government-sponsored National Bank has made a few medium-term loans (four years) for livestock, but has had little impact on production levels. More successfully, the Nigerian Tobacco Company (NTC) finances the production of fluecured tobacco by family farms on a small scale. Short and medium-term loans up to four years to tobacco farmers are disbursed through the commercial banks on the security of a lien held by NTC over the farmer's production.

4. In the north, there are some very small credit programs operated by the States for the supply of fertilizer; a small but successful program, administered by Local Authorities, provides farmers with animal drawn plows.

5. Until 1969/70 the commercial banks made loans, guaranteed by Government, to the marketing boards and their Licensed Buying Agents (LBA). Subsequently, a new Federal law designated the Central Bank to handle all the credit requirements of the marketing boards and withdrew Government guarantees for loans to LBA's. The commercial banks now play little part in agricultural lending, which in June 1971 represented only 2.5% of their total outstandings. Short-term crop loans are made to well secured borrowers and senior civil servants; lending for livestock production is insignificant. These banks have been very conservative, with strict collateral requirements for agricultural borrowers.

6. Interest Rates. The Central Bank has a minimum rediscount rate of 4 1/2%; it lends to the Marketing Boards at 6%. The commercial banks' prime

lending rate, usually 2 1/2 points above the rediscount rate, is presently 7%. Short and medium-term loans are made to well-secured commercial borrowers at 8-8 1/2% and 8 1/2-9% respectively; medium-term loans to small and medium-sized traders are made by some commercial banks at 10-12%. Moneylenders commonly charge rates of interest in the range 24-50%.

7. Demand for Agricultural Credit. Demand in the past has come largely from the regional or state marketing boards, and their LBA, who make preseason advances to farmers growing those crops covered by the marketing boards.

8. More recently, however, there has been increased demand for credit from cattle farmers and traders, who presently lack adequate holding/fattening facilities and are compelled to sell off cattle quickly rather than hold and finish them to higher weights. In the southern States both livestock production and mixed farming have attracted entrepreneurs and led to a rapid growth in credit demand which is at present unsatisfied. There is ample scope for further increase in demand if the returns on agricultural investment can be improved. Mechanization is in its infancy, and even a change from the ubiquitous hand hoe to simple animal-drawn implements would produce a large credit demand. Rehabilitation schemes for tree crops (which would include improved plants and fertilizer application) and production improvement plans for annual export and food crops (which would include fertilizer and improved seeds) would also generate demand. A more general increase in demand could be brought about by improvements in extension services, the distribution of inputs and marketing arrangements.

9. Central Bank Guidelines. One of the Government's instruments for directing credit to the agricultural sector is the annual directive issued by the Central Bank to the commercial banks. These guidelines are designed to control the rate of expansion of credit in the economy and its allocation. The 1971 guidelines specified an 8.5% growth in total advances over the comparable months in 1970. By June 1971, however, the credit outstanding was 68% greater than in June 1970 (Table 1). Agricultural lending, which in June 1970 represented only 2% of total outstandings, was programmed for a 150% increase in 1971 (from N 13.42 million), which would have given the sector a 5% share of the total. In fact, agricultural lending only increased to N 10.82 million and its share of the total to 2.5%.

10. The guidelines for the period April 1, 1972 to March 31, 1973 emphasized the allocation rather than the rate of expansion of credit. Commercial banks were directed to channel 4% of their total loans and advances to agricultural production (see Table 2) by March 31, 1973, although they expected that even this would not be easy to attain. In addition, they were expected to allocate a minimum of 40% (compared with 35% previously) of their total loans and advances to businesses in which Nigerian nationals retain 51% or more of the ownership.

11. However, the Central Bank guidelines for agricultural lending and the gradual recognition of agriculture's potential have made the commercial banks interested in participating in a livestock development project either as agents of the Government, or as joint financiers with Government. They are prepared to provide short-term working capital requirements and some longer-term loan funds for up to five years or more. Although still cautious, they acknowledge that, given the support of adequate technical services, recognized land occupancy rights together with a lien over livestock could represent adequate security for livestock development loans.

12. Nigerian Agricultural Bank. Government's most important step towards the development of agricultural credit has been the creation of the Nigerian Agricultural Bank (NAB). This would be the first Federal institution organized solely to provide finance for agriculture. NAB was registered under the Companies Act in November 1972; it was officially inaugurated in early 1973. Government is to provide N 12 million from Federal funds - N 1.0 million as share capital and the balance as a long term loan. The main objects of the NAB are set out in its Memorandum of Association as follows:

"(a) To grant loans for agricultural production (including horticulture, poultry farming, pig breeding, fisheries, forestry and timber production, animal husbandry and any other type of farming) and for purposes of storage, distribution and marketing connected with such production to any state, group of states or any state institution for on-lending to any farmer, group of farmers, or body corporate, subject to the state or group of states or state institution guaranteeing repayment of the loan.

(b) To grant direct loans to individual farmers, cooperative societies or other bodies (corporate or unincorporate) in appropriate cases, provided that the bank is satisfied that the schemes for which the loans are requested are viable and there is adequate security to cover such loans.

(c) To charge interest on loans to meet the full costs of management including debt servicing, allowing adequate sums to be set aside for general and bad debts reserves before paying any dividend."

Government expects NAB to play a major role in agriculture and in the development of credit institutions in the States.

13. IBRD has worked closely with the Government in planning the establishment of NAB, and is the executing agency for a UNDP/SF project under which a consultancy firm is providing a senior management team in the early years.

14. NAB would be the main credit channel for the proposed livestock project. Its head office will be in Kaduna, an important agricultural center, which is also proposed as the location of the Livestock Project Unit to be set up in the Federal Livestock Department.

ANNEX 5
Table 1

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Outstanding Credit (N Millions)

	June 1970 Actual	Guidelines	June 1971 Actual	Excess of Actual over Guidelines %
Agriculture, Forestry & Fishing	5.28	13.42	10.82	-20.4
Manufacturing, Mining & Construction	72.84	88.22	168.02	90.7
General Commerce	111.20	117.02	168.42	43.9
Services	13.72	15.22	26.22	71.6
Others	40.08	26.62	64.62	142.5
TOTAL	243.12	260.50	438.10	68.1

ANNEX 5
Table 2

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Central Bank Credit Guideline

April 1, 1972 to March 31, 1973

	Sector	Percentage Share of Total Loans & Advances
(a)	Production	45.0
	Agriculture	4.0
	Mining	4.0
	Manufacturing	30.0
	Real Estate and Construction	7.0
(b)	General Commerce	32.0
	Exports	10.0
	Imports	10.0
	Domestic Trade	10.0
	Bills Discounted	2.0
(c)	Services	11.0
	Public Utilities	3.0
	Transportation and Communication	8.0
(d)	Others	12.0
	Credit and Financial Institutions	1.0
	Government	2.0
	Personal and Professional	6.0
	Miscellaneous	3.0
	TOTAL (a-d)	100.0

NICARAGUA

LIVESTOCK DEVELOPMENT PROJECT

MELO Ranches

Darase Ranch - 2,500 ac

Herd Projection

	Before Development	End of Project Year 2	3	4	5	6	7	8-21
HERD COMPOSITION								
Bulls	3	8	10	10	12	12	12	12
Breeding Cows	51	259	363	376	400	400	400	400
Weaners	25	25	129	218	263	300	300	300
Heifers 9-24 months	12	12	12	63	107	129	147	147
Steers/Bulls 9-24 months	12	12	12	63	107	129	147	147
Heifers 2-3 years	11	11	11	-	-	-	-	-
Steers/Bulls 2-3 years	11	11	11	11	62	30	-	-
Total Animals	125	338	548	741	951	1,000	1,006	1,006
Total Animals Units, AU 1/	100	313	419	523	688	700	706	706
PURCHASES								
Bulls	1	6	3	2	3	3	4	4
In-Calf Cows/Heifers	-	200	100	-	-	-	-	-
Total Purchases	1	206	103	2	3	3	4	4
MORTALITY								
Bulls	1	1	1	1	-	1	1	1
Breeding Cows	2	2	7	8	8	8	8	8
Weaners	1	1	1	3	4	5	6	6
Heifers 9-24 months	1	1	1	1	1	2	3	3
Steers/Bulls 9-24 months	1	1	1	1	1	2	3	3
Heifers 2-3 years	1	1	-	1	-	-	-	-
Steers/Bulls 2-3 years	1	1	1	1	-	1	1	-
Total mortality	8	8	12	16	14	19	22	21
SALES								
Cull Bulls	-	-	-	1	1	2	3	3
Cull Cows	5	-	-	-	20	20	40	40
Heifers 2-3 years	-	-	-	-	10	77	78	96
Steers/Bulls 2-3 years	-	-	-	-	-	38	63	72
Heifers 3-4 years	3	-	-	-	-	-	-	-
Steers/Bulls 3-4 years	10	10	10	10	11	61	29	-
Breeding Bulls, Ranch Bred, 2-3 years	-	-	-	-	-	37	63	72
Total Sales	18	10	10	11	42	235	276	283
TECHNICAL COEFICIENTS								
Calves Weaned %	50	50	50	60	70	75	75	75
Mortality	3	3	3	2	2	2	2	2
Culling Rate Bulls %	10	0	0	10	10	10	20	20
Culling Rate Cows %	10	0	0	0	5	10	10	10
Culling Rate Heifers 2-3 years	30	0	0	0	0	30	58	67
Bulls % of Breeding Females	3	3	3	3	3	3	3	3
Stocking Rate: acres/AU	25	8	6	4.8	3.6	3.6	3.5	3.5

1/ An Animal Unit is equivalent to an animal of one year of age or more.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NELC Ranches

Bornu Ranch - 60,000 ac

Herd Projection

HERD COMPOSITION	Before Development	End of Project Year 2	3	4	5	6	7	8	9-21
Bulls	22	29	43	54	71	74	82	86	91
Breeding Cows	501	850	1,200	1,600	2,000	2,500	2,500	2,500	2,500
Weaners	250	250	425	720	1,120	1,500	1,875	1,875	1,875
Heifers 9-24	121	121	121	208	353	549	735	919	919
Steers/Bulls 9-24 months	121	121	121	208	353	549	735	919	919
Heifers 2-3 years	117	117	117	-	-	-	-	-	-
Steers/Bulls 2-3 years	117	117	117	119	204	-	-	-	-
Steers, purchased	-	645	2,281	3,311	4,019	3,310	2,933	2,559	2,559
Bulls, Ranch Bred, 2-3 years	-	-	-	-	-	18	15	17	12
Total Animals	1,249	2,250	4,425	6,220	8,120	8,500	8,875	8,875	8,875
Total Animal Units, AU 1/	999	2,000	4,000	5,500	7,000	7,000	7,000	7,000	7,000
PURCHASES									
Bulls	3	8	15	16	23	18	10	10	10
In-calf Cows/Heifers	-	251	263	249	306	390	-	-	-
Steers	-	645	2,281	3,311	4,019	3,310	2,933	2,559	2,559
Total Purchases	3	904	2,559	3,576	4,348	3,718	2,943	2,569	2,569
MORTALITY									
Bulls	1	1	1	1	1	1	2	2	2
Breeding Cows	15	15	26	24	32	40	50	50	50
Weaners	8	8	8	9	14	22	30	37	37
Heifers 9-24 months	4	4	4	2	4	7	11	15	18
Steers/Bulls 9-24 months	4	4	4	2	4	7	11	15	18
Heifers 2-3 years	4	4	4	2	-	-	-	-	-
Steers/Bulls 2-3 years	4	4	4	2	2	4	-	-	-
Steers, purchased	-	-	19	46	66	80	66	59	45
Total Mortality	40	40	70	88	123	161	170	178	170
SALES									
Cull Bulls	2	-	-	4	5	14	18	19	20
Cull Cows	49	-	-	59	78	196	245	245	245
Heifers 2-3 years	-	-	-	-	-	-	243	425	606
Steers/Bulls 2-3 years	-	-	-	-	-	310	488	653	814
Heifers 3-4 years	49	-	-	-	-	-	-	-	-
Steers/Bulls 3-4 years	113	113	113	115	117	200	-	-	-
Steers, purchased	-	-	626	2,235	3,245	3,939	3,244	2,874	2,514
Breeding Bulls, Ranch Bred 2-3 yrs	-	-	-	-	-	18	35	50	75
Total Sales	213	113	739	2,413	3,445	4,677	4,273	4,266	4,274
TECHNICAL COEFFICIENTS									
Calves Weaned %	50	50	50	60	70	75	75	75	75
Mortality %	3	3	3	2	2	2	2	2	2
Culling Rate Bulls %	10	0	0	10	10	20	20	20	20
Culling Rate Cows %	10	0	0	5	5	10	10	10	10
Culling Rate Heifers 3-4 years	45	0	0	0	-	-	-	-	-
Culling Rate Heifers 2-3 years	0	0	0	0	0	0	45	60	67
Bulls as % of Breeding Females	3	3	3	3	3	3	3	3	3
Stocking Rate: acres/AU	60	30	15	11	8.6	8.6	8.6	8.6	8.6

1/ An Animal Unit is equivalent to an animal of one year of age or more.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NELC Ranches

Darazo Ranch - 2,500 ac

Investment Costs

(N)

	Unit	Unit Cost	Project Year 2 Units	2 Cost	3 Units	3 Cost	4 Units	4 Cost	TOTAL Units	TOTAL Cost
CATEGORY										
FIXED INVESTMENT										
Firebreaks and Roads										
Firebreaks and Access Tracks	Mile	70	4	280	4	280	4	280	12	840
Roads	Mile	230	2	460	-	-	-	-	2	460
Sub-Total				740		280		280		1,300
Water Development										
Dams	Unit	4,000	1	4,000	-	-	-	-		4,000
Stock Handling Facilities and Fencing										
Handling Yard and Dip	Unit	2,400	1	2,400	-	-	-	-	1	2,400
Cattle Scale	Unit	2,000	1	2,000	-	-	-	-	1	2,000
Fencing	Unit	700	2	1,400	2	1,400	2	1,400	6	4,200
Sub-Total				5,800		1,400		1,400		8,600
Ranch Buildings										
Storage Shed	Unit	2,000	1	2,000	-	-	-	-	1	2,000
Sub-Total				2,000						2,000
Vehicles and Equipment										
Motorcycle	Unit	450	1	450	-	-	-	-	1	450
Tractor, 60-65 HP	Unit	4,500	1	4,500	-	-	-	-	1	4,500
Trailer	Unit	800	1	800	-	-	-	-	1	800
Disc Harrow	Unit	1,100	1	1,100	-	-	-	-	1	1,100
Disc Plough (3 furrow)	Unit	900	1	900	-	-	-	-	1	900
Rotary Cutter	Unit	800	1	800	-	-	-	-	1	800
Rotary Fertilizer Distributor	Unit	900	1	900	-	-	-	-	1	900
Levelling Harrow	Unit	500	1	500	-	-	-	-	1	500
Seed Drill	Unit	1,200	1	1,200	-	-	-	-	1	1,200
Tools, ect.	Set	400	1	400	-	-	-	-	1	400
Veterinary Equipment	Set	200	1	200	-	-	-	-	1	200
Sub-Total				11,750						11,750
Pasture Improvement										
Land Clearing, Seed Bed Preparation and Sowing	Ac	25	100	2,500	100	2,500	100	2,500	300	7,500
Fertilizer 1/	Ton	180	25	4,500	25	4,500	25	4,500	75	13,500
Seed 2/	Lb	1.20	1,000	1,200	1,000	1,200	1,000	1,200	3,000	3,600
Pesticide 3/	Gal	10	100	1,000	100	1,000	100	1,000	300	3,000
Sub-Total				9,200		9,200		9,200		27,600
TOTAL FIXED INVESTMENT				33,490		10,880		10,880		55,250

1/ Assumes application of triple superphosphate at 2.5 cwt/ac at sowing and 2.5 cwt/ac 6 months later.
2/ Assumes sowing rate of 10 lb of mixture/ac.
3/ Assumes application of one gal/ac of formicide.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NELC Ranches

Bornu Ranch - 60,000 ac

Investment Costs
(N)

CATEGORY	Unit	Unit Cost	Project Year 2 Units	2 Cost	3 Units	3 Cost	4 Units	4 Cost	TOTAL Units	TOTAL Cost
FIXED INVESTMENT										
Firebreaks and Roads										
Firebreaks and Access Tracks	Mile	70	12	840	12	840	12	840	36	2,520
Roads	Mile	230	6	1,380	6	1,380	6	1,380	18	4,140
Sub-Total				2,220		2,220				6,660
Water Development										
Bores	Unit	11,500	2	23,000	1	11,500	-	-	3	34,500
Waterpipes	Mile	1,150	2	2,300	1	1,150	-	-	3	3,450
Watertroughs	Unit	60	6	360	3	180	-	-	9	540
Sub-Total				25,660		12,830		-		38,490
Stock Handling Facilities and Fencing										
Handling Yard and Dip	Unit	4,600	1	4,600	-	-	-	-	1	4,600
Fencing	Mile	700	12	8,400	12	8,400	12	8,400	36	25,200
Sub-Total				13,000		8,400		8,400	29,800	29,800
Housing and Ranch Buildings										
House: Assistant Manager	Unit	15,000	1	15,000	-	-	-	-	1	15,000
Chief Clerk	Unit	5,000	1	5,000	-	-	-	-	1	5,000
Plant Operator	Unit	3,000	1	3,000	-	-	-	-	1	3,000
Field Assistant	Unit	1,000	2	2,000	2	2,000	-	-	4	4,000
Driver	Unit	1,000	1	1,000	1	1,000	-	-	2	2,000
Herdsman/Laborer/Guard	Unit	500	10	5,000	10	5,000	10	5,000	30	15,000
Storage Shed	Unit	4,500	1	4,500	-	-	-	-	1	4,500
Sub-Total				35,500		8,000		5,000		48,500
Vehicles and Equipment										
Four Wheel Drive Vehicle	Unit	4,500	1	4,500	-	-	-	-	1	4,500
Tractor, 60-65 hp	Unit	4,500	1	4,500	1	4,500	-	-	2	9,000
Truck	Unit	8,000	1	8,000	-	-	-	-	1	8,000
Trailer	Unit	800	1	800	1	800	-	-	2	1,600
Disc Harrow	Unit	1,100	1	1,000	-	-	-	-	1	1,100
Disc Plough (3 furrow)	Unit	900	1	900	-	-	-	-	1	900
Rotary Cutter	Unit	800	1	800	1	800	-	-	2	1,600
Rotary Fertilizer Distributor	Unit	900	1	900	1	900	-	-	2	1,800
Levelling Harrow	Unit	500	1	500	-	-	-	-	1	500
Seed Drill	Unit	1,800	1	1,800	-	-	-	-	1	1,800
Tools, etc.	Set	700	1	700	-	-	-	-	1	700
Veterinary Equipment	Set	300	1	300	1	300	-	-	2	600
Spares 1/				2,000		700				2,700
Sub-Total				26,800		8,000		-		34,800
Pasture Improvement										
Land Clearing, Seed Bed Preparation and Sowing.	Ac	35	500	17,500	500	17,500	500	17,500	1,500	52,500
Fertilizer 2/	Ton	180	125	22,500	125	22,500	125	22,500	375	67,500
Seed 3/	Lb	1.20	5,000	6,000	5,000	6,000	5,000	6,000	15,000	18,000
Pesticide 4/	Gal	10	500	5,000	500	5,000	500	5,000	1,500	15,000
Sub-Total				51,000		51,000		51,000		153,000
Physical Contingencies 10%				15,400		9,050		6,700		31,150
TOTAL FIXED INVESTMENT				169,580		99,500		73,320		342,400

1/ 10% of cost of vehicles and equipment excepting four wheel drive vehicle.
2/ Assumes application of triple superphosphate at 2.5 cwt/ac at sowing and 2.5 cwt/ac 6 months later.
3/ Assumes sowing rate of 10 lb of mixture/ac.
4/ Assumes application of one gal/ac of formicide.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NELC Ranches

Darazo Ranch - 2,500 ac

Sales, Operating Expenses and Livestock Purchases

(N)

	Before Development	Project Years 2	3	4	5	6	7	8-21
CATEGORY								
SALES								
Cull Bulls 1/	-	-	-	200	200	400	600	600
Cull Cows 2/	800	-	-	-	3,200	3,200	6,400	6,400
Heifers (2-3 years) 3/	-	-	-	-	2,000	15,400	15,600	19,200
Heifers (3-4 years) 4/	450	-	-	-	-	-	-	-
Steers/Bulls (2-3 years) 5/	-	-	-	-	-	5,700	9,450	10,800
Steers/Bulls (3-4 years) 6/	1,900	1,900	1,900	1,900	2,090	11,590	5,510	-
Breeding Bulls (2-3 Years) 7/	-	-	-	-	-	7,400	12,600	14,400
TOTAL LIVESTOCK SALES	3,150	1,900	1,900	2,100	7,490	43,690	50,160	51,400
OPERATING EXPENSES								
Salaries and Wages								
Manager		3,600	3,600	3,600	3,600	3,600	3,600	3,600
Chief Clerk		1,200	1,200	1,200	1,200	1,200	1,200	1,200
Field Assistant) 8/		600	600	600	600	600	600	600
Driver)		600	1,200	1,200	1,200	1,200	1,200	1,200
Herdsman Laborer) 9/		2,000	2,800	4,000	4,000	4,000	4,000	4,000
Guard)		400	800	800	800	800	800	800
Sub-Total		8,400	10,200	11,400	11,400	11,400	11,400	11,400
Maintenance 10/								
Fencing		300	370	440	510	510	510	510
Firebreaks, Access Tracks and Roads		-	40	50	70	70	70	70
Stock Handling Facilities		-	220	220	220	220	220	220
Water Supply		200	400	400	400	400	400	400
Buildings		700	800	800	800	800	800	800
Sub-Total		1,200	1,830	1,910	2,000	2,000	2,000	2,000
Running Costs of Vehicles								
Tractor 11/		1,500	1,500	1,500	1,500	1,500	1,500	1,500
Motorcycle 12/		160	160	160	160	160	160	160
Sub-Total		1,660	1,660	1,660	1,660	1,660	1,660	1,660
Replacement of Vehicles and Equipment 13/		1,765	1,765	1,765	1,765	1,765	1,765	1,765
Animal Health								
Vaccines and Drugs 14/		470	629	785	1,032	1,050	1,059	1,059
Insecticides 15/		313	419	523	688	700	706	706
Sub-Total		783	1,048	1,308	1,720	1,750	1,765	1,765
Pasture Maintenance								
Sown Pasture 16/		-	2,250	4,500	6,750	6,750	6,750	6,750
Natural Pasture 17/		2,700	2,700	2,700	2,700	2,700	2,700	2,700
Sub-Total		2,700	4,950	7,200	9,450	9,450	9,450	9,450
Miscellaneous 18/		825	1,075	1,260	1,400	1,400	1,400	1,400
TOTAL OPERATING EXPENSES	17,000	17,333	22,528	26,503	29,395	29,425	29,440	29,440
LIVESTOCK PURCHASES 19/								
Bulls 20/	160	1,500	750	500	750	750	1,000	1,000
In-Calf Cows/Heifers 21/	-	40,000	20,000	-	-	-	-	-
TOTAL LIVESTOCK PURCHASES	160	41,500	20,750	500	750	750	1,000	1,000
TOTAL OPERATING EXPENSES AND LIVESTOCK PURCHASES	17,160	58,833	43,278	27,003	30,145	30,175	30,440	30,440

1/ N200 per head.
2/ N160 per head.
3/ N200 per head.
4/ N150 per head.
5/ N150 per head.
6/ N190 per head.
7/ N200 per head.
8/ N600 per year.
9/ N400 per year.
10/ 5% of construction cost beginning with year following construction. Assumes values of old structures as follows: fencing N6,000; water supply, N4,000; buildings N14,000.
11/ 1,000 working hours per year at N1.50 per hour for fuel, oil, grease, spare parts and repairs.
12/ 8,000 miles per year at N0.02 per mile for fuel, oil, grease, spare parts, repairs and insurance.
13/ 15% of cost beginning with year of acquisition.
14/ N1.5 per AU per year.
15/ N1.0 per AU per year.
16/ 2.5 cwt of triple superphosphate per ac per year at N180 per ton.
17/ 1 cwt of triple superphosphate per ac per year at N180 per ton on 300 ac.
18/ 5% of operating expenses.
19/ Livestock purchases during FY's 2 and 3 are treated as development costs for financing purposes.
20/ N250 per head.
21/ N200 per head.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NDLC Ranches

Borgu Ranch - 60,000 ac

Sales, Operating Expenses and Livestock Purchases
(N)

CATEGORY	Before Development	Project Years 2	3	4	5	6	7	8	9-21
SALES									
Cull Bulls 1/	400	-	-	800	1,000	2,800	3,600	3,800	4,000
Cull Cows 2/	7,800	-	-	9,440	12,480	31,360	39,200	39,200	39,200
Heifers (2-3 years) 3/		-	-	-	-	-	48,600	85,000	121,200
Heifers (3-4 years) 4/	7,350	-	-	-	-	-	-	-	-
Steers/Bulls (2-3 years) 5/		-	-	-	-	46,500	73,200	97,950	122,100
Steers/Bulls (3-4 years) 6/	21,470	21,470	21,470	21,850	22,230	38,000	-	-	-
Breeding Bulls (2-3 years) 7/			-	-	-	3,600	7,000	10,000	15,000
Purchased Steers 8/	———	———	100,160	357,600	519,200	630,240	519,040	459,840	402,240
TOTAL LIVESTOCK SALES	37,020	21,470	121,630	389,690	554,910	752,500	690,640	695,790	703,740
OPERATING EXPENSES									
Salaries and Wages									
Manager		5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Assistant Manager		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Chief Clerk		1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Plant Operator/Mechanic		1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Field Assistant) 9/		1,800	2,400	3,000	3,000	3,000	3,000	3,000	3,000
Driver)		1,200	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Herdsman/Laborer) 10/		6,000	10,000	16,000	16,000	16,000	16,000	16,000	16,000
Guard)		1,200	1,600	2,000	2,000	2,000	2,000	2,000	2,000
Sub-Total		21,500	27,700	34,700	34,700	34,700	34,700	34,700	34,700
Maintenance 11/									
Fencing		1,500	1,920	2,340	2,760	2,760	2,760	2,760	2,760
Firebreaks, Access Tracks and Roads		-	110	220	335	335	335	335	335
Stock Handling Facilities and Dip		250	480	480	480	480	480	480	480
Water Supply		1,800	3,085	3,725	3,725	3,725	3,725	3,725	3,725
Buildings		3,000	4,775	5,175	5,425	5,425	5,425	5,425	5,425
Sub-Total		6,550	10,370	11,940	12,725	12,725	12,725	12,725	12,725
Tractor, Vehicle and Equipment Expenses									
Tractor 12/		2,250	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Four Wheel Drive Vehicle 13/		1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Truck 14/		1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Power Plant		1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150
Sub-Total		6,200	8,450	8,450	8,450	8,450	8,450	8,450	8,450
Replacement of Vehicles and Equipment 15/		4,960	6,420	6,420	6,420	6,420	6,420	6,420	6,420
Animal Health									
Vaccines and Drugs 16/		3,000	6,000	8,250	10,500	10,500	10,500	10,500	10,500
Insecticides 17/		2,000	4,000	5,500	7,000	7,000	7,000	7,000	7,000
Sub-Total		5,000	10,000	13,750	17,500	17,500	17,500	17,500	17,500
Pasture Maintenance									
Sown Pasture 18/		-	22,500	22,500	33,750	33,750	33,750	33,750	33,750
Natural Pasture 19/		27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000
Sub-Total		27,000	38,250	49,500	60,750	60,750	60,750	60,750	60,750
Miscellaneous 20/		3,560	5,060	6,240	7,025	7,025	7,025	7,025	7,025
TOTAL OPERATING EXPENSES	72,140	74,770	106,250	131,000	147,570	147,570	147,570	147,570	147,570
LIVESTOCK PURCHASES 21/									
Bulls 22/	480	2,000	3,750	4,000	5,750	4,500	2,500	2,500	2,500
In-Calf Cows/Heifers 23/		50,200	52,600	49,800	61,200	78,000	-	-	-
Steers 24/	———	70,950	250,910	361,210	442,090	364,100	322,630	281,490	281,490
TOTAL LIVESTOCK PURCHASES	480	123,150	307,260	418,010	509,040	446,600	325,130	283,990	283,990
TOTAL OPERATING EXPENSES AND LIVESTOCK PURCHASES	72,620	197,920	413,510	549,010	656,610	594,170	472,700	431,560	431,560

1/ N200 per head.
2/ N160 per head.
3/ N200 per head.
4/ N150 per head.
5/ N150 per head.
6/ N190 per head.
7/ N200 per head.
8/ N160 per head.
9/ N600 per year.
10/ N400 per year.
11/ 5% of construction cost beginning with year following construction. Assumes values of old structures as follows: fencing, N30,000; stock handling facilities, N5000; water supply, N36,000; buildings, N60,000.
12/ 1,500 working hours at N1.50 per hour for fuel, oil, grease, spare parts and repairs.
13/ 10,000 miles per year at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
14/ 10,000 miles per year at N 0.15 per mile for fuel, oil, grease, spare parts, repairs and insurance.
15/ 20% of cost beginning with year of acquisition (includes already existing power plant valued at N5,000.
16/ N1.5 per AU per year.
17/ N1.0 per AU per year.
18/ 2.5 cwt of triple superphosphate per ac per year at N180 per ton.
19/ 1 cwt of triple superphosphate per ac per year at N180 per ton on 3000 ac.
20/ 5% of operating expenses.
21/ Treated as development costs in FY 2-5 (see Table 9).
22/ N250 per head.
23/ N200 per head.
24/ N110 per head.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NELC Ranches

General Administration - Investment and Operating Expenses

(N)

CATEGORY	Unit Cost	Project Year 2	Project Year 3-21
FIXED INVESTMENT			
Vehicles			
Four Wheel Drive Vehicle	4,500	4,500	-
Office Furnishings			
Office Furniture	900	900	-
Office Equipment	900	900	-
Sub-Total		1,800	-
Physical Contingencies 10%		630	-
TOTAL FIXED INVESTMENT		6,930	-
OPERATING EXPENSES			
Salaries			
General Manager	7,000	7,000	7,000
Secretary/Accountant	3,000	3,000	3,000
Chief Clerk/Typist	1,600	1,600	1,600
Driver	600	600	600
Messenger	400	400	400
Sub-Total		12,600	12,600
Transport			
Vehicle Running Expenses 1/		1,560	1,560
Vehicle Replacement 2/		900	900
Sub-Total		2,460	2,460
Office			
Rental		900	900
Stationery		350	350
Postage		350	350
Telephone		250	250
Sub-Total		1,850	1,850
Audit and Professional Fees and Insurances		3,600	3,600
Miscellaneous		990	990
TOTAL OPERATING EXPENSES		21,500	21,500

1/ 12,000 miles per year at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
2/ 20% of cost beginning with year of acquisition.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT
NELC Ranches
Cash Flow
(N)

	Before Development	Project Year 2	3	4	5	6	7	8	9-14	15 and After
Cash Inflow										
Livestock Sales - Darazo	2,440	1,900	1,900	2,100	7,490	43,690	50,160	51,400	51,400	51,400
- Bornu	28,840	21,470	121,630	389,690	554,910	752,500	690,640	695,790	703,740	703,740
Sub-Total	31,280	23,370	123,530	391,790	562,400	796,190	740,800	747,190	755,140	755,140
Development Loan 1/	-	262,250	306,873	351,897	356,853	-	-	-	-	-
State Government Equity Contribution 2/	-	250,000	250,000	100,000	-	-	-	-	-	-
Total Cash Inflow	31,280	535,625	680,403	843,687	919,253	796,190	740,800	747,190	755,140	755,140
Cash Outflow										
Fixed Investment-General Administration	-	6,930	-	-	-	-	-	-	-	-
-Darazo	-	33,490	10,880	10,880	-	-	-	-	-	-
-Bornu	-	169,580	99,500	73,320	-	-	-	-	-	-
Livestock Purchases - Darazo	160	41,500	20,750	500	750	750	1,000	1,000	1,000	1,000
- Bornu	480	123,150	307,260	418,010	509,040	446,600	325,130	283,990	283,990	283,990
Sub-Total Fixed Investment and Herd Build-up	-	374,650	438,390	502,710	509,790	447,350	326,130	284,990	284,990	284,990
Operating Expenses - General Administration	-	21,500	21,500	21,500	21,500	21,500	21,500	21,500	21,500	21,500
- Darazo	17,326	17,333	22,528	26,503	29,395	29,425	29,440	29,440	29,440	29,440
- Bornu	72,140	74,770	106,250	131,000	147,570	147,570	147,570	147,570	147,570	147,570
Sub-total Cash Outflow Before Loan Sevice	90,106	488,253	588,668	681,713	708,255	645,845	524,640	483,500	483,500	483,500
Development Loan Service	-	12,457	39,490	70,781	104,447	217,501	217,501	217,501	217,501	-
Total Cash Outflow	90,106	500,710	628,158	752,494	812,702	863,346	742,141	701,001	701,001	483,500
Cash Balance - Annual	(58,826)	34,915	52,245	91,193	106,551	(67,156)	(1,341)	46,189	54,139	271,640
- Cumulative	-	-	87,160	178,353	284,904	217,748	216,407	262,596	316,735	588,375

1/ Development loan disbursed against 70% of total fixed investment and herd build-up. The loan is at 9¼% for 13 years including 4 years grace.
2/ The amount of the contribution is calculated to provide adequate cash to cover against lags in disbursements and possible tax assessments. The latter cannot be estimated until the arrangements for taking over the ranches are known in detail.

The financial rate of return is 13.5 over 20 years based on:
(a) total cash inflow from sales;
(b) total cash outflow before loan service;
(c) incremental herd value of N 1,211,280; and
(d) taking no account of losses and sunk costs before development.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

WLC Ranches

On-going Ranches (Upper Ogun, Akuma) - 24,000 ac Each

Herd Projection (Each Ranch)

HERD COMPOSITION	Before Development	Project Year 2	3	4	5	6	7	8	9	10	11	12	13-21
Bulls	70	68	80	90	102	99	115	132	137	156	157	157	157
Breeding Cows	1,200	1,988	2,236	2,490	2,795	3,110	3,555	4,092	4,673	5,338	5,936	5,936	5,936
Weaners	656	860	994	1,342	1,743	2,096	2,333	2,666	3,069	3,505	4,004	4,452	4,452
Heifers 9-24 months	325	318	417	487	658	854	1,027	1,143	1,307	1,312	715	715	715
In-calf Heifers	520	-	-	-	-	-	-	-	-	-	-	-	-
Steers/Bulls 9-24 months	310	318	417	487	658	854	1,027	1,143	841	150	150	150	150
Steers, Purchased	-	-	850	1,946	2,787	2,063	1,254	465	-	-	-	-	-
Breeding Bulls, Ranch Bred, 2-3 years	-	-	-	-	-	20	22	25	42	44	43	43	43
Total Animals	3,081	3,552	4,994	6,842	8,743	9,096	9,333	9,666	10,069	10,505	11,005	11,453	11,453
Total Animal Units, AU 1/	2,425	2,692	4,000	5,500	7,000	7,000	7,000	7,000	7,000	7,000	7,001	7,001	7,001
PURCHASES													
Bulls	9	-	14	20	23	19	21	25	14	16	-	-	-
Steers	-	-	850	1,946	2,787	2,063	1,254	465	-	-	-	-	-
In-calf Cows/Heifers	520	-	-	-	-	-	-	-	-	-	-	-	-
Total Purchases	529	-	864	1,966	2,810	2,082	1,275	490	14	16	-	-	-
MORTALITY													
Bulls	2	2	2	2	2	2	2	3	3	4	4	4	4
Breeding Cows	36	47	60	45	50	56	62	71	82	94	107	119	119
Weaners	20	20	26	20	26	35	42	47	52	61	69	80	88
Heifers 9-24 months	10	10	10	8	10	13	17	21	23	26	26	14	14
Steers/Bulls 9-24 months	10	9	10	8	10	13	17	21	23	17	3	3	3
Steers, Purchased	-	-	-	17	39	56	41	25	9	-	-	-	-
Total Mortality	78	88	108	100	137	175	181	188	192	202	209	220	228
SALES													
Cull Bulls	7	-	-	8	9	20	23	27	31	35	39	39	39
Cull Cows	116	-	-	110	122	274	305	348	401	458	523	582	582
Heifers 9-24 months	-	-	-	-	-	-	-	-	-	192	1,003	1,247	1,467
Steers 9-24 months	-	-	-	-	-	-	-	-	466	1,354	1,568	1,812	2,032
Heifers 2-3 years	148	-	-	-	-	-	25	50	56	64	58	-	-
Steers/Bulls 2-3 years	301	301	308	409	477	575	750	901	978	680	-	-	-
Steers, Purchased	-	-	-	833	1,907	2,731	2,022	1,229	456	-	-	-	-
Breeding Bulls, Ranch Bred, 2-3 yrs	-	-	-	-	-	50	65	80	100	100	104	104	104
Total Sales	572	301	308	1,360	2,515	3,650	3,190	2,635	2,488	2,883	3,295	3,784	4,224
TECHNICAL COEFFICIENTS													
Calves Weaned %	55	50	50	60	70	75	75	75	75	75	75	75	75
Mortality %	3	3	3	2	2	2	2	2	2	2	2	2	2
Culling Rate Bulls %	10	0	0	10	10	20	20	20	20	20	20	20	20
Culling Rate Cows %	10	0	0	5	5	10	10	10	10	10	10	10	10
Culling Rate Heifers 9-24 months %	0	0	0	0	0	0	0	0	0	13	58	64	67
Culling Rate Heifers 2-3 years %	0	0	0	0	0	0	3	5	5	5	4.5	-	-
Bulls as % of Breeding Females	3	3	3	3	3	3	3	3	3	3	3	3	3
Stocking Rate: acres/AU	10	8.9	6	4.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4

1/ An Animal Unit is equivalent to an animal of one year of age or more.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

WLC Ranches

Start up Ranches (Ogboro, Oke-Ako, Ibarapa) - 24,000 ac Each

Herd Projection (Each Ranch)

	Before Development 1/	Project Year 2	3	4	5	6	7	8	9	10	11-21
HERD COMPOSITION											
Bulls	31	30	52	73	96	128	120	140	151	153	153
Breeding Cows	1,031	1,000	1,470	2,186	2,775	3,506	3,827	4,375	5,096	5,096	5,096
Weaners	-	515	500	882	1,530	2,081	2,630	2,870	3,281	3,822	3,822
Heifers 9-24 months	-		250	245	432	750	1,020	1,289	613	613	613
Steers/Bulls 9-24 months	-		250	245	432	750	1,020	166	120	120	120
Steers, Purchased	1,000	970	1,478	2,251	2,265	866	-	-	-	-	-
Breeding Bulls, Ranch Bred, 2-3 yrs.	-	-	-	-	-	-	25	30	20	18	18
Total Animal	2,062	2,515	4,000	5,882	7,530	8,081	8,642	8,870	9,281	9,822	9,822
Total Animal Units 2/	2,062	2,000	3,500	5,000	6,000	6,000	6,012	6,000	6,000	6,000	6,000
PURCHASES											
Bulls	31	-	23	22	32	43	20	26	17	18	18
In-calf Cows/Heifers	1,031	-	500	500	500	500	-	-	-	-	-
Steers	1,000	970	1,478	2,251	2,265	866	-	-	-	-	-
Total Purchases	2,062	970	2,001	2,773	2,797	1,409	20	26	17	18	18
MORTALITY											
Bulls	-	1	1	1	2	2	3	3	3	3	3
Breeding Cows	-	31	30	29	44	56	70	77	88	102	102
Weaners	-		15	10	18	30	41	52	58	65	76
Heifers 9-24 months	-		-	5	5	9	15	20	26	12	12
Steers/Bulls 9-24 months	-		-	5	5	9	15	20	3	2	2
Heifers 2-3 years	-		-	-	-	-	-	-	-	-	-
Steers/Bulls 2-3 years	-		-	-	-	-	-	-	-	-	-
Steers, Purchased	-	30	29	30	45	45	17	-	-	-	-
Total Mortality	-	62	75	80	119	151	161	172	178	184	195
SALES											
Cull Bulls	-	-	-	-	7	9	25	28	33	33	33
Cull Cows	-	-	-	-	107	136	344	375	454	499	499
Heifers 9-24 months	-	-	-	-	-	-	-	-	793	995	1,260
Steers/Bulls 9-24 months	-	-	-	-	-	-	-	1,123	1,286	1,488	1,753
Steers/Bulls 2-3 years	-	-	-	245	240	423	660	900	45	-	-
Steers, Purchased	-	970	941	1,448	2,206	2,220	849	-	-	-	-
Breeding Bulls, Ranch Bred, 2-3 yrs	-	-	-	-	-	-	50	70	98	100	100
Total Sales	-	970	941	1,693	2,560	2,788	1,928	2,496	2,709	3,115	3,645
TECHNICAL COEFFICIENTS											
Calves Weaned %	-	50	50	60	70	75	75	75	75	75	75
Mortality %	-	3	3	2	2	2	2	2	2	2.	2
Culling Rate Bulls %	-	0	0	0	10	10	20	20	20	20	20
Culling Rate Cows %	-	0	0	0	5	5	10	10	10	10	10
Culling Rate Heifers 9-24 months %	-	0	0	0	0	0	0	0	56	62	67
Bulls as % of Breeding Females	-	3	3	3	3	3	3	3	3	3	3
Stocking Rate: acres/AU	-	12	6.6	4.8	4	4	4	4	4	4	4

1/ Represents animals purchased at beginning of Year 1.

2/ An Animal Unit is equivalent to an animal of one year of age or more.

December 14, 1973

ANNEX 7
Table 3

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

WLC Ranches

On-Going Ranches (Upper Ogun, Akuna) - 24,000 ac Each

Investment Costs (Each Ranch)

(N)

CATEGORY	Unit	Unit Cost	Project Year 2 Units	Project Year 2 Cost	Project Year 3 Units	Project Year 3 Cost	Project Year 4 Units	Project Year 4 Cost	TOTAL Units	TOTAL Cost
FIXED INVESTMENT										
Firebreaks and Roads										
Firebreaks and Access Tracks	Mile	70	10	700	10	700	10	700	30	2,100
Roads	Mile	230	5	1,150	5	1,150	5	1,150	15	3,450
Sub-Total				1,850		1,850		1,850		5,550
Water Development										
Dams	Unit	6,900	2	13,800	1	6,900	-	-	3	20,700
Fencing	Mile	700	10	7,000	10	7,000	10	7,000	30	21,000
Housing and Ranch Buildings										
House: Herdsman/Laborer/Guard	Unit	500	10	5,000	-	-	-	-	10	5,000
Storage Shed	Unit	4,500	1	4,500	-	-	-	-	1	4,500
Sub-Total				9,500						9,500
Vehicles and Equipment										
Four Wheel Drive Vehicle	Unit	4,500	1	4,500	-	-	-	-	1	4,500
Tractor, 60-65 HP	Unit	4,500	1	4,500	1	4,500	-	-	2	9,000
Truck, 5-Ton	Unit	8,000	1	8,000	-	-	-	-	1	8,000
Trailer	Unit	800	1	800	1	800	-	-	2	1,600
Disc Harrow	Unit	1,100	1	1,100	-	-	-	-	1	1,100
Disc Plough (3 furrow)	Unit	900	1	900	-	-	-	-	1	900
Rotary Cutter	Unit	800	1	800	1	800	-	-	2	1,600
Rotary Fertilizer Distributor	Unit	900	1	900	1	900	-	-	2	1,800
Levelling Harrow	Unit	500	1	500	-	-	-	-	1	500
Seed Drill	Unit	1,800	1	1,800	-	-	-	-	1	1,800
Tools, etc.	Set	700	1	700	-	-	-	-	1	700
Veterinary Equipment	Set	300	1	300	-	-	-	-	1	300
Power Plant 1/	Unit	8,000	1/2	4,000	-	-	-	-	1/2	4,000
Spares 2/				2,430		700		-		3,130
Sub-Total				31,230		7,700				38,930
Pasture Improvement										
Land Clearing, Seed Bed Preparation and Sowing	Ac	25	500	12,500	500	12,500	500	12,500	1,500	37,500
Fertilizer 3/	Ton	180	125	22,500	125	22,500	125	22,500	375	67,500
Seed 4/	Lb	1.20	5,000	6,000	5,000	6,000	5,000	6,000	15,000	18,000
Pesticides 5/	Gal	10	500	5,000	500	5,000	500	5,000	1,500	15,000
Sub-Total				46,000		46,000		46,000		138,000
Physical Contingencies 10%				10,940		6,950		5,490		23,380
TOTAL FIXED INVESTMENT				120,320		76,400		60,340		257,060

1/ A power plant is required only at the Akuna ranch.
2/ 10% of cost of vehicles and equipment excepting four wheel drive vehicle.
3/ Assumes application of triple superphosphate at 2.5 cwt per ac at sowing and 2.5 cwt per ac 6 months later.
4/ Assumes sowing rate of 10 lb of mixture/ac.
5/ Assumes application of one gal/ac of formicide.

December 14, 1973

ANNEX 7
Table 4

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

WLC Ranches

Start-Up Ranches (Ogboro, Oke-Ako, Ibarapa) - 24,000 ac Each

Investment Costs (Each Ranch)

(N)

CATEGORY	Unit	Unit Cost	Project Year 2 Units	2 Cost	3 Units	3 Cost	4 Units	4 Cost	TOTAL Units	TOTAL Cost
FIXED INVESTMENT										
Firebreaks and Roads										
Firebreaks and Access Tracks	Mile	70	10	700	10	700	10	700	30	2,100
Roads	Mile	230	5	1,150	5	1,150	5	1,150	15	3,450
Sub-Total				1,850		1,850		1,850		5,550
Water Development										
Dams	Unit	7,000	2	14,000	1	7,000	1	7,000	4	28,000
Stock Handling Facilities and Fencing										
Handling Yard and Dip 1/	Unit	4,600	1	4,600	1	4,600	-		2	9,200
Cattle Scale	Unit	2,300	1	2,300	-	-	-		1	2,300
Fencing	Mile	700	10	7,000	10	7,000	10	7,000	30	21,000
Sub-Total				13,900		11,600		7,000		32,500
Housing and Ranch Buildings										
House: Manager	Unit	20,000	1	20,000	-		-		1	20,000
Assistant Manager	Unit	15,000	1	15,000	-		-		1	15,000
Chief Clerk	Unit	5,000	1	5,000	-		-		1	5,000
Plant Operator	Unit	3,000	1	3,000	-		-		1	3,000
Field Assistant/Driver	Unit	1,000	7	7,000	2	2,000	-		9	9,000
Herdsman/Laborer/Guard	Unit	500	18	9,000	12	6,000	10	5,000	40	20,000
Vehicle Shed/Workshop	Unit	7,000	1	7,000	-		-		1	7,000
Office/Storeroom	Unit	2,500	1	2,500	-		-		1	2,500
Sub-Total				68,500		8,000		5,000		81,500
Vehicles and Equipment										
Four Wheel Drive Vehicle	Unit	4,500	1	4,500	-		-		1	4,500
Tractor, 60-65 HP	Unit	4,500	1	4,500	1	4,500	-		2	9,000
Truck, 5-Ton	Unit	8,000	1	8,000	-		-		1	8,000
Trailer	Unit	800	1	800	1	800	-		2	1,600
Disc Harrow	Unit	1,100	1	1,100	-		-		1	1,100
Disc Plough (3 furrow)	Unit	900	2	1,800	-		-		2	1,800
Rotary Cutter	Unit	800	1	800	1	800	-		2	1,600
Rotary Fertilizer Distributor	Unit	900	1	900	1	900	-		2	1,800
Levelling Harrow	Unit	500	1	500	-		-		1	500
Seed Drill	Unit	1,800	1	1,800	-		-		1	1,800
Tools, etc.	Set	700	1	700	-		-		1	700
Veterinary Equipment	Set	300	1	300	-		-		1	300
Power Plant	Unit	8,000	-		1	8,000	-		1	8,000
Spares 2/				2,600		1,500	-			4,100
Sub-Total				28,300		16,500				44,800
Pasture Improvement										
Land Clearing, Seed Bed Preparation and Sowing	Ac	60	500	30,000	500	30,000	500	30,000	1,500	90,000
Fertilizer 3/	Ton	180	125	22,500	125	22,500	125	22,500	375	67,500
Seed 4/	Lb	120	5,000	6,000	5,000	6,000	5,000	6,000	15,000	18,000
Pesticide 5/	Gal	10	500	5,000	500	5,000	500	5,000	1,500	15,000
Sub-Total				63,500		63,500		63,500		190,500
Physical Contingencies 10%				19,000		10,850		8,450		38,300
TOTAL FIXED INVESTMENT				209,050		119,300		92,800		421,150

1/ Capacity of 1,000 head.
2/ 10% of cost of vehicles and equipment excepting four wheel drive vehicle.
3/ Assumes application of triple superphosphate at 2.5 cwt per ac at sowing and 2.5 cwt per ac 6 months later.
4/ Assumes sowing rate of 10 lb of mixture/ac.
5/ Assumes application of one gal/ac of formicide.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

WLC Ranches

On-Going Ranches (Upper Ogun, Akuna) - 24,000 ac Each

Sales, Operating Expenses and Livestock Purchases (Each Ranch)
(N)

CATEGORY	Before Development	Project Years 2	3	4	5	6	7	8	9	10	11	12	13-21
SALES													
Cull Bulls 1/		-	-	1,360	1,530	3,400	3,910	4,590	5,270	5,950	6,630	6,630	6,630
Cull Cows 2/		-	-	14,300	15,860	35,620	39,650	45,240	52,130	59,540	67,990	75,660	75,660
Heifers (9-24 months) 3/		-	-	-	-	-	-	-	-	23,040	120,360	149,640	176,040
Heifers (2-3 years) 4/		-	-	-	-	-	5,000	10,000	11,200	12,800	11,600	-	-
Steers/Bulls (9-24 months) 5/		-	-	-	-	-	-	-	37,280	108,320	125,440	144,960	162,560
Steers/Bulls (2-3 years) 6/		36,120	36,960	49,080	57,240	69,000	90,000	108,120	117,360	81,600	-	-	-
Breeding Bulls (2-3 Years) 7/		-	-	-	-	9,000	11,700	14,400	18,000	18,000	18,720	18,720	18,720
Purchased Steers 8/		-	-	116,620	266,980	382,340	283,080	172,060	63,840	-	-	-	-
TOTAL LIVESTOCK SALES	54,174	36,120	36,960	181,360	341,610	499,360	433,340	354,410	305,080	309,250	350,740	395,610	432,610
OPERATING EXPENSES													
Salaries and Wages													
Manager		5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Assistant Manager		3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Chief Clerk		1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Plant Operator/Mechanic		1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Field Assistant) 9/		1,800	2,400	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Driver)		1,200	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Herdsman/Laborer) 10/		6,800	10,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
Guard)		1,200	1,600	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Sub-Total		22,300	27,700	34,700	34,700	34,700	34,700	34,700	34,700	34,700	34,700	34,700	34,700
Maintenance 11/													
Fencing		775	1,120	1,465	1,810	1,810	1,810	1,810	1,810	1,810	1,810	1,810	1,810
Firebreaks, Access Tracs and Roads		-	95	185	280	280	280	280	280	280	280	280	280
Stock Handling Facilities and Dip		250	250	250	250	250	250	250	250	250	250	250	250
Water Supply		450	1,110	1,485	1,485	1,485	1,485	1,485	1,485	1,485	1,485	1,485	1,485
Buildings		1,800	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280	2,280
Sub-Total		3,275	4,885	5,665	6,105	6,105	6,105	6,105	6,105	6,105	6,105	6,105	6,105
Vehicle and Equipment													
Tractors 12/		2,250	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Four Wheel Drive Vehicle 13/		1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Truck 14/		1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Power Plant		1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150
Sub-Total		6,200	8,450	8,450	8,450	8,450	8,450	8,450	8,450	8,450	8,450	8,450	8,450
Replacement of Vehicle and Equipment 15/		5,370	6,770	6,770	6,770	6,770	6,770	6,770	6,770	6,770	6,770	6,770	6,770
Animal Health													
Vaccines and Drugs 16/		4,040	6,000	8,250	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500
Insecticides 17/		2,692	4,000	5,500	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000	7,000
Sub-Total		6,732	10,000	13,750	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500	17,500
Pasture Maintenance													
Sown Pastures 18/		-	11,250	22,500	33,750	33,750	33,750	33,750	33,750	33,750	33,750	33,750	33,750
Natural Pasture 19/		18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Sub-Total		18,000	29,250	40,500	51,750	51,750	51,750	51,750	51,750	51,750	51,750	51,750	51,750
Miscellaneous 20/		3,095	4,350	5,490	6,265	6,265	6,265	6,265	6,265	6,265	6,265	6,265	6,265
TOTAL OPERATING EXPENSES	8,554	64,972	91,405	115,325	131,540	131,540	131,540	131,540	131,540	131,540	131,540	131,540	131,540
LIVESTOCK PURCHASES 21/													
Bulls 22/		-	4,900	7,000	8,050	6,650	7,350	8,750	4,900	5,600	-	-	-
Steers 23/		-	85,000	194,600	278,700	206,300	125,400	46,500	-	-	-	-	-
TOTAL LIVESTOCK PURCHASES	38,020	-	89,900	201,600	286,750	212,950	132,750	55,250	4,900	5,600	-	-	-
TOTAL OPERATING EXPENSES AND LIVESTOCK PURCHASES	46,574	64,972	181,305	316,925	418,290	344,490	264,290	186,790	136,440	137,140	131,540	131,540	131,540

1/ N170 per head.
2/ N130 per head.
3/ N120 per head.
4/ N200 per head.
5/ N80 per head.
6/ N120 per head.
7/ N180 per head.
8/ N140 per head.
9/ N600 per head.
10/ N400 per head.
11/ 5% of construction cost beginning with year following construction. Assumes values of old structures as follows: fencing, N15,500; stock handling facilities, N5,000; water supply, N9,000; buildings, N36,000.
12/ 1,500 working hours per year at N1.50 per hour for fuel, oil, grease, spare parts and repairs.
13/ 10,000 miles per year at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
14/ 10,000 miles per year at N 0.15 per mile for fuel, oil, grease, spare parts, repairs and insurance.
15/ 20% of cost of tractors, vehicles and equipment and 10% of cost of power plant beginning with year of acquisition. Existing power plant as Upper Ogun was assumed to have same replacement value of N8,000.
16/ N1.50 per AU per year.
17/ N1.00 per AU per year.
18/ 2.5 cwt of triple superphosphate per ac per year at N180 per ton.
19/ 1 cwt of triple superphosphate per ac per year at N180 per ton on 2,000 ac.
20/ 5% of operating costs.
21/ Treated as development costs in years 3 and 4 (see Table 17).
22/ N350 per head.
23/ N100 per head.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

WLC Ranches

Start-Up Ranches (Ogboro, Oke-Ako, Ibarapo) - 24,000 ac Each

Sales, Operating Expenses and Livestock Purchases (Each Ranch)

(N)

CATEGORY	Project Years 2	3	4	5	6	7	8	9	10	11-21
SALES										
Cull Bulls 1/	-	-	-	1,190	1,530	4,250	4,760	5,610	5,610	5,610
Cull Cows 2/	-	-	-	13,910	17,680	44,720	48,750	59,020	64,870	64,870
Heifers (9-24 months) 3/	-	-	-	-	-	-	-	95,160	119,400	151,200
Steers/Bulls (9-24 months) 4/	-	-	-	-	-	-	89,840	102,880	119,040	140,240
Steers/Bulls (2-3 years) 5/	-	-	29,400	28,800	50,760	79,200	108,000	5,400	-	-
Breeding Bulls (2-3 years) 6/	-	-	-	-	-	9,000	12,600	17,640	18,000	18,000
Purchased Steers 7/	135,800	131,740	202,720	308,840	310,800	118,860	-	-	-	-
TOTAL LIVESTOCK SALES	135,800	131,740	232,120	352,740	380,770	256,030	263,950	285,710	326,920	379,920
OPERATING EXPENSES										
Salaries and Wages										
Manager	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Assistant Manager	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Chief Clerk	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Plant Operator/Mechanic	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Field Assistant) 8/	1,800	2,400	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Driver)	1,200	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Herdsman/Laborer) 9/	6,000	8,800	14,000	14,000	14,000	14,000	14,000	14,000	14,000	14,000
Guard)	1,200	1,600	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Sub-Total	21,500	26,500	32,700	32,700	32,700	32,700	32,700	32,700	32,700	32,700
Maintenance 10/										
Fencing		345	690	1,035	1,035	1,035	1,035	1,035	1,035	1,035
Firebreakes and Roads		95	135	280	280	280	280	280	280	280
Stock Handling Facilities and Dip		345	575	575	575	575	575	575	575	575
Water Supply		690	1,035	1,380	1,380	1,380	1,380	1,380	1,380	1,380
Buildings		3,410	3,810	4,060	4,060	4,060	4,060	4,060	4,060	4,060
Sub-Total		4,885	6,245	7,330	7,330	7,330	7,330	7,330	7,330	7,330
Tractor, Vehicle and Equipment Expenses										
Tractor 11/	2,250	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Four Wheel Drive Vehicle 12/	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
Truck 13/	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Power Plant		1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150
Sub-Total	5,050	8,450	8,450	8,450	8,450	8,450	8,450	8,450	8,450	8,450
Replacement of Vehicles and Equipment 14/	5,140	7,370	7,370	7,370	7,370	7,370	7,370	7,370	7,370	7,370
Animal Health										
Vaccines and Drugs 15/	3,000	5,250	7,500	9,000	9,000	9,000	9,000	9,000	9,000	9,000
Insecticides 16/	2,000	3,500	5,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Sub-Total	5,000	8,750	12,500	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Pasture Maintenance										
Improved Pasture 17/	-	11,250	22,500	33,750	33,750	33,750	33,750	33,750	33,750	33,750
Natural Pasture 18/	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Sub-Total	18,000	29,250	40,500	51,750	51,750	51,750	51,750	51,750	51,750	51,750
Miscellaneous 19/	2,735	4,260	5,390	6,130	6,130	6,130	6,130	6,130	6,130	6,130
TOTAL OPERATING EXPENSES	57,425	89,465	113,155	128,730	128,730	128,730	128,730	128,730	128,730	128,730
LIVESTOCK PURCHASES 20/										
Bulls 21/	10,850	8,050	7,700	11,200	15,050	7,500	9,100	5,950	6,300	6,300
In-Calf Cows/Heifers 22/	206,200	100,000	100,000	100,000	100,000	-	-	-	-	-
Steers 23/	197,000	147,800	225,100	226,500	86,600	-	-	-	-	-
TOTAL LIVESTOCK PURCHASES	414,050	255,850	332,800	337,700	201,650	7,500	9,100	5,950	6,300	6,300
TOTAL OPERATING EXPENSES AND LIVESTOCK PURCHASES	471,475	345,315	445,955	466,430	330,380	136,230	137,830	134,680	135,030	135,030

1/ N170 per head.
2/ N130 per head.
3/ N120 per head.
4/ N80 per head.
5/ N120 per head.
6/ N180 per head.
7/ N140 per head.
8/ N600 per year.
9/ N400 per year.
10/ 5% of construction cost beginning with year following construction.
11/ 1,500 working hours at N1.50 per hour for fuel, oil, grease, spare parts, repairs and insurance.
12/ 10,000 miles per year at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
13/ 10,000 miles per year at N 0.15 per mile for fuel, oil, grease, spare parts, repairs and insurance.
14/ 20% of cost of tractors, vehicles and equipment and 10% of cost of power plant beginning with year of acquisition.
15/ N1.50 per AU per year.
16/ N1.00 per AU per year.
17/ 2.5 cwt of triple superphosphate per ac per year at N180 per ton.
18/ 1 cwt of triple superphosphate per ac per year at N180 per ton on 2,000 ac.
19/ 5% of operating expenses.
20/ Treated as development cost in years 2-4 (see Table).
21/ N350 per head.
22/ N200 per head.
23/ N100 per head.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

WLC Ranches

General Administration - Investment and Operating Expenses
(N)

	Unit Cost	Year 2	Year 3-20
CATEGORY			
FIXED INVESTMENT			
Vehicles			
Four Wheel Drive Vehicle	4,500	4,500	
Office Furnishings			
Office Furniture	1,150	1,150	-
Office Equipment	1,150	1,150	-
Sub-Total		2,300	-
Physical Contingencies 10%		680	-
TOTAL FIXED INVESTMENT		7,480	-
OPERATING EXPENSES			
Salaries			
General Manager	7,000	7,000	7,000
Secretary/Accountant	3,000	3,000	3,000
Chief Clerk/Typist	1,600	1,600	1,600
Driver	600	600	600
Messenger	400	400	400
Sub-Total	12,600	12,600	12,600
Transport			
Vehicle Running Expenses 1/		1,560	1,560
Vehicle Replacement 2/		900	900
Sub-Total		2,460	2,460
Office			
Rental	1,150	1,150	1,150
Stationery	460	460	460
Postage	460	460	460
Telephone	575	575	575
Sub-Total	2,645	2,645	2,645
Audit and Professional Fees and Insurances		6,240	6,240
Miscellaneous		1,055	1,055
TOTAL OPERATING EXPENSES		25,000	25,000

1/ 12,000 miles per year at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
2/ 20% of cost beginning with year of acquisition.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

WLC Ranches

Cash Flow
(N)

	Before Development	Project Year 2	3	4	5	6	7	8	9	10	11	12	13	14	15 and After
Cash Inflow															
Livestock Sales - On-going Ranches	108,348	72,240	73,920	362,720	683,220	998,720	866,680	708,820	610,160	618,500	701,480	791,220	879,220	879,220	879,220
Start-up Ranches	-	407,400	395,220	696,360	1,058,220	1,142,310	768,090	791,850	857,130	980,760	1,139,760	1,139,760	1,139,760	1,139,760	1,139,760
	108,348	479,640	469,140	1,059,080	1,741,440	2,141,030	1,634,770	1,500,670	1,467,290	1,599,260	1,841,240	1,930,980	2,018,980	2,018,980	2,018,980
Development Loan 1/	-	1,482,194	1,020,635	1,260,476	1,110,620	-	-	-	-	-	-	-	-	-	-
State Government Equity Contribution 2/	-	800,000	700,000	500,000	-	-	-	-	-	-	-	-	-	-	-
Total Cash Inflow	108,348	2,761,834	2,189,775	2,819,556	2,852,060	2,141,030	1,634,770	1,500,670	1,467,290	1,599,260	1,841,240	1,930,980	2,018,980	2,018,980	2,018,980
Cash Outflow															
Fixed Investments - General Administration	-	7,480	-	-	-	-	-	-	-	-	-	-	-	-	-
- On-going Ranches	-	240,640	152,800	120,680	-	-	-	-	-	-	-	-	-	-	-
- Start-up Ranches	-	627,150	357,900	278,400	-	-	-	-	-	-	-	-	-	-	-
Livestock Purchases - On-going Ranches	76,040	-	179,800	403,200	573,500	425,900	265,500	110,500	9,800	11,200	-	-	-	-	-
- Start-up Ranches	-	1,242,150	767,550	998,400	1,013,100	604,950	22,500	27,300	17,850	18,900	18,900	18,900	18,900	18,900	18,900
Sub-total Fixed Investment and Herd Build-Up		2,117,420	1,458,050	1,800,680	1,586,600	1,030,850	288,000	137,800	27,650	30,100	18,900	18,900	18,900	18,900	18,900
Operating Expenses - General Administration	-	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
- On-going Ranches	17,108	129,944	182,810	230,650	263,080	263,080	263,080	263,080	263,080	263,080	263,080	263,080	263,080	263,080	263,080
- Start-up Ranches	-	172,275	268,395	339,465	386,190	386,190	386,190	386,190	386,190	386,190	386,190	386,190	386,190	386,190	386,190
Sub-total Cash Outflow Before Loan Service	93,148	2,444,639	1,934,255	2,395,795	2,260,870	1,705,120	962,270	812,070	701,920	704,370	693,170	693,170	693,170	693,170	693,170
Development Loan Service	-	70,404	189,888	298,241	410,868	463,023	897,025	897,025	897,025	897,025	897,025	897,025	897,025	897,025	-
Total Cash Outflow	93,148	2,515,043	2,124,143	2,694,036	2,671,738	2,168,143	1,859,295	1,709,095	1,598,945	1,601,395	1,590,195	1,590,195	1,590,195	1,590,195	712,070
Cash Balance - Annual	15,200	246,791	65,632	125,520	180,322	(27,113)	(224,525)	(208,425)	(131,655)	(2,135)	251,045	340,785	428,785	428,785	1,306,910
- Cumulative	-	-	312,423	437,943	618,265	591,152	366,627	158,202	26,547	24,412	275,457	616,242	1,045,027	1,473,812	2,780,722

1/ Development loan disbursed against 70% of total fixed investment and herd build-up. The loan is at 9½% for 13 years, including 5 years grace.
2/ The amount of the contribution is calculated to provide adequate cash cover against lags in disbursements and possible tax assessments. The latter cannot be estimated until the arrangements for taking over the ranches are known in detail.

The financial rate of return is 13.0% over 20 years based on:

(a) total cash inflow from sales.
(b) total cash outflow before loan service.
(c) incremental herd value of N 3,400,820 and
(d) annual pre-development revenues and costs as indicated.

ANNEX
Table

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NLPC Fattening Ranches (Manchok, Mokwa) 1/

Herd Projection (Each Ranch)

	Before Development	Project Year 2/ 2	3	4	5	6-21
HERD COMPOSITION						
Steers	1,500	2,000	3,500	5,000	5,000	5,000
Total Animal Units 3/	1,500	2,000	3,500	5,000	5,000	5,000
PURCHASES						
Steers	1,500	2,000	3,500	5,000	5,000	5,000
Total Purchases	1,500	2,000	3,500	5,000	5,000	5,000
MORTALITY						
Steers	45	60	105	100	100	100
Total Mortality	45	60	105	100	100	100
SALES						
Steers	1,455	1,940	3,395	4,900	4,900	4,900
Total Sales	1,455	1,940	3,395	4,900	4,900	4,900
TECHNICAL COEFFICIENTS						
Mortality %	3	3	3	2	2	2
Stocking Rate: acres/AU Manchok	4.0	3.0	1.7	1.2	1.2	1.2
Stocking Rate: acres/AU Mokwa	8.0	6.0	3.4	2.4	2.4	2.4

1/ Acreages: Manchok 6,000; Mokwa 12,000.
2/ Purchases are made mainly at the beginning and sales at the end of the year.
3/ An Animal Unit is equivalent to an animal of one year of age or more.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NLPC Fattening Ranches (Manchok, Mokwa)

Investment Costs (Each Ranch)
(₦)

CATEGORY	Unit	Unit Cost	Project Year 2 Units	2 Cost	3 Units	3 Cost	4 Units	4 Cost	TOTAL Units	TOTAL Cost
FIXED INVESTMENT										
Firebreaks and Roads										
Firebreaks and Access Tracks	Mile	70	10	700	10	700	10	700	30	2,100
Roads	Mile	230	5	1,150	5	1,150	5	1,150	15	3,450
Sub-Total				1,850		1,850		1,850		5,550
Water Development										
Dams	Unit	6,900	2	13,800	-		-		2	13,800
Bores	Unit	11,500	1	11,500	-		-		1	11,500
Waterpipes	Mile	1,150	1	1,150	1	1,150	-		2	2,300
Watertroughs	Unit	60	4	240	3	180	3	180	10	600
Sub-Total				26,690		1,330		180		28,200
Stock Handling Facilities and Fencing										
Handling Yard and Dip 1/	Unit	4,600	1	4,600	1	4,600	-		2	9,200
Fencing	Mile	700	10	7,000	10	7,000	10	7,000	30	21,000
Electrical Fencing Units	Unit	600	2	1,200	1	600	1	600	4	2,400
Sub-Total				12,800		12,200		7,600		32,600
Housing and Ranch Buildings										
Housing				14,000		2,500		1,800		18,300
Shed	Unit	4,500	1	4,500	-	-	-	-	1	4,500
Sub-Total				18,500		2,500		1,800		22,800
Vehicles and Equipment										
Four Wheel Drive Vehicle	Unit	4,500	1	4,500	1	4,500	-		2	9,000
Tractor , 60-65 HP	Unit	4,500	1	4,500	1	4,500	-		2	9,000
Disc Harrow	Unit	1,100	1	1,100	-		-		1	1,100
Disc Plough (3 furrow)	Unit	900	1	900	-		-		1	900
Rotary Cutter	Unit	800	1	800	1	800	-		2	1,600
Rotary Fertilizer Distributor	Unit	900	1	900	1	900	-		2	1,800
Trailer	Unit	800	1	800	1	800	-		2	1,600
Levelling Harrow	Unit	500	1	500	-		-		1	500
Seed Drill	Unit	1,800	1	1,800	-		-		1	1,800
Tools, etc.	Set	700	1	700	-		-		1	700
Veterinary Equipment	Set	300	1	300	-		-		1	300
Power Plant	Unit	2,800	1	2,800	-		-		1	2,800
Spares 2/				1,500		700				2,200
Sub-Total				21,100		12,200				33,300
Pasture Improvement										
Land Clearing, Seed Bed Preparation and Sowing	Ac	50	500	25,000	500	25,000	500	25,000	1,500	75,000
Fertilizer 3/	Ton	180	125	22,500	125	22,500	125	22,500	375	67,500
Seed 4/	Lb	1.20	5,000	6,000	5,000	6,000	5,000	6,000	15,000	18,000
Pesticide 5/	Gal	10	500	5,000	500	5,000	500	5,000	1,500	15,000
Sub-Total				58,500		58,500		58,500		175,500
Physical Contingencies 10%				13,960		8,820		6,970		29,750
TOTAL FIXED INVESTMENT				153,400		97,400		76,900		327,700

1/ Capacity of 1,000 head.
2/ 10% of cost of vehicles and equipment excepting four wheel drive vehicle.
3/ Assumes application of triple superphosphate at 2.5 cwt per ac at sowing and 2.5 cwt per ac 6 months later.
4/ Assumes sowing rate of 10 lb of mixture/ac.
5/ Assumes application of one gal/ac of formicide.

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NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NLPC Fattening Ranches (Manchok, Mokwa) 1/

Sales, Operating Expenses and Livestock Purchases (Each ranch)

(N)

CATEGORY	Project Years 2	3	4	5	6-21
SALES					
Steers 2/	294,880	516,040	744,800	744,800	744,800
TOTAL STEER SALES	294,880	516,040	744,800	744,800	744,800
OPERATING EXPENSES					
Salaries and Wages					
Manager	5,000	5,000	5,000	5,000	5,000
Assistant Manager	3,500	3,500	3,500	3,500	3,500
Chief Clerk	1,600	1,600	1,600	1,600	1,600
Plant Operator/Mechanic	1,200	1,200	1,200	1,200	1,200
Field Assistant 3/	1,800	2,400	3,000	3,000	3,000
Driver	1,200	2,400	2,400	2,400	2,400
Herdsman/Laborer 4/	6,000	10,000	14,000	14,000	14,000
Guard	1,200	1,600	2,000	2,000	2,000
Sub-Total	21,500	27,700	32,700	32,700	32,700
Maintenance 5/					
Fencing	100	450	800	1,150	1,150
Firebreaks	-	95	185	280	280
Stock Handling Facilities and Dip	200	490	750	780	780
Water Supply	-	1,335	1,400	1,410	1,410
Buildings	4,500	5,425	5,500	5,640	5,640
Sub-Total	4,800	7,795	8,635	9,260	9,260
Tractor, Vehicle and Equipment					
Tractor 6/	2,250	4,500	4,500	4,500	4,500
Four Wheel Drive Vehicle 7/	1,300	2,600	2,600	2,600	2,600
Power Plant	390	390	390	390	390
Sub-Total	3,940	7,490	7,490	7,490	7,490
Replacement of Vehicles and Equipment 8/	3,650	5,950	5,950	5,950	5,950
Animal Health					
Veterinary Expenses 9/	3,000	5,250	7,500	7,500	7,500
Dipping 10/	2,000	3,500	5,000	5,000	5,000
Sub-Total	5,000	8,750	12,500	12,500	12,500
Pasture Maintenance					
Sown Pasture 11/	-	11,250	22,500	33,750	33,750
Natural Pasture 12/	18,000	18,000	18,000	18,000	18,000
Sub-Total	18,000	29,250	40,500	51,750	51,750
Miscellaneous 13/	2,845	4,345	5,395	6,000	6,000
TOTAL OPERATING EXPENSES	59,735	91,280	113,170	125,650	125,650
LIVESTOCK PURCHASES					
Steer Purchases 14/	220,000	385,000	550,000	550,000	550,000
TOTAL STEER PURCHASES	220,000	385,000	550,000	550,000	550,000
TOTAL OPERATING EXPENSES AND STEER PURCHASES	279,735	476,280	663,170	675,650	675,650
NET OPERATING INCOME 15/	15,145	39,760	81,630	69,150	69,150

1/ Acreages: Manchok, 6,000; Mokwa, 12,000.
2/ N 152 per head.
3/ N600 per year.
4/ N400 per year.
5/ 5% of construction cost beginning with year following construction. Assumes values of old structures as follows: fencing, N2,000; stock handling facilities, N4,000; buildings, N90,000.
6/ 1,500 working hours per tractor at N1.50 per hour for fuel, oil, grease, spare parts, repairs and insurance.
7/ 10,000 miles per year at N 0.13 per mile for fuel, oil, grease, spare parts repairs and insurance.
8/ 20% of cost of tractors, vehicles and equipment and 10% of cost of power plant beginning with year of acquisition.
9/ N1.50 per AU per year.
10/ N1.00 per AU per year.
11/ 2.5 cwt of triple superphosphate per ac per year at N180 per ton.
12/ 1 cwt of triple superphosphate per ac per year at N180 per ton on 2,000 ac.
13/ 5% of operating expenses.
14/ N110 per head.
15/ Equals total steer sales - (total operating expenses + total steer purchases).

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NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

NLPC Fattening Ranches (Manchok, Mokwa)

General Administration - Investment and Operating Expenses
(N)

CATEGORY	Unit Cost	Project Year 2	Project Year 3-21
FIXED INVESTMENT			
Vehicles			
Four Wheel Drive Vehicle	4,500	4,500	
Office Furnishings			
Office Furniture	1,150	1,150	
Office Equipment	1,150	1,150	
Sub-Total		2,300	
Physcal Contingencies 10%		700	
TOTAL FIXED INVESTMENT		7,500	
OPERATING EXPENSES			
Salaries			
General Manager	7,000	7,000	7,000
Secretary/Accountant	3,000	3,000	3,000
Chief Clerk/Typist	1,600	1,600	1,600
Driver	600	600	600
Messenger	400	400	400
Sub-Total		12,600	12,600
Transport			
Vehicle Running Expenses 1/		1,560	1,560
Vehicle Replacement 2/		900	900
Sub-Total		2,460	2,460
Office			
Rental	1,700	1,700	1,700
Stationery	600	600	600
Postage	600	600	600
Telephone	1,100	1,100	1,100
Sub-Total		4,000	4,000
Audit and Professional fees and Insurances		3,400	3,400
Miscellaneous		1,140	1,140
TOTAL OPERATING EXPENSES		23,600	23,600

1/ 12,000 miles per year at N 0.13 per mile for fuel, oil grease, spare parts, repairs and insurance.
2/ 20% of cost beginning with year of acquisition.
3/ 5% of operating expenses.

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LIVESTOCK DEVELOPMENT PROJECT

ANNEX 8
TABLE 5

NLPC Fattening Ranches (Manchok, Mokwa)

Cash Flow

(N)

	Before Development	Project Year 2	3	4	5	6	7	8-14	15
CASH INFLOW									
Livestock Sales	480,000	589,760	1,032,080	1,489,600	1,489,600	1,489,600	1,489,600	1,489,600	1,489,600
Development Loan 1/	-	251,440	155,840	123,040	-	-	-	-	-
Federal Government Equity Contribution	-	300,000	100,000	100,000	-	-	-	-	-
TOTAL CASH INFLOW	480,000	1,141,200	1,287,920	1,712,640	1,489,600	1,489,600	1,489,600	1,489,600	1,489,600
CASH OUTFLOW									
Fixed Investments									
- General Administration	-	7,500	-	-	-	-	-	-	-
- Ranches	-	306,800	194,800	153,800	-	-	-	-	-
Steer Purchases	-	440,000	770,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
Operating Expenses									
- General Administration	-	23,600	23,600	23,600	23,600	23,600	23,600	23,600	23,600
- Ranches	-	119,470	182,560	226,340	251,300	251,300	251,300	251,300	251,300
Sub-Total		897,370	1,170,960	1,503,740	1,374,900	1,374,900	1,374,900	1,374,900	1,374,900
Ovedraft Interest	-	6,200	11,000	17,000	16,000	16,300	16,000	4,000	-
Developement Loan Service	-	11,944	31,291	44,539	84,462	84,462	84,462	84,462	-
TOTAL CASH OUTFLOW	524,336	915,514	1,213,251	1,565,279	1,475,362	1,475,662	1,475,362	1,463,362	1,374,900
CASH BALANCE									
Annual Minimum 2/	-	(311,500)	(558,000)	(854,000)	(800,200)	(817,200)	(803,200)	-	-
Annual Year End	(44,336)	225,686	74,669	147,361	14,238	13,938	14,238	26,238	114,700
Cumulative Year End	-	-	300,355	447,716	461,954	475,892	490,130	673,796	788,496
CALCULATION OF ANNUAL MINIMUM CASH BALANCE									
Opening Balance	-	-	226,000	300,000	448,000	462,000	476,000	-	-
Add-Equity Contribution	-	300,000	100,000	100,000	-	-	-	-	-
Developement Loan (25% last year+25% this year)	-	63,000	102,000	70,000	31,000	-	-	-	-
Sub-Total		363,000	428,000	470,000	479,000	462,000	476,000	-	-
Less-50% Fixed Investements	-	157,000	97,400	77,000	-	-	-		
100% Steer Purchases	-	440,000	770,000	1,100,000	1,100,000	1,100,000	1,100,000		
50% Operating Expenses	-	71,500	103,000	125,000	137,000	137,000	137,000		
50% Loan Service	-	6,000	15,600	22,000	42,200	42,200	42,200		
Sub-Total		674,500	986,000	1,324,000	1,279,200	1,279,200	1,279,200		
Minimum Cash Balance (Overdraft)	-	(311,500)	(558,000)	(854,000)	(800,200)	(817,200)	(803,200)		

1/ Developement Loan disbursed against 80% of fixed investments. The loan is at 9 1/2% for 13 years, including 3 years grace.
2/ Overdraft facilities of up to about N 800,000 will be required in PY 2-7. Interest is estimated at 2% of the annual minimum balance.

The financial Rate of return is 17.8% based on: - (a) total cash inflow from sales;
(b) total cash outflow before oveedraft interest + loan service;
(c) treating incremental steer purchases as permanent working capital until PY 21, when the herd is assumed to be sold;
(d) taking no account of pre-developement losses or such costs.

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LIVESTOCK DEVELOPMENT PROJECT

Private Breeding/Fattening Ranch - 2,400 ac

Herd Projection

	Before Development	Project Year 2	3	4	5	6	7	8	9-21
HERD COMPOSITION									
Bulls	3	3	5	7	9	11	12	12	12
Breeding Cows	50	80	130	200	270	302	302	302	302
Weaners	25	25	40	78	140	202	241	241	241
Heifers 9-24 months	12	12	12	19	38	68	99	118	118
Steers 9-24 months	12	12	12	19	38	68	99	118	118
Heifers 2-3 years	11	11	-	-	-	-	-	-	-
Steers 2-3 years	12	12	-	-	-	-	-	-	-
Steers, Purchased		120	151	125	75	41	38	-	-
Total Animals	125	275	350	448	570	692	791	791	791
Total Animal Units 1/	100	250	310	370	430	490	550	550	550
PURCHASES									
Bulls	1	-	3	3	3	4	4	4	4
In-calf Cows Heifers	-	21	30	62	56	-	-	-	-
Steers	-	120	151	125	75	41	38	-	-
Total Purchases	1	141	184	190	134	45	42	4	4
MORTALITY									
Bulls	-	-	-	1	-	1	-	-	-
Breeding Cows	2	2	2	3	4	5	6	6	6
Weaners	1	1	1	2	2	4	4	5	5
Heifers 9-24 months	1	1	1	1	1	1	1	2	2
Steers 9-24 months	-	-	-	-	-	1	1	2	2
Heifers 2-3 years	0	0	-	-	-	-	-	-	-
Steers 2-3 years	1	1	1	-	-	-	-	-	-
Steers, Purchased	-	-	4	3	3	2	1	1	-
Total Mortality	5	5	9	10	10	14	13	16	15
SALES									
Cull Bulls	1	-	1	-	1	1	3	4	4
Cull Cows	5	-	-	-	-	-	30	45	45
Heifers 2-3 years	-	-	-	-	-	-	31	46	65
Steers 2-3 years	-	-	12	12	19	37	67	97	116
Heifers 3-4 years	4	-	-	-	-	-	-	-	-
Steers 3-4 years	11	11	11	-	-	-	-	-	-
Steers, Purchased	-	-	116	148	122	73	40	37	-
Total Sales	21	11	140	160	142	111	171	229	230
TECHNICAL COEFFICIENTS									
Calves Weaned %	50	50	50	60	70	75	80	80	80
Mortality %	3	3	3	2	2	2	2	2	2
Culling Rate Bulls %	30	0	30	0	14	13	25	30	30
Culling Rate Cows %	10	0	0	0	0	0	10	15	15
Culling Rate Heifers 2-3 years %	0	0	0	0	0	0	46	48	55
Culling Rate Heifers 3-4 years %	36	0	0	0	0	0	0	0	-
Bulls as % of Breeding Females	3	3	3	3	3	3	3	3	3
Stocking Rate: acres/AU	24	9.6	7.7	6.5	5.6	4.9	4.4	4.4	4.4

1/ An Animal Unit is equivalent to an animal of one year of age or more.

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LIVESTOCK DEVELOPMENT PROJECT

Private Breeding/Fattening Ranch - 2,400 ac

Investment Costs
(N)

			Project Year							
		Unit	-------2------		-------3------		-------4------		TOTAL	
CATEGORY	Unit	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
FIXED INVESTMENT										
Firebreaks and Roads										
Firebreaks	Mile	70	10	700	-	-	-	-	10	700
Water Development										
Dams	Unit	4,600	1	4,600	-	-	-	-	1	4,600
Stock Handling Facilities and Fencing										
Handling Yard and Dip	Unit	1,800	1	1,800	-	-	-	-	1	1,800
Fencing: Improved Pasture	Mile	700	1-1/2	1,050	1	700	1	700	3-1/2	2,450
Boundary	Mile	350	8	2,800	-	-	-	-	8	2,800
Sub-Total				5,650		700		700		7,050
Housing and Ranch Buildings										
House: Manager	Unit	900	1	900	-	-	-	-	1	900
Storage Shed	Unit	500	1	500	-	-	-	-	1	500
Sub-Total				1,400		-		-		1,400
Tools and Equipment										
Tools, etc.	Set	120	1	120	-	-	-	-	1	120
Veterinary Equipment	Set	50	1	50	-	-	-	-	1	50
Sub-Total				170		-		-		170
Pasture Improvement										
Land Clearing, Seed Bed Preparation and Sowing	Ac	35	50	1,750	50	1,750	50	1,750	150	5,250
Fertilizer 1/	Ton	180	12.5	2,250	12.5	2,250	12.5	2,250	37.5	6,750
Seed 2/	Lb	1.20	500	600	500	600	500	600	1,500	1,800
Pesticide 3/	Gal	10	50	500	50	500	50	500	150	1,500
Sub-Total				5,100		5,100		5,100		15,300
Physical Contingencies 10%				1,760		580		580		2,920
TOTAL FIXED INVESTMENT				19,380	6,	6,380		6,380		32,140

1/ Assumes application of triple superphosphate at 2.5 cwt per ac at sowing and 2.5 cwt per ac 6 months later.
2/ Assumes sowing rate of 10 lb of mixture/ac.
3/ Assumes application at rate of one gal/ac of formicide.

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LIVESTOCK DEVELOPMENT PROJECT

Private Breeding/Fattening Ranch - 2400 ac

Sales, Operating Expenses and Livestock Purchases

(N)

CATEGORY	Before Development	Project Years 2	3	4	5	6	7	8	9-20
SALES									
Cull Bulls 1/	185	-	185	-	185	185	555	740	740
Cull Cows 2/	725	-	-	-	-	-	4,350	6,525	6,525
Heifers (2-3 years) 3/	-	-	-	-	-	-	6,200	9,200	13,000
Steers/Bulls (2-3 years) 4/	-	-	1,620	1,620	2,565	4,995	9,045	13,095	15,660
Heifers (3-4 years) 5/	800	-	-	-	-	-	-	-	-
Steers/Bulls (3-4 years) 6/	2,090	2,090	2,090	-	-	-	-	-	-
Purchased Steers 7/			17,400	22,200	18,300	10,950	6,000	5,550	-
TOTAL LIVESTOCK SALES	3,800	2,090	21,295	23,820	21,050	16,130	26,150	35,110	35,925
OPERATING EXPENSES									
Salaries and Wages									
Manager's Wage		1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Herdsman 8/		600	900	1,200	1,200	1,200	1,200	1,200	1,200
Laborer 8/		300	300	300	300	300	300	300	300
Sub-Total		2,100	2,400	2,700	2,700	2,700	2,700	2,700	2,700
Maintenance 9/									
Fencing			195	265	265	265	265	265	265
Firebreaks			35	35	35	35	35	35	35
Stock Handling Facilities and Dip			95	95	95	95	95	95	95
Water Supply			230	230	230	230	230	230	230
Buildings			70	70	70	70	70	70	70
Sub-Total			625	695	695	695	695	695	695
Replacement of Tools and Equipment 10/		40	40	40	40	40	40	40	40
Animal Health									
Vaccines and Drugs 11/		375	465	555	645	735	825	825	825
Insecticides 12/		250	310	370	430	490	550	550	550
Sub-Total		625	775	925	1,075	1,225	1,375	1,375	1,375
Pasture Maintenance									
Sown Pasture 13/			1,125	2,250	3,375	3,375	3,375	3,375	3,375
Natural Pasture		1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Sub-Total		1,800	2,925	4,050	5,175	5,175	5,175	5,175	5,175
Land Rent 15/		480	480	480	480	480	480	480	480
Cattle Tax 16/		190	235	280	325	370	415	415	415
Miscellaneous 17/		260	375	460	525	535	545	545	545
TOTAL OPERATING EXPENSES	1,260	5,455	7,855	9,630	11,015	11,220	11,425	11,425	11,425
LIVESTOCK PURCHASES 18/									
Bulls 19/	200	-	900	900	900	1,200	1,200	1,200	1,200
In-Calf Cows/Heifers 20/	-	4,200	6,000	12,400	11,200	-	-	-	-
Steers 21/	-	12,600	15,855	13,125	7,875	4,305	3,990	-	-
TOTAL LIVESTOCK PURCHASES	200	16,800	22,755	26,425	19,975	5,505	5,190	1,200	1,200
TOTAL OPERATING EXPENSES AND LIVESTOCK PURCHASES	1,460	22,255	30,610	36,055	30,990	16,725	16,615	12,625	12,625

1/ N185 per head
2/ N145 per head
3/ N200 per head
4/ N135 per head
5/ N200 per head
6/ N190 per head
7/ N150 per head
8/ N300 per year
9/ 5 % of construction cost beginning with year following construction.
10/ 20% of cost beginning with year of acquisition.
11/ N1.50 per A.U. per year.
12/ N1.00 per A.U. per year.
13/ 2.5 cwt of triple superphosphate per ac per year at N180 per ton.
14/ 1 cwt of triple superphosphate per ac per year at N180 per ton on 200 ac.
15/ N0.20 per ac per year.
16/ N0.75 per A.U. per year.
17/ 5% of operating expenses.
18/ Treated as development costs in years 1-3
19/ N300 per head
20/ N200 per head
21/ N105 per head

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Private Ranches Development Projections

Cash Flow

(N)

	Project Year								
	2	3	4	5	6	7	8	9-16	17
Cash Inflow									
Livestock Sales	2,090	21,295	23,820	21,050	16.130	26,150	35,110	35,925	35,925
Development Loan	28,994	23,308	26,244	15,980	-	-	-	-	-
Rancher Contribution:									
Initial herd	15,525	-	-	-	-	-	-	-	-
Cash	10,000	-	2,000	4,000	4,000	-	-	-	-
Total Cash Inflow	56,609	44,603	52,064	41,030	20,130	26,150	35,110	35,925	35,925
Cash Outflow									
Fixed Investments	19,380	6,380	6,380	-	-	-	-	-	-
Livestock Purchases - Breeding Stock	4,200	6,900	13,300	12,100	1,200	1,200	1,200	1,200	1,200
- Steers	12,600	15,855	13,125	7,875	4,305	3,990	-	-	-
	36,180	29,135	32,805	19,975	5,505	5,190	1,200	1,200	1,200
Initial Herd	15,525	-	-	-	-	-	-	-	-
Operating Expenses	5,455	7,855	9,630	11,015	11,220	11,425	11,425	11,425	11,425
Sub-total	57,160	36,990	42,435	30,990	16,725	16,615	12,625	12,625	12,625
Loan Service	1,377	2,484	4,838	6,844	7,603	15,055	15,055	15,055	-
Total Cash Outflow	58,537	39,474	47,273	37,834	24,328	31,670	27,680	27,680	12,625
Cash Balance - Annual	(1,928)	5,129	4,791	3,196	(4,198)	(5,520)	7,430	8,245	23,300
- Cumulative	-	3,201	7,992	11,188	6,990	1,470	8,900	74,205	97,505

1/ Development loan disbursed against 80% of fixed investment and livestock purchases in PY 2-5 The loan is at 9½% for 15 years, including a grace period of 5 years.

The financial rate of return to the individual farmer/trader is 13% over 20 years based on:

(a) total cash inflow from sales
(b) total cash outflow before loan service and
(c) opening and closing herd values of N 15,525 and N 84,070 respectively.

The financial rate of return to the project component, taking into account the timing of farmers' participation remain 13%.

ANNEX 9
TABLE 4

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Cattle Fattening by Smallholders

1. General. Cattle fattening, mainly of mature oxen, and carried out after harvest with crop residues and some supplementary feed is moderately widespread throughout northern Nigeria. It has been practised by Hausa farmers, butchers, and cattle traders on a small scale for several decades; but its spread during the last few years has increased considerably due to rapidly rising meat prices. In many cases, fattening amounts to little more than conserving liveweight through the dry season, but more and more it is being undertaken to profit from modest weight gains and from seasonal price increases, the most significant being those occurring between about the end of the dry season and the middle of the wet season. Fattening techniques are generally inefficient, but could be improved significantly through better advice on management, better animal health services, and the greater use of supplementary feed and crop residues that are available in Nigeria. It also appears that more farmers would undertake fattening if credit were available for purchasing feeder animals. Most farmers are too poor to buy animals and thus are denied the opportunity of profitably using crop residues and benefiting from the production of farm yard manure.

2. Subproject Description. The purpose of the subproject would be to conduct a pilot beef cattle fattening scheme with the objectives of developing appropriate fattening techniques, cattle purchase and sale procedures, and credit arrangements (including cattle insurance), as well as training both farmers and extension personnel in efficient cattle fattening techniques. The results of the pilot scheme should determine whether small-scale fattening operations should be further promoted by Government.

3. Individuals selected to participate would have had previous experience in cattle management (this could be by owning and operating draught oxen) and would have the capacity to provide the simple facilities needed for confining and feeding the animals, and sufficient labor to care for the animals purchased with the credit. The number of animals to be finished on each fattening unit would be determined by (i) the estimated production capacity for roughage and crop residues of the farm, and (ii) the management and organizational ability of the potential cattle fattener. At full development, about 1,500 fatteners, finishing a total of about 7,500 animals per year, would participate in the scheme, which would be located in three selected areas of about 10 x 10 mi each, two in NE and one in NL State. Incremental production would be about 640 mt liveweight per annum valued at about N 315,000.

4. The majority of loans would be to small farmers, who would finish about three animals per year during an appropriate six-month period. Credit would be made available for both cattle and supplementary feed such as cotton seed, rice bran and middlings, groundnut and cotton seed cake, groundnut stalks, and salt. Credits for cattle and for feed would be made in kind by the subproject management. All cattle would be provided with free prophylactic treatment against trypanosomiasis where necessary. Fat cattle would be marketed with the assistance of subproject management, and credit recovery would take place at the point of sale.

5. Cost and Profit to the Cattle Fattener. The cost of fattening one animal over about 180 days, and the profit from this operation, assuming a daily liveweight gain of 1 lb, is estimated as follows:

		Unit	Unit Cost N	No. of Units	Total Cost N
A.	Operating Costs				
	1. Purchase of Feeder /1	head	110.0	1	110.0
	2. Feed Concentrate /2	cwt	5.0	4	20.0
	3. Groundnut Stalks	cwt	0.8	10	8.0
	Subtotal				138.0
B.	Sales /1	head	160.0	1	160.0
C.	Gross Operating Income				22.0
D.	Interest Charge and Insurance				
	1. Interest Charges /3				6.6
	2. Cattle Insurance				2.0
E.	Net Operating Income				13.4

/1 Purchase and sale price per lb liveweight = N 0.225.
/2 Cotton seed, rice bran/middlings, groundnut and cotton seed cake, etc., and salt.
/3 9-1/2% per year.

The estimated net income to the cattle fattener of about N 13.4 per fattened animal is considered satisfactory, especially since this could be increased through alert marketing to take advantage of seasonal price differences; through long-term delivery contracts between the scheme and wholesale meat dealers in main consumption centers; and through purchasing supplementary feed directly after harvest when prices are low. LPU would provide marketing assistance to subproject participants.

6. Subproject feeder cattle and credit requirements would be as follows:

Annual Requirements of Feeder Cattle

Years	Area I	Area II	Area III	Total
	----------Head----------			
1	800			800
2	1,500			1,500
3	2,000	1,000		3,000
4	2,500	2,000	1,500	6,000
5-20	2,500	2,500	2,500	7,500

Annual Credit Requirements

Years	No. of Feeder Cattle	Cost of Feeders /1	Cost of Supplementary Feed /2	Total Credit Volume
	----Head-----	----------N----------		
1	800	88,000	22,400	110,400
2	1,500	165,000	42,000	207,000
3	3,000	330,000	84,000	4414,000
4	6,000	660,000	168,000	828,000
5-20	7,500	825,000	210,000	1,035,400

/1 N 110 per feeder.
/2 N 28 per feeder.

7. In view of the scheme's pilot nature, Government would guarantee loans made under the scheme by NAB to fatteners. Appropriate measures would be taken to prevent the misuse of credits and stock purchased with NAB loans would be branded and serve as part of the security for such loans.

8. Organization and Management. A LPU ranch technical officer reporting to the Deputy Project Manager - North would be responsible for day-to-day implementation of the scheme, including purchase of feeders and sale of fat animals, evaluation of the fattening capacity of applicants' farms, and training of scheme personnel. He would be directly assisted in each of the three project areas by one livestock and two veterinary field assistants provided by the NE State Ministry of Agriculture and Natural Resources. In addition the subproject would receive technical support as needed from district veterinary and agricultural service staff operating in subproject areas.

ANNEX 11
Table 1

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Grazing Reserves

Fulani Graziers - 64,000 acres 1/

Investment Costs (Each Unit)
(N)

	Unit	Unit Cost	Project Yr. 2 and Total No. of Unit	Costs
FIXED INVESTMENT				
Firebreaks and roads				
Firebreaks and access tracks	Mile	70	60	4,200
Roads	Mile	230	10	2,300
Subtotal				6,500
Water Development - Dam	Unit	4,600	2	9,200
Stock handling facilities and fencing				
Handling yard, dip, holding paddocks	Unit	7,000	1	7,000
Cattle schale	Unit	2,300	1	2,300
Subtotal				9,300
Housing and ranch buildings				
House: Range Officer	Unit	10,000	1	10,000
Field Assistant	Unit	1,000	2	2,000
Laborer	Unit	500	4	2,000
Office/Storeroom	Unit	2,000	1	2,300
Subtotal				13,600
Vehicles and equipment				
Four wheel drive vehicle	Unit	4,500	1	4,500
Veterinary equipment	Set	300	1	300
Tools	Set	400	1	400
Subtotal				5,200
Physical contingencies 10%				4,650
TOTAL FIXED INVESTMENT				51,150

1/ Representing one unit of 100 sq miles located in North-Eastern and North-Western States.

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NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Grazing Reserves

Fulani Graziers - 64,000 ac 1/

Operating Expenses and Grazing Fees (Each Unit)

(₦)

OPERATING EXPENSES	Project Years							
	2	3	4	5	6	7	8	9-11
Salaries and Wages								
Range Development Officer	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Field Assistant 2/	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Laborer 3/	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600
Sub-Total	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800
Maintenance 4/								
Firebreaks and Roads		330	330	330	330	330	330	330
Dams		460	460	460	460	460	460	460
Stock Handling Facilities		470	470	470	470	470	470	470
Housing and Ranch Buildings		820	820	820	820	820	820	820
Sub-Total		2,080	2,080	2,080	2,080	2,080	2,080	2,080
Vehicle Expenses								
Four wheel drive vehicle 5/	1,560	1,560	1,560	1,560	1,560	1,560	1,560	1,560
Vehicle Replacement 6/	900	900	900	900	900	900	900	900
Animal Health								
Vaccines & Drugs	2,250	2,400	2,550	2,700	2,850	3,000	3,150	3,750
Dipping 8/	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,500
Sub-Total	3,750	4,000	4,250	4,500	4,750	5,000	5,250	6,250
Miscellaneous	690	810	830	860	850	860	880	930
TOTAL OPERATING EXPENSES	14,700	17,150	17,420	17,700	17,940	18,200	18,470	19,520

1/ Representing one unit of 100 sq miles located in North-Eastern and North-Western States.
2/ ₦ 600 per year.
3/ ₦ 400 per year.
4/ 5% of construction cost beginning with the year following construction.
5/ 12,000 miles per year at ₦ 0.13 per mile for fuel oil, grease, spare parts and insurance.
6/ 20% of cost beginning with year of acquisition.
7/ ₦ 1.50 per A.U. per year.
8/ ₦ 1.00 per A.U. per year.

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NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Grazing Reserves

Benefits of Fulani Grazing Reserve (Unit = 64,000 ac) 1/

	Unit	Before Development	Project Years 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
CATTLE																							
Carrying Capacity 2/	Head	1,400	1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200	2,300	2,400	2,500	2,600	2,700	2,800	2,800	2,800	2,800	2,800	2,800	2,800
Stock End of Year																							
(a) Without the Project 3/	Head	1,400	1,400	1,386	1,372	1,358	1,344	1,331	1,318	1,305	1,292	1,280	1,267	1,254	1,241	1,229	1,217	1,205	1,193	1,181	1,169	1,157	1,145
(b) With the Project 4/	Head	1,400	1,400	1,442	1,485	1,530	1,567	1,623	1,672	1,722	1,774	1,827	1,882	1,938	1,996	2,056	2,118	2,182	2,247	2,314	2,400	2,400	2,400
Offtake																							
(a) Without the Project																							
(i) Normal sales 10%	Head	140	140	139	137	136	134	133	132	131	129	128	127	125	124	123	122	121	119	118	117	116	115
(ii) Stress sales 1%	Head	-	-	14	14	14	13	13	13	13	13	13	13	13	12	12	12	12	12	12	12	12	12
Sub-total	Head	140	140	153	151	150	147	146	145	144	142	141	140	138	136	135	134	133	131	130	129	128	127
(b) With the Project																							
(i) Offtake		10	10	9	11	13	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
(ii) Sales	Head	140	130	130	163	199	236	234	251	258	266	274	282	291	299	308	318	327	337	347	360	360	360
Value of Production																							
(a) Without the Project	N 140/Head	19,600	21,420	21,420	21,140	21,000	20,580	20,440	20,300	20,160	19,880	19,740	19,600	19,320	19,040	18,900	18,760	18,620	18,340	18,200	18,060	17,920	17,780
(b) With the Project	N 150/Head	-	19,500	19,500	24,450	29,850	35,400	35,100	37,650	38,700	39,900	41,100	42,300	43,650	44,850	46,200	47,700	49,050	50,550	52,050	54,000	54,000	54,000
Incremental Offtake and Residual Herd Value	N	-	(1,920)	(1,920)	3,310	8,850	14,820	14,660	17,350	18,540	20,020	21,360	22,700	24,330	25,810	27,300	28,940	30,430	32,210	33,850	35,940	36,080	271,350 7/
SHEEP AND GOATS																							
Stock End of Year 4/	Head	1,400	1,400	1,400	1,490	1,530	1,580	1,620	1,670	1,720	1,770	1,830	1,880	1,940	2,000	2,060	2,120	2,180	2,250	2,310	2,400	2,400	2,400
Offtake 5/	%	20	20	20	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Offtake	No.	280	280	288	373	383	395	405	418	430	443	458	470	485	500	515	530	545	563	578	600	600	600
Offtake Value 6/	N	3,360	4,200	4,320	5,595	5,745	5,925	6,075	6,270	6,450	6,645	6,870	7,050	7,275	7,500	7,725	7,950	8,175	8,445	8,670	9,000	9,000	9,000
Incremental and Residual Herd Value	N	-	840	960	2,235	2,385	2,565	2,715	2,910	3,090	3,285	3,510	3,690	3,915	4,140	4,365	4,590	4,815	5,085	5,310	5,640	5,640	20,440 7/
Total Incremental Offtake and Residual Herd Value	N	-	(1,080)	(1,080)	5,545	11,235	17,386	17,375	20,260	21,630	23,305	24,870	26,390	28,245	29,950	31,665	33,530	35,245	37,295	39,160	41,580	41,720	291,790 7/
Grazing Fees 8/	N	-	700	721	743	765	784	812	836	861	887	914	941	969	998	1,028	1,059	1,091	1,124	1,157	1,200	1,200	1,200
TOTAL INCREMENTAL BENEFITS	N	-	(380)	(359)	6,288	12,000	18,169	18,187	21,096	22,491	24,192	25,784	27,331	29,214	30,948	32,693	34,589	36,336	38,419	40,317	42,780	42,920	292,990

1/ Future grazing reserves are already fully exploited by nomatic herds

2/ Carrying capacity before development = 2,500 cattle during 6 months/year (rainy season) and 300 cattle during 6 months/year (dry season) = 1,400 cattle on a year round basis. Carrying capacity will double in 14 years

3/ Without the project, carrying capacity and therefore cattle herd will decrease by 1% per year, due to expansion of agriculture, overgazing and bush-fires.

4/ With the project the cattle herd and sheep/goat flock is increasing by 3% per year, until they reach maximum size that can be supported.

5/ Does not include subsistence offtake

6/ N 12 per animal before development and in year PY 1: afterwards N 15 per animal.

7/ Residual herd value.

8/ N 0.50 per A. U. per year.

ANNEX 11
Table 5

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Grazing Reserves

Kukar Jangarai - 300,000 ac.

Investment Costs
(N)

			Project Year 2		Project Year 3		Project Year 4		TOTAL	
	Unit	Unit Cost	No. Units	Cost	No. Units	Cost	No. Units	Cost	No. Units	Cost
FIXED INVESTMENT										
Stock Handling Facilities and Fencing										
Handling Yard, Dip, Holding Paddocks	Unit	7,000	1	7,000	-	-	-		1	7,000
Fencing	Mile	700	4	2,800	4	2,800	4	2,800	12	8,400
Sub-Total				9,800		2,800		2,800		15,400
Housing and Ranch Buildings										
House: Range Office	Unit	10,000	1	10,000	-	-	-	-	1	10,000
Field Assistant	Unit	1,000	2	2,000	-	-	-	-	2	2,000
Laborer	Unit	500	4	2,000	-	-	-	-	4	2,000
Office/Storeroom	Unit	2,500	1	2,500	-	-	-	-	1	2,500
Sub-Total				16,500						16,500
Vehicles and Equipment										
Four Wheel Drive Vehicle	Unit	4,500	1	4,500	-	-	-	-	1	4,500
Veterinary Equipment	Set	300	1	300	-	-	-	-	1	300
Tools	Set	400	1	400	-	-	-	-	1	400
Sub-Total				5,200						5,200
Pasture Improvement										
Land Clearing, Seed Bed Preparation and Sowing	Ac	55	500	27,500	500	27,500	500	27,500	1,500	82,500
Fertilizer 1/	Ton	180	125	22,500	125	22,500	125	22,500	375	67,500
Seed 2/	Lb	1.20	5,000	6,000	5,000	6,000	5,000	6,000	15,000	18,000
Pesticide 3/	Gal	10	500	5,000	500	5,000	500	5,000	1,500	15,000
Sub-Total				61,000		61,000		61,000		183,000
Physical Contingencies 10%				9,250		6,380		6,380		22,000
TOTAL FIXED INVESTMENT				101,750		70,180		70,180		242,000

ANNEX 11
Table 4

1/ Assumes application of triple superphosphate at 2.5 cwt per ac at sowing and 2.5 cwt per ac 6 months later.

2/ Assumes sowing rate of 10 lb of mixture/ac.

3/ Assumes application of formicide at the rate of one gal/ac.

December 14, 1973.

ANNEX 11
Table 5

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Grazing Reserves

Kukar Jangarai - 300,000 ac

Operating Expenses, Grazing Fees and Incremental Production

	----- Project Year -----			
OPERATING EXPENSES	2	3	4	5-21
Salaries and Wages				
Range Development Officer	5,000	5,000	5,000	5,000
Field Assistant 1/	1,200	1,200	1,200	1,200
Laborer 2/	1,600	1,600	1,600	1,600
Subtotal	7,800	7,800	7,800	7,800
Maintenance				
Stock handling facilities, fencing and buildings 3/		1,310	1,450	1,590
Vehicle Expenses				
Four wheel vehicle 4/	1,560	1,560	1,560	1,560
Vehicle Replacement 5/	900	900	900	900
Pasture Maintenance				
Fertilizer 6/	-	11,250	22,500	33,750
Miscellaneous 7/	515	1,140	1,710	2,280
TOTAL OPERATING EXPENSES	10,775	₦3,960	35,920	47,880
GRAZING FEES 8/	-	2,400	4,800	7,200
INCREMENTAL PRODUCTION				
Increased carrying capacity (AU)	-	1,000	2,000	3,000
Offtake 10%	-	100	200	300
Value of Offtake 9/	-	16,000	32,000	48,000

1/ ₦ 600 per year.
2/ ₦ 400 per year.
3/ 5 % of cost of construction **beginning** with the year following construction.
4/ 12,000 miles per year at ₦ 0.13 per mile for fuel oil, grease, spare parts, repairs and insurance.
5/ 20% of cost of vehicle beginning with year of acquisition.
6/ 2.5 cwt of triple superphosphate per ac per year at ₦ 180 per ton.
7/ 5% of Operating Expenses.
8/ ₦ 2.40 per AU per year on assumed carrying capacity of 1,000 AU in year 2; 2,000 AU in year 3; and 3,000 in year 4 onwards.
9/ ₦ 160 per head.

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NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

LPU Investment, Operating and Technical Service Costs

(N)

CATEGORY	Unit Cost	No. Units	Project Years 1	2	3	4	5	6	7	8	Total Cost
FIXED INVESTMENT											
Vehicles											
Four Wheel Drive Vehicle	4,500	8	36,000	-	-	-	36,000	-	-	-	72,000
Staff Vehicle	3,500	3	10,500	-	-	-	10,500	-	-	-	21,000
Pick-up Truck (15 cwt)	5,000	3	15,000	-	-	-	15,000	-	-	-	30,000
Sub-Total			61,500				61,500				123,000
Office Furnishings											
Office Furniture			8,000	-	-	-	-	-	-	-	8,000
Office Equipment			8,000	-	-	-	-	-	-	-	8,000
Sub-Total			16,000								16,000
Physical Contingencies 10%			8,000	-	-	-	6,100	-	-	-	14,100
TOTAL FIXED INVESTMENT			85,500	-	-	-	67,600	-	-	-	153,100
OPERATING EXPENSES											
Salaries and Wages											
Project Manager)	27,000 p.a.	1	27,000	27,000	27,000	27,000	27,000	27,000	-	-	162,000
Ranch Planning Officer) 1/	23,000 p.a.	1	23,000	23,000	23,000	23,000	23,000	23,000	-	-	138,000
Accountant)	23,000 p.a.	1	23,000	23,000	23,000	23,000	23,000	23,000	-	-	138,000
Ranch Technical Officer)	17,000 p.a.	3	51,000	51,000	51,000	51,000	51,000	51,000	-	-	306,000
Deputy Project Manager 2/	8,000 p.a.	2	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000	128,000
Counterpart Staff	5,000 p.a.	7	35,000	35,000	35,000	35,000	35,000	35,000	35,000	35,000	280,000
Secretary	3,000 p.a.	1	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	24,000
Assistant Secretary	2,000 p.a.	3	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	48,000
Chief Clerk/Typist	1,600 p.a.	2	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	25,600
Driver	600 p.a.	10	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	48,000
Messenger	400 p.a.	4	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	12,800
Sub-Total			194,800	194,800	194,800	194,800	194,800	194,800	70,800	70,800	1,310,400
OTHER EXPENSES											
Vehicle Running											
Four Wheel Drive Vehicle 3/			12,500	12,500	12,500	12,500	12,500	12,500	12,500	12,500	100,000
Staff Vehicle 4/			2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	23,200
Pick-up Truck (15 cwt) 5/			4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700	37,600
Repairs and Maintenance											
Office Furnishings 6/			1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	12,800
Per Diem Allowances:											
Professional Staff 7/			4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	32,800
Non-professional Staff 8/			1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600	12,800
Office Expenses											
Telephone, Postage, etc.			2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	18,400
Sub-Total			29,600	29,600	29,600	29,600	29,600	29,600	29,600	29,600	236,800
Miscellaneous 9/			22,600	22,600	22,600	22,600	22,600	22,600	10,600	10,600	156,800
TOTAL OPERATING EXPENSES			247,000	247,000	247,000	247,000	247,000	247,000	111,000	111,000	1,704,000
TECHNICAL SERVICES											
Consultants 10/	6,000/mo	52	72,000	72,000	72,000	20,000	19,000	19,000	19,000	19,000	312,000
Establishment of Pilot Seed Production Program 11/			-	41,500	23,000	-	-	-	-	-	64,500
Out of Country Training of Counterpart staff 12/	6,000/yr	16	-	24,000	24,000	24,000	24,000	-	-	-	96,000
TOTAL TECHNICAL SERVICES COSTS			72,000	137,500	119,000	44,000	43,000	19,000	19,000	19,000	472,500

1/ Allocation for expatriate appointees includes base salary plus gratuity of 10%, travel and resettlement expenses and educational allowance.
2/ Assumes appointment of one Nigerian Deputy for Western State activities to be located in Ibadan and one to work directly with the Project Director in Kaduna.
3/ 12,000 miles per year per vehicle at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
4/ 12,000 miles per year per vehicle at N 0.08 per mile for fuel, oil, grease, spare parts, repairs and insurance.
5/ 12,000 miles per year per vehicle at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
6/ 10% of cost beginning with year of acquisition.
7/ N10 per day for four professional staff for an average of 100 days per year.
8/ N4 per day for four non-professional staff for an average of 100 days per year.
9/ 10% of operating expenses.
10/ 12 man months to undertake annual evaluation of the project; 12 man months consultant to carry out a livestock taxation study; 2 man months to prepare terms of reference for a study of reclamation of lands cleared from tsetse flies and 26 man months to prepare follow-up livestock projects.
11/ 4 man months consultancy in FY 2.
12/ 16 man years of advanced training in grassland/animal production commencing in FY 2.

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Research and Training Center (Mokwa)[1]

Investment and Operating Expenses

(N)

CATEGORY	Unit Cost	No. Units	Project Years 2	3	4	5	6	Total Cost
FIXED INVESTMENT								
Field Experimentation 2/	-	-	9,200	9,200	9,200	9,200	9,200	46,000
Teaching Facilities and Equipment	-	-	9,200	4,600	4,600	4,600	4,600	27,600
Student Housing 3/	-	-	19,800	-	-	-	-	19,800
Four Wheel Drive Vehicle	4,500	4	18,000	-	-	-	-	18,000
Wheel Tractor, 65 HP	4,500	2	9,000	-	-	-	-	9,000
Sub-Total			65,200	13,800	13,800	13,800	13,800	120,400
Physical Contingencies 10%			6,500	1,400	1,400	1,400	1,400	12,100
TOTAL FIXED INVESTMENT			71,700	15,200	15,200	15,200	15,200	132,500
OPERATING EXPENSES								
Salaries and Wages								
Officer in Charge - Livestock Production)	23,000	1	23,000	23,000	23,000	23,000	23,000	115,000
Research Officer - Pasture Production) 4/	20,000	1	20,000	20,000	20,000	20,000	20,000	100,000
Research Officer - Mechanization)	20,000	1	20,000	20,000	20,000	20,000	20,000	100,000
Counterpart Staff 5/	5,000	6	30,000	30,000	30,000	30,000	30,000	150,000
Secretary	3,000	1	3,000	3,000	3,000	3,000	3,000	15,000
Chief Clerk	1,600	1	1,600	1,600	1,600	1,600	1,600	8,000
Field Assistant	600	6	3,600	3,600	3,600	3,600	3,600	18,000
Tractor Driver	600	2	1,200	1,200	1,200	1,200	1,200	6,000
Messenger/Cleaner	400	2	800	800	800	800	800	4,000
Laborer	400	6	2,400	2,400	2,400	2,400	2,400	12,000
Sub-Total			105,600	105,600	105,600	105,600	105,600	528,000
Tractor and Vehicle Expenses								
Crawler Tractor 6/			5,400	5,400	5,400	5,400	5,400	27,000
Wheel Tractor 7/			4,500	4,500	4,500	4,500	4,500	22,500
Wheel Tractor Replacement 8/			1,800	1,800	1,800	1,800	1,800	9,000
Four Wheel Drive Vehicle 9/			5,200	5,200	5,200	5,200	5,200	26,000
Vehicle Replacement 8/			3,600	3,600	3,600	3,600	3,600	18,000
Sub-Total			20,500	20,500	20,500	20,500	20,500	102,500
Travel and Living Expenses								
Students 10/			24,000	24,000	24,000	24,000	24,000	120,000
Teaching Staff 11/			5,000	5,000	5,000	5,000	5,000	25,000
Sub-Total			29,000	29,000	29,000	29,000	29,000	145,000
Maintenance 12/			1,900	2,600	3,300	4,000	4,700	16,500
Miscellaneous 13/			7,300	7,900	8,000	8,000	8,000	39,200
TOTAL OPERATING EXPENSES			164,300	165,600	166,400	167,100	167,800	831,200
TOTAL FIXED INVESTMENT AND OPERATING EXPENSES			236,000	180,800	181,600	182,300	183,000	963,700

1/ A proportion of this budget, to be decided upon by the Project Director, will be allocated to research and training at the Fashola sub-center.
2/ Establishment of 100 ac of permanent experimental plots spread over 5 years.
3/ Conversion of existing buildings at Mokwa and Fashola for classrooms and dormitories.
4/ Allocations for expatriate staff include base salaries plus gratuity of 10%, travel and resettlement expenses and educational allowances.
5/ Assumes appointment of two graduate counterparts for each expatriate specialist.
6/ 600 hours per year at N9 per hour for hire charge.
7/ 1,500 hours per year per tractor at N1.5 per hour for fuel, oil, grease, spare parts and repairs.
8/ 20% of cost beginning with year of acquisition.
9/ 10,000 miles per year per vehicle at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
10/ N6 per day per student for 20 students for 200 days per year.
11/ N25 per day per lecturer for 2 guest lecturers for 100 days.
12/ 5% of cost of field plots, teaching facilities and equipment and student housing.
13/ 5% of operating expenses.

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NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Heavy Equipment Unit

Investment Costs
(N)

	Project Year 1		
	Unit Cost	No. Units	Cost
FIXED INVESTMENT			
Tractors and Graders			
Crawler Tractor, 180 hp, Caterpillar D7 or equivalent 1/	52,000	3	156,000
Crawler Tractor, 140 hp, Caterpillar D6 or equivalent 2/	36,000	4	144,000
Wheel Tractors, 100-110 hp	8,000	3	24,000
Wheel Tractors, 60-65 hp	4,500	4	18,000
Motor Grader, 115 hp, Caterpillar 112 or equivalent	30,000	3	90,000
Subtotal			432,000
Vehicles			
Four-wheel-drive vehicle	4,500	7	31,500
Four-wheel-drive vehicle (Mobile Workshop)	10,000	2	20,000
Truck, 5-ton	8,000	2	16,000
Tractor Transporter	22,000	3	66,000
Subtotal			133,500
Machinery and Equipment			
Clearing Blade and Related Equipment for D7, Rome KGA7E or equivalent	3,800	3	11,400
Clearing Blade and Related Equipment for D6, Rome KGA6C or equivalent	3,000	4	12,000
Treepusher for D7, Fleco TPT7 or equivalent	5,800	1	5,800
Treepusher for D6, Fleco TPT6 or equivalent	4,600	1	4,600
Plowing Disc Harrow, Rome TRW 24-30 or equivalent	8,100	7	56,700
Pulverizing Disc Harrow, Rome TCW 40-24 or equivalent 3/	5,300	7	37,100
Root Plow, Fleco D7 or equivalent	8,100	3	24,300
Root Rake, Fleco D7 or equivalent	5,300	3	15,900
Scraper, Caterpillar D7 or equivalent	20,700	3	62,100
Cable Control, Caterpillar 127 or equivalent	5,500	3	16,500
Clearing Chain, 300 ft	3,700	2	7,400
Ripper, Caterpillar 7 or equivalent, 3 Teeth	8,100	3	24,300
Ripper, Caterpillar 6 or equivalent, 3 Teeth	6,400	3	19,200
Cab Screen and Radiator Guard for D7	3,500	3	10,500
Cab Screen and Radiator Guard for D6	2,800	4	11,200
Trailers, Heavy Duty	4,600	4	18,400
Sod Seeder, 13 Coulter, Heavy Duty	2,300	4	9,200
Fertilizer Distributor, 4-5 ton Capacity	2,300	4	9,200
Cambridge V-Roller with Seed and Fertilizer Boxes	1,400	4	5,600
Tools and Workshop Equipment			16,000
Office and Radio Communications Equipment			9,200
Spares 4/			48,000
Subtotal			434,600
Physical Contingencies 10%			99,900
TOTAL FIXED INVESTMENT			1,100,000

1/ Equipped with powershift; crankcase; trackroller and cab guards; pull-hook; lights; hydraulic controls; model 57 winch; No. 7A bulldozer.
2/ Equipped with powershift; crankcase; trackroller and cab guards; pull-hook; lights; hydraulic controls; model 56 winch; No. 6A bulldozer.
3/ Equipped with chain harrow for levelling.
4/ Based on 5% of total purchases.

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LIVESTOCK DEVELOPMENT PROJECT

Heavy Equipment Unit

Income and Operating Expenses
(N)

	Unit Cost	No. Units	Project Years 2	3	4	5	6	Total
INCOME								
Payments for Private and State Ranches participating in project			450,060	414,530	401,300	51,750	25,875	1,343,515
Payments for Pasture Establishment in Kukar-Jangarai			23,000	23,000	23,000	-	-	69,000
Payments for work undertaken on Group Ranches in Mubi Area			62,500	109,480	78,200	-	-	250,180
Payments for work undertaken for private individuals 1/			-	-	-	287,500	264,500	552,000
TOTAL INCOME			535,560	547,010	502,500	339,250	290,375	2,214,695
OPERATING EXPENSES								
Salaries and Wages 2/								
Heavy Equipment Specialist 3/	20,000 p.a.	1	20,000	20,000	20,000	20,000	20,000	100,000
Counterpart Staff 4/	5,000 p.a.	2	10,000	10,000	10,000	10,000	10,000	50,000
Accountant	5,000 p.a.	1	5,000	5,000	5,000	5,000	5,000	25,000
Plant Supervisor	4,000 p.a.	3	12,000	12,000	12,000	12,000	12,000	60,000
Secretary	3,000 p.a.	2	6,000	6,000	6,000	6,000	6,000	30,000
Foreman Mechanic	2,400 p.a.	3	7,200	7,200	7,200	7,200	7,200	36,000
Mechanic/Fitter	1,600 p.a.	6	9,600	9,600	9,600	9,600	9,600	48,000
Chief Clerk/Typist	1,600 p.a.	2	3,200	3,200	3,200	3,200	3,200	16,000
Storekeeper/Clerk	1,200 p.a.	2	2,400	2,400	2,400	2,400	2,400	12,000
Crawler Tractor and Grader Driver	1,200 p.a.	10	12,000	12,000	12,000	12,000	12,000	60,000
Wheel Tractor Driver	800 p.a.	7	5,600	5,600	5,600	5,600	5,600	28,000
Clerk	800 p.a.	4	3,200	3,200	3,200	3,200	3,200	16,000
Vehicle Driver	600 p.a.	14	8,400	8,400	8,400	8,400	8,400	42,000
Laborer	400 p.a.	10	4,000	4,000	4,000	4,000	4,000	20,000
Subtotal			108,600	108,600	108,600	108,600	108,600	543,000
Running Costs of Tractors and Vehicles								
Crawler Tractors 5/			166,000	152,000	139,000	111,000	97,000	665,000
Wheel Tractors 6/			21,000	16,800	16,800	12,600	12,600	79,800
Motor Graders 7/			18,500	15,500	15,500	12,500	12,500	74,500
Four Wheel Drive Vehicles 8/			14,050	14,050	14,050	14,050	14,050	70,250
Trucks, 5-ton 9/			3,000	3,000	3,000	3,000	3,000	15,000
Tractor Transporters 10/			3,750	3,750	3,750	3,750	3,750	18,750
Subtotal			226,300	205,100	192,100	156,900	142,900	923,300
Repairs and Maintenance								
Machinery and Equipment 11/			9,700	9,700	9,700	9,700	9,700	48,500
Subtotal			9,700	9,700	9,700	9,700	9,700	48,500
Field Allowances								
Professional Staff 12/			4,000	4,000	4,000	4,000	4,000	20,000
Non-Professional Staff 13/			24,000	24,000	24,000	24,000	24,000	120,000
Subtotal			28,000	28,000	28,000	28,000	28,000	140,000
Miscellaneous 14/			18,600	17,600	16,600	15,200	14,500	82,500
TOTAL OPERATING EXPENSES			391,200	369,000	355,000	318,400	303,700	1,737,300
NET OPERATING INCOME (Total Income - Total Expenses)			144,360	178,010	147,500	20,850	(13,325)	477,395

1/ In years 5 and 6 it is envisaged that a total of 1,250 and 1,150 days of work, respectively, will be undertaken for private ranchers by equipment from the unit.
2/ Overtime is included where appropriate in the wages of drivers and mechanics.
3/ Allocation for expatriate specialist includes base salary plus gratuity of 10%, travel and resettlement expenses, and educational allowance.
4/ Assumes appointment of two agricultural graduates to work as counterparts to the heavy equipment specialist.
5/ 3,000, 2,750, 2,500, 2,000 and 1,750 hours per Crawler per year for years 2, 3 4, 5 and 6 respectively at N 9.00 per hour per D7 Crawler and at N 7.10 per hour per D6 Crawler for fuel, oil, grease, spare parts and repairs.
6/ 2,000, 1,600, 1,600, 1,200 and 1,200 hours per Tractor per year for years 2,3 4, 5, and 6 respectively at N 1.50 for fuel, oil, grease, spare parts and repairs.
7/ 1,200, 1,000, 1,000, 800 and 800 hours per Grader per year for years 2, 3, 4, 5 and 6 respectively at N 5.15 per hour for fuel, oil, grease, spare parts and repairs.
8/ 12,000 miles per year per vehicle at N 0.13 per mile for fuel, oil, grease, spare parts, repairs and insurance.
9/ 10,000 miles per year per vehicle at N 0.15 per mile for fuel, oil, grease, spare parts, repairs and insurance.
10/ 5,000 miles per year per vehicle at N 0.25 per mile for fuel, oil, grease, spare parts, repairs and insurance.
11/ 2½% of cost beginning with year of acquisition.
12/ N 10.00 per day for two professional staff for an average of 200 days per year.
13/ N 4.00 per day for 30 non-professional staff for an average of 200 days per year.
14/ 5% of operating costs; includes administrative expenses.

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LIVESTOCK DEVELOPMENT PROJECT

Outline Terms of Reference for Consultants

A. Terms of Reference of the Technical Auditor

1. The consultant would be a senior livestock production specialist of international experience and reputation in livestock production and livestock project management in region(s) ecologically similar to Nigeria. The objective of the consultants' work would be to review the technical progress of the project and to provide technical advice and support to the Project Director and staff. To that purpose, the consultant would be expected to make two annual visits to the project of about one month each to review on the spot each of the project components. Within 45 days of each visit, the consultant would submit reports (a) to the Permanent Secretary, Federal Ministry of Agriculture and Natural Resources on the project overall, (b) to NAB on those aspects of the project that NAB finances, and (c) copies of both reports to the Bank. During the first year of the project, the consultant would assist LPU and the public ranching companies to set up systems of technical data collection and analysis for the purpose of a continuous technical monitoring of project development.

2. The work of the consultant would include, inter alia, critically evaluating and making appropriate recommendations concerning the following:

(a) performance of all components of project management,

(b) ranch and grazing reserve performance as evidenced by stocking rates, calving and weaning rates, mortality rates, rates of weight gain, culling rates, and other relevant livestock standards,

(c) formulation and application of project stocking, breeding, feeding, and pasture and forage policies,

(d) formulation and application of range management policies for the grazing reserves,

(e) planning and execution of the project training program, both local and overseas,

(f) field extension techniques and standards of technical assistance provided to private ranchers and smallholder fatteners,

(g) execution of the project research program, and

(h) execution of the program of importation and multiplication of pasture seeds and cultivars.

B. Terms of Reference of the Livestock Taxation Study

1. Nigerian cattlemen owners are subject to "Jangali" a per head of cattle tax. Jangali is very unpopular with herdsmen who employ various ruses to avoid compliance and consequently collection rates seldom exceed 50-60%. Traditional herdsmen do not differentiate between the Government extension agent and tax collectors and as a result extension agents find it difficult to gain the confidence of cattlemen. Thus, in its current form Jangali is a constraint to the development of improved animal husbandry techniques within the traditional livestock sector. On the other hand, Jangali is an important source of revenue for state and local governments and cannot be abandoned unless it is replaced by a workable alternative.

2. An experienced and qualified firm of consultants would be engaged under the project to examine alternatives to Jangali which would ultimately remove the cattle owners' distrust of Government's extension and veterinary agents but at the same time permit the collection of a reasonable level of taxation from the livestock industry.

3. Specifically, the consultants would inter alia:

(a) describe and analyze relevant local, state, and federal livestock taxes and duties emphasizing Jangali but also including:

(i) marketing taxes,

(ii) slaughter taxes,

(iii) dealers and butchers licenses, and

(iv) import taxes and duties on live animals, meat and other animal products.

(b) critically review the organization and administrative procedures of the above taxation systems paying particular attention to:

(i) collection procedures,

(ii) responsibility for tax administration,

(iii) expected and actual tax collections and factors responsible for any existing divergence, and

(iv) expected and actual cost of tax collection.

(c) evaluate the relative importance of the different forms of livestock taxes to federal, state, and local Government finances.

4. In the light of the above analysis, the consultants would propose appropriate modifications to the existing system of livestock taxation in order to achieve the objectives set out in para 2. They would propose methods to implement their proposals and would evaluate the effect of such proposal in terms of Government revenue.

5. The consultants would evaluate the merits of creating a "livestock fund" which would permit the establishment of stable relation between revenues collected from the livestock sector and the allocation of Government resources to the sector and, if necessary, specify means to finance and administer such a fund.

6. The consultants would investigate the extent to which cattlemen could be expected to pay directly for Government services such as animal health, watering facilities, etc.

Qualifications of the Study Team

7. It is envisaged that the study would require the services of a livestock specialist, experienced in livestock production under conditions similar to Nigeria, and of an economist with experience in fiscal theory and policies. Each consultant would be engaged for six months, four months would be spent in field work and two months in report writing. A report would be submitted to the Government and the Bank no later than after eight months from the start of the study in the field.

C. Preparation of a Detailed Identification Report for Development of Projects Within the Areas to be Cleared of Tsetse-fly in Nigeria

1. Internationally recruited consultants would be hired to prepare an acceptable strategy for the development of tsetse-fly eradicated land areas, mainly within the area known as the "middle belt" of Nigeria, and to identify priority areas which could form the basis of rational project development. Further consultancy services would be engaged in due course to carry out detailed project preparation. The study would proceed as follows:

(a) a survey of resources made available or due to be made available through tsetse clearance operations,

(b) the development of an agricultural strategy to take into account the production needs of the country in relationship to the land use and social constraints inherent in the areas studied, and

(c) the preparation of detailed terms of reference for the preparation of the identified projects, together with the relevant manpower requirements and estimated costs.

2. Prior to calling for consultant proposals the Government and the Bank would consult on the detailed terms of reference for the identification study.

Background

3. Over the past ten years, 34,000 square miles of tsetse infested land has been reclaimed, leaving about another 50,000 square miles to be reclaimed. These areas cover the Sudan, Sub-Sudan and Northern Guinea zones. The United Kingdom has provided technical assistance to identify areas where tsetse clearance is possible and, in addition, is making recommendations on agricultural development and land use for the areas. The North East State has been fully surveyed, and a land resource report has been published. A similar report is currently being prepared for the North Central State. Federal Government is aware of the need to properly develop these areas being cleared of tsetse, but no plans have been prepared; and, in general, current development is haphazard.

4. In the recent IBRD agricultural sector review, it was pointed out that the reclaimed areas has high potential for both crops and livestock production, and that if planned and managed properly, could make a significant contribution to Nigeria's beef and cereal supplies. The greater part of the areas which might be reclaimed lie within Benue Plateau State, Kwara State and the Southern portion of the North Eastern, North Central and North Western States.

5. Even though ODA is preparing land use maps for the areas cleared of fly, no real strategy for development has been proposed by Government, except that development should be related to the potential land use of the area. Over the last ten years, as tsetse clearing has been undertaken itinerant graziers and settlers have moved in and taken up land. If this haphazard development is allowed to continue, then large areas with high potential for various agricultural uses will be lost or, at best, be farmed at a subsistence level. The opportunity should now be taken to properly plan the areas on a regional or zonal basis, taking into consideration agricultural aspects, tenurial, social and general infrastructure requirements. The plans should lead to a phased investment program which would be developed over perhaps a twenty-or thirty-year program.

6. In brief, planning should include:

(a) Agriculture. There are various types of farming systems ranging from extensive ranching, mixed farming and arable smallholders. There is a case for the development of all these systems. Properly managed ranches would reduce some of the overstocking procedures in the North and could produce significant quantities of beef for the fast growing urban sector. Commercial mixed farming, based on one-or two-tractor units, could be considered desirable for three reasons: (i) to enable private capital gained in industry to be reinvested in the land - and there are many Nigerians with money who would welcome the opportunity to farm commercially; (ii) to provide employment for those rural people who do not want to have management responsibilities; and (iii) possibly most importantly there is a need for a commercial farming sector to involve itself in specialized production such as seed multiplication for distribution to the smallholder sector. The smallholder development could also be an important component of any zonal planning and might include intensive settlement schemes for people from the overpopulated areas of Nigeria. Other settlement schemes could be envisaged on a much more extensive and low cost basis, whereby the minimum infrastructure is presented (e.g. roads and water supplies), thereby allowing spontaneous settlement to take place.

(b) Land Tenure. Since most of the land is reclaimed land and generally empty, land rights are not bound by tradition and could be rationalized, resulting in either freehold or leasehold titles, together with all the advantages which go with the security of title.

(c) Social Services. In these large areas, social services including health, water supplies, schooling, would need to be considered and included in the overall plan; and

(d) General Infrastructure. Would include all the support, physical and administrative, services necessary to serve the people who take up business within the planned area; such services would include markets and marketing, credit, feeder and crop extraction roads, soil and water conservation, research and possibly investments for the initiation of rural industries.

7. In effect, the opportunity should now be taken to plan regional and agricultural development for the future. The planning and investments could be large, because here for the first time in Africa, South of the Sahara, is a country with a very large population (70 million), much of it under pressure, with large amounts of new land due to become available.

8. The immediate need is to assist the Nigerian Government to prepare regional or zonal development plans for the land cleared of tsetse and that to be cleared in the future. Basic planning can be carried out using the land use information being prepared by ODA, existing aerial photography and 1:50,000 topographical maps. The order of planning would be as follows:

(a) A broad survey of the area to determine: (i) the effectiveness of tsetse eradication and the degree of reinfestation; (ii) the land use; (iii) the existing infrastructure and services; and (iv) the human and livestock production;

(b) Categorizing the priority areas by potential for livestock and crop production;

(c) Preparation of a schedule of phased development based on (b) above for the cleared and the uncleared areas, taking account of potential social and economic needs of the country.

(d) Preparation of a detailed feasibility study for those priority areas for which development would be initiated during a five- or six-year period. The study would include all the proposals in para 4, and any other factor which might be pertinent to the area to be developed. Except for the inclusion of intensive irrigation schemes, detailed soil surveys would be unnecessary.

Requirements

The preparation of the identification report is expected to take about four months (inclusive of report writing). The consultant team would be made up as follows:

Team Leader	-	4 months
Land Planner	-	4 months
Agriculturalist	-	4 months
Commercial Livestock/Crop Specialist	-	4 months
Hydrologist	-	2 months
Road Engineer	-	2 months
Economist	-	2 months
Total	-	22 man months

The consultants, who would be internationally recruited, would be selected on the basis of their qualifications and experience with particular respect to:

(a) a wide range of different types of agricultural development;

(b) the preparation of large-scale planning for land use and regional development.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Project Cost Summary
(N)

	Project Year								
	1	2	3	4	5	6	7	8	Total
NELC /1									
Infrastructure and equipment	-	210,000	110,380	84,200	-	-	-	-	404,580
Breeding cattle	-	93,700	77,100	54,300	67,700	-	-	-	292,800
Incremental fattening cattle	-	70,950	179,960	113,300	77,880	-	-	-	442,090
Working capital	-	167,280	135,470	218,380	207,830	-	-	-	728,960
Subtotal	-	541,930	502,910	470,180	353,410	-	-	-	1,868,430
WLC /2									
Infrastructure and equipment	-	875,270	510,700	399,080	-	-	-	-	1,785,050
Breeding cattle	-	651,150	333,950	337,100	349,700	-	-	-	1,671,900
Incremental fattening cattle	-	591,000	22,400	451,100	-	-	-	-	1,064,500
Working capital	-	175,100	875,000	592,000	775,000	-	-	-	2,417,100
Subtotal	-	2,292,520	1,742,050	1,779,280	1,124,700	-	-	-	6,938,550
NLPC /3									
Infrastructure and equipment	-	314,300	194,800	153,800	-	-	-	-	662,900
Working capital	-	501,920	-	-	-	-	-	-	501,920
Subtotal	-	816,220	194,800	153,800	-	-	-	-	1,164,820
Private Farmers/Traders									
Infrastructure and equipment /4	-	581,400	385,200	449,000	127,600	63,800	-	-	1,607,000
Breeding cattle /4	-	126,000	249,000	510,000	565,000	290,000	169,000	-	1,909,000
Incremental fattening cattle /4	-	378,000	223,650	158,550	32,550	-	-	-	792,750
Working capital /4	-	145,080	190,800	88,580	124,860	24,180	26,600	-	600,100
Technical services /5	1,150	2,160	3,930	4,000	4,000	4,000	4,000	4,000	27,240
Subtotal	1,150	1,232,640	1,052,580	1,210,130	854,010	381,980	199,600	4,000	4,936,090
Smallholder Fatteners									
Incremental fattening cattle /6	-	88,000	77,000	165,000	330,000	165,000	-	-	825,000
Incremental feed /6	-	22,400	19,600	42,000	84,000	42,000	-	-	210,000
Technical services /5	3,450	5,180	6,560	10,070	10,650	11,800	11,800	11,800	71,310
Subtotal	3,450	115,580	103,160	217,070	424,650	218,800	11,800	11,800	1,106,310
Grazing Reserves /7									
Fulani - Infrastructure and equipment	-	204,600	358,050	255,750	-	-	-	-	818,400
Other expenses until completion of reserve	-	58,800	171,500	263,230	278,490	282,760	214,080	88,500	1,357,360
Kukar Jangarai - Infrastructure and equipment	-	101,750	70,180	70,180	-	-	-	-	242,110
- Other expenses until completion of reserve	-	10,775	23,960	35,920	47,880	47,880	-	-	166,415
Subtotal	-	375,925	623,690	625,080	326,370	330,640	214,080	88,500	2,584,285
Project Administration and Central Services									
LPU - Vehicles and Equipment /8	85,500	-	-	-	67,600	-	-	-	153,100
Salaries and wages	194,800	194,800	194,800	194,800	194,800	194,800	70,800	70,800	1,310,400
Other expenses until completion of reserve	29,600	29,600	29,600	29,600	29,600	29,600	29,600	29,600	236,800
Consultants	72,000	72,000	72,000	20,000	19,000	19,000	19,000	19,000	312,000
Seed multiplication	-	41,500	23,100	-	-	-	-	-	64,500
Overseas training	-	24,000	24,000	24,000	24,000	-	-	-	96,000
Heavy Equipment Unit /9									
Machinery and equipment	1,100,000	-	-	-	-	-	-	-	1,100,000
Working capital /10	200,000	-	-	-	-	-	-	-	200,000
Research and Training /11									
Infrastructure and equipment	-	71,700	15,200	15,200	15,200	15,200	-	-	132,500
Salaries and wages	-	105,600	105,600	105,600	105,600	105,600	-	-	528,000
Other expenses until completion of reserve	-	58,700	60,000	60,800	61,500	62,200	-	-	303,200
Subtotal	1,681,900	597,900	524,200	450,000	517,300	426,400	119,400	119,400	4,436,500
Total Project Cost Before Price Contingency	1,686,500	5,972,715	4,743,390	4,905,540	3,600,440	1,357,820	544,880	223,700	23,034,985
Price Contingency /12	101,190	705,828	809,469	1,071,704	1,052,574	508,261	224,412	131,862	4,605,300
TOTAL PROJECT COST	1,787,690	6,678,543	5,552,859	5,977,244	4,653,014	1,866,081	769,292	355,562	27,640,285

/1 Annex 6.
/2 Annex 7.
/3 Annex 8 Purchases of steers for fattening would be financed by seasonal bank overdraft. Maximum overdraft requirements would build up to some N 1,700,000 in PY 5 and 6 and would decline thereafter.
/4 Annex 9.
/5 Staff seconded by State to LPU.
/6 Annex 10.
/7 Annex 11.
/8 Annex 12.
/9 Annex 14.
/10 Estimated need to cover about 6 months operating expenses.
/11 Annex 13.
/12 6% per year from year 1-8.

December 14, 1973

NIGERIA

Livestock Development Project

Estimated Schedule of Disbursement of IBRD Loan
(US$'000)

Project Year	End of Quarter	Estimated Disbursement: Amount Disbursed	Estimated Disbursement: Balance of Loan
1	0	-	21,000
	1	300	20,700
	2	300	20,400
	3	300	20,100
	4	1,600	18,500
2	1	950	17,550
	2	1,050	16,500
	3	1,050	15,450
	4	1,100	14,350
3	1	950	13,400
	2	950	12,450
	3	950	11,500
	4	900	10,600
4	1	1,100	9,500
	2	1,100	8,400
	3	1,100	7,300
	4	1,100	6,200
5	1	800	5,400
	2	800	4,600
	3	800	3,800
	4	800	3,000
6	1	800	2,200
	2	800	1,400
	3	700	700
	4	700	-

December 14, 1973

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Terms of Reference of LPU Senior Staff

A. Qualifications and Experience, Duties and Responsibilities of the Project Manager

1. The Project Manager would be a specialist of international standing recruited to direct and coordinate the execution of the project for its first six years. He would work under the Director, Federal Livestock Department (FLD), to whom he would be administratively responsible, and with whom he would be expected to consult on a continuing basis.

2. The qualifications and experience of the Project Manager would be as follows:

(a) A university degree (or its equivalent) in Agriculture or Veterinary Science with a major in Animal Husbandry, Animal Production or an allied field.

(b) Actual experience or an indicated potential as a successful project leader able to coordinate the activities of a team of individuals working in various areas of a development program.

(c) A broad practical background in ranch development with experience in land clearing, pasture establishment and management, and cattle production, under tropical conditions.

(d) Experience in the use of credit in farm development and the ability to prepare and appraise technically and financially viable ranch development plans.

3. The duties and responsibilities of the Project Manager would be:

(a) To establish the Livestock Production Unit (LPU) within FLD and direct it on a day-to-day basis. This would include the appointment of staff, delegation of duties and responsibilities, and supervision of work programs of all LPU staff.

(b) To assist Government in the identification and selection of the two Deputy Project Managers, the internationally recruited staff and the various counterpart staff to be employed under the project.

(c) To plan, in cooperation with senior project staff, the various work programs to be undertaken, to supervise the work of all staff, and to coordinate implementation of the various project components to ensure that the execution of the project as a whole is orderly and efficient.

(d) To undertake responsibility for organizing the selection of the private ranchers and the small-holders who would participate in the private sector credit scheme.

(e) To appraise the technical and financial viability of ranch plans prepared by the Ranch Planning Specialist and his staff and recommend appropriately to the Nigerian Agricultural Bank (NAB) on technical and financial grounds.

(f) To ensure that all ranches being financed under the project are given adequate technical supervision and extension assistance and that their development proceeds in an orderly and efficient fashion.

(g) To ensure that records covering all aspects of Project implementation are adequately kept.

(h) To report to NAB as and when required by that institution concerning the progress on individual ranches being financed by NAB under the Project.

(i) To recommend to Government the names of suitable candidates for out-of-country training, to submit an appropriate course of training to be followed by successful candidates, and to arrange for the placement of the trainees in selected institutions of higher learning.

(j) To recommend to Government the names of suitable candidates to act as Consultants for carrying out studies and for the preparation of follow-up projects, to draw up terms of reference and facilitate the work of the consultants in the field.

(k) To prepare quarterly and annual reports for submission to Government and IBRD and such other documents as they may from time to time require.

B. Qualifications and Experience, Duties and Responsibilities of Other Internationally Recruited Specialists

4. Under the project, five internationally recruited technical specialists would be employed to assist the Project Manager and the counterpart staff in the execution of the Project. They would have university degrees (or equivalent qualifications) in agriculture or a related field with a background of postgraduate work and broad practical experience in the area of their specialty. In addition, three Ranch Technical Officers would be appointed to provide technical support for the public and private sector ranch development programs. They would be certificate or diploma holders in agriculture or an allied field with 8-10 years experience in ranch development and grassland cattle production under tropical conditions. Details of the job descriptions of the various posts are as given below.

I. Ranch Planning Officer

(a) Under the direction of the Project Manager, to assume responsibility for the drawing up of plans for the development of the nine publicly owned and the 50 private ranches participating in the Project, the NE grazing reserve and the Kukar-Jangarai Pasture Improvement Program. Also for drawing up the procedures to be followed by participants in the smallholders fattening scheme.

(b) In the execution of the private sector scheme, to take responsibility for coordination of the work to be carried out and of the staff involved.

(c) In the course of the above duties, to train at least two counterpart workers in the preparation of ranch development plans, budgeting, financial analysis and record keeping.

(d) The specialist would be expected to undertake such other duties as may from time to time be assigned by the Technical Director.

II. Heavy Equipment Specialist

(a) Under the direction of the Project Manager, to take responsibility for the Heavy Equipment Unit (HEU). Such responsibility would include the initial ordering of equipment, the establishment of a headquarters and field depots, and the training of professional counterparts, drivers, mechanics and associated personnel. Ongoing responsibilities would include day-to-day organization and coordination of the work of the Section, the deployment of personnel and machinery, and the servicing and maintenance of working units in the field.

(b) In the development of the work program of HEU, the specialist would be expected to keep in close liaison with the Project Manager and the Ranch Planning Officer to ensure an orderly and smooth execution of capital works called for in the overall Project plan of operation.

(c) Close contact would also be expected between the specialist and the Land Development Specialist at Mokwa to ensure the application of newer techniques of land development and pasture establishment with a minimum of delay.

(d) The specialist would be expected to undertake such other additional duties as the Project Manager may from time to time assign.

III. Livestock Production Specialist

(a) Under the direction of the Project Manager, to be responsible for the organization of the Research and Training Unit to be established at Mokwa and Fashola. As the Officer-in-Charge of the overall research and training efforts, the Specialist would be expected to coordinate the activities of the other two specialists and the six counterparts working under him and to design and execute a comprehensive and practical research program aimed at providing technical support for the pasture/animal production approach to be applied under the Project on participating ranches.

(b) The specialist with his staff would undertake responsibility for designing the advanced practical training in ranch development and beef cattle management for ranch managers, Government employees and private individuals and ensuring all aspects of its execution. Candidates entering the program would be selected by the specialist and his staff in consultation with the Project Manager.

(c) In addition to the above responsibilities, the specialist would be expected to play a major role in ensuring the success of the small holders fattening scheme. The latter will require careful supervision of the purchase, feeding, management and disposal of livestock and is expected to require the full-time services of a Ranch Technical Officer who would be assigned to the scheme to exercise day-to-day control. Overall supervision and coordination of the responsibility for the successful outcome of the undertaking, however, would be assumed by the specialist.

(d) To undertake such other duties as may from time to time be assigned by the Project Manager.

IV. Pasture Production Specialist
Land Development Specialist

(a) Under the direction of the Officer-in-Charge of the Research and Training Unit to be located at Mokwa and Fashola, the specialists would develop research programs in land development techniques, pasture establishment, and pasture and forage production and utilization. An important aspect of the work would be cooperative studies on least-cost approaches to land clearing, pasture establishment, supplementary forage production, pasture and forage utilization and related aspects of pasture/animal production under tropical conditions. Concurrently, the specialists would be expected to involve themselves in the planning and execution of the training program.

(b) Additional responsibilities of the Pasture Production Specialist would include planning and supervision of the work program of the seed multiplication unit which would be established at Bornu ranch, and undertaking which would include species and cultivar adaptability trials, fertilizer experiments, and studies on the productivity of various tropical grasses and legumes with respect to dry-matter production, seasonal distribution of production, seed set, seed harvesting, yields and such.

(c) In the course of his duties, the Land Development Specialist would be expected to work in close cooperation with the Heavy Equipment Specialist to ensure that proven techniques likely to reduce the costs and increase the effectiveness of the Heavy Equipment Section would be applied in the field with a minimum of delay.

(d) Both specialists would be expected to undertake such additional duties as the Officer-in-Charge of Research and Training or the Project Manager might from time to time assign.

V. Ranch Technical Officers

(a) Under the direction of the Project Manager, or such others as he may designate, to provide technical support and guidance to the managers of the various publicly owned ranches and the owners and managers of the private ranches participating in the Project. Also, to provide similar support and supervision to the small holders in the fattening scheme, to the various units of the group ranching scheme and the Kukar-Jangarai Pasture Improvement Program.

(b) It is anticipated that Ranch Technical Officers, as well as participating in the above roles, would be involved in the detailed planning and siting (in collaboration with the Ranch Planning

Officer and on an individual ranch basis), of houses, barns, yards, dips, fences, roads, firebreaks and such. Also, in the building or erection of such structures they would involve themselves in assisting ranch managers with procurement, organization of labor, supervision, etc.

(c) In addition to these regular duties, to undertake such other work as the Project Manager or his designate might assign.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

ANNEX 19

NAB Cash Flow from Project
(N)

	Project Year											
	2	3	4	5	6	7	8	9-14	15	16	17	18
CASH INFLOW												
Loan service receipts												
NELC	12,457	39,490	70,781	104,447	217,501	217,501	217,501	217,501	-	-	-	-
WLC	70,404	189,888	298,241	410,868	463,023	897,025	897,025	897,025				
NLPC	11,944	31,291	44,539	84,462	84,462	84,462	84,462	84,462				
Private farmers/traders	41,310	99,360	241,900	342,200	380,150	752,750	752,750	752,750	752,750	752,750	-	-
Smallholder fatteners	109,600	205,500	410,999	821,997	1,027,916	1,027,916	1,027,916	1,027,916	1,027,916	1,027,916	1,027,916	1,027,916
Sub-Total	245,715	565,529	1,066,460	1,763,974	2,173,052	2,979,654	2,979,654	2,979,654	1,780,666	1,780,666	1,027,916	1,027,916
IBRD Loan:												
Ranching Companies 1/	1,496,917	1,112,511	1,301,560	1,100,605	-	-	-	-	-	-	-	-
Private farmers/traders 2/	652,365	699,240	984,150	599,250								
Smallholder fatteners 3/	78,660	68,828	147,488	294,975	147,488	-	-	-	-	-	-	-
Sub-Total	2,227,942	1,880,579	2,433,198	1,994,830	147,488							
TOTAL CASH INFLOW	2,473,657	2,446,108	3,499,658	3,758,804	2,320,540	2,979,654	2,979,654	2,979,654	1,780,666	1,780,666	1,027,916	1,027,916
CASH OUTFLOW												
Loan disbursements												
NELC	262,255	306,873	351,897	356,853	-	-	-	-	-	-	-	-
WLC	1,482,194	1,020,635	1,260,476	1,110,620	-	-	-	-	-	-	-	-
NLPC	251,440	155,840	123,040	-	-	-	-	-	-	-	-	-
Sub-Total	1,995,889	1,483,348	1,735,413	1,467,473	-	-	-	-	-	-	-	-
Private farmers/traders	869,820	932,320	1,312,200	799,000			-	-	-	-	-	-
Smallholder fatteners	104,880	196,650	393,300	786,600	983,630	983,630	983,630	983,630	983,630	983,630	983,630	983,630
Total Disbursements	2,970,589	2,612,318	3,440,913	3,053,073	983,630	983,630	-	-	-	-	-	-
Expenses 4/	34,000	36,000	38,000	42,000	44,000	48,000	30,000	30,000	24,000	24,000	20,000	20,000
IBRD Loan Service 5/	89,670	247,511	403,885	564,401	642,060	962,684	962,684	962,684	962,684	962,684	-	-
TOTAL CASH OUTFLOW	3,094,259	2,895,829	3,882,798	3,659,474	1,669,690	1,994,314	1,976,314	1,976,314	1,970,314	1,970,314	1,003,630	1,003,630
ANNUAL BALANCE (NO LAGS)	(620,602)	(449,721)	(383,140)	99,330	650,850	985,340	1,003,340	1,003,340	(189,648)	(189,648)	24,286	24,286
Lags in Loan Service Receipts 6/	(25,000)	(32,000)	(50,000)	(69,000)	(41,000)	(81,000)	-	-	-	-	-	(298,000)
ANNUAL BALANCE (WITH LAGS)	(645,602)	(481,721)	(433,140)	30,330	609,850	904,340	1,003,340	1,003,340	(189,648)	(189,648)	24,286	322,286
CUM. BALANCE (WITH LAGS)	(645,602)	(1,127,323)	(1,560,463)	(1,530,133)	(920,283)	(15,943)	987,397	7,007,437	6,817,789	6,628,141	6,652,427	6,974,713

1/ 75% of disbursements.

2/ 75% of disbursements PY 2 - 6.

3/ 75% of incremental disbursements PY 2-6.

4/ Based on the following assumptions: - (a) fixed costs - field staff ₦10,000 p.a.;
- head quarter staff ₦23,000 p.a. PY 2-7, and ₦5,000 p.a. thereafter.

(b) variable costs and defaults 0.5% of loan service receipts.

5/ Loan N 8.6 million at 7 1/4% for a term of 16 years, including a grace period of 6 years.

6/ 10% of loan service receipts delayed to following year (i.e. average delay about 5 weeks). Figures rounded to thousands.

Decembre 14, 1973.

NIGERIA

LIVESTOCK DEVELOPMENT PROJECT

Assumptions Relating to the Economic Rate of Return

The computation of the economic rate of return is based on the following assumptions:

(a) Except for NELC's Darazo and Bornu ranch development projections, which show the actual expected development of these two ranches, the projections of the other models represent an average unit of the type to be established under the project.

(b) The project cash flow consists of the aggregation of the incremental cash flows of the different project components phased as follows:

	Project Year (PY)						
	1	2	3	4	5	6	Total
	(---------- Number ----------)						
NELC Ranches	-	2	-	-	-	-	2
WLC Ranches	-	5	-	-	-	-	5
NLPC Ranches	-	2	-	-	-	-	2
Private Ranches	-	30	10	10	-	-	50
Cattle Fattening Smallholders	-	160	140	300	600	300	1500

(c) Except for the Heavy Equipment Unit (HEU) which has an expected project life of 5 years, cash flows have been arbitrarily calculated over 20 years. Except for breeding cattle, whose incremental value has been imputed as a cash inflow in year 20 and for the scrap value of HEU equipment which has been credited to year 6, no residual value has been imputed to project assets.

(d) In the case of ongoing ranches making pre-development losses, fixed assets have been valued at nil because they have no actual earning power, nor alternative use.

(e) The input and output markets are believed to express satisfactorily the economic value of the goods and services involved in this project; it has not been deemed necessary to apply a shadow price to either labor or foreign exchange. There are no import duties or quantitative restrictions affecting the importation of cattle and therefore the internal price of cattle reflects reasonably well the conditions of supply and demand in Nigeria's cattle market.

ANNEX 20

Table 1

NIGERIA

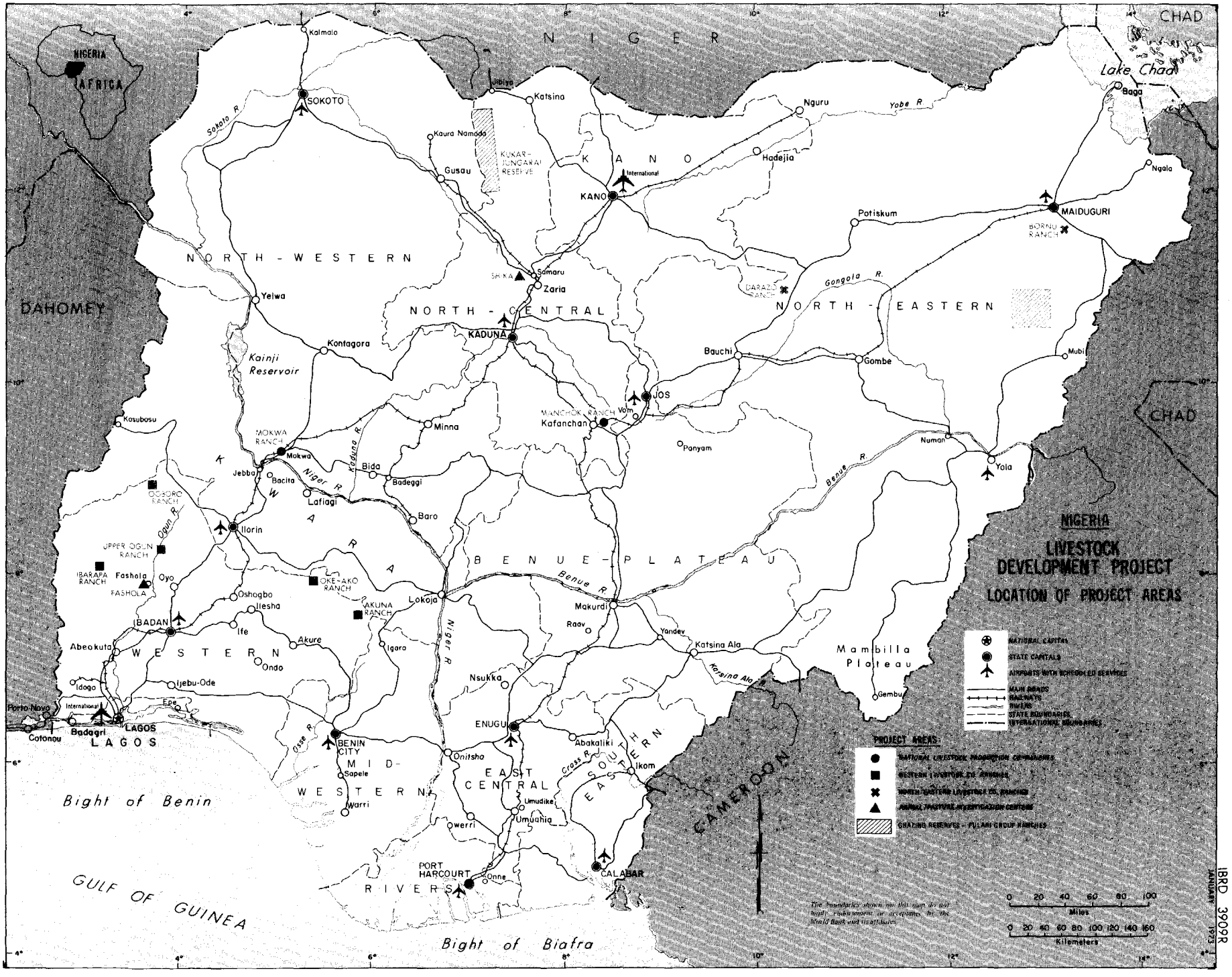
LIVESTOCK DEVELOPMENT PROJECT

Summary Rate of Return Calculation

PY	NELC	WLC	NLPC	(N) Private Farmer/Traders	Smallholder Fatteners	Heavy Equipment Unit	LPU	Total
1	-	-	-	-	-	(1,100,000)	(344,172)	(1,444,172)
2	(464,613)	(1,964,999)	(307,610)	(1,256,550)	(110,240)	144,360	(293,480)	(4,253,132)
3	(464,868)	(1,465,115)	(138,880)	(959,900)	(77,740)	178,010	(293,480)	(3,221,973)
4	(289,653)	(1,336,715)	(14,140)	(1,065,535)	(171,600)	147,500	(293,480)	(3,023,623)
5	(145,585)	(519,430)	114,700	(758,300)	(343,200)	20,850	(357,600)	(1,988,565)
6	150,615	435,910	114,700	(420,400)	(66,300)	(13,325)	(266,000)	(64,800)
7	216,430	672,500	114,700	183,700	175,500	550,000 1/	(130,000)	1,782,830
8	263,960	688,600	114,700	422,800	175,500	-	(130,000)	1,535,560
9	271,910	765,370	114,700	942,200	175,500	-	(149,700)	2,111,980
10	271,910	894,890	114,700	1,039,850	175,500	-	(149,700)	2,347,150
11	271.910	1,148,070	114,700	1,048,000	175,500	-	(149,700)	2,608,480
12	271,910	1,237,810	114,700	1,048,000	175,500	-	(149,700)	2,698,220
13	271,910	1,325,810	114,700	1,048,000	175,500	-	(149,700)	2,786,220
14	271,910	1,325,810	114,700	1,048,000	175,500	-	(149,700)	2,786,220
15	271,910	1,325,810	114,700	1,048,000	175,500	-	(149,700)	2,786,220
16	271,910	1,325,810	114,700	1,048,000	175,500	-	(149,700)	2,786,220
17	271,910	1,325,810	114,700	1,048,000	175,500	-	(149,700)	2,786,220
18	271,910	1,325,810	114,700	1,048,000	175,500	-	(149,700)	2,786,220
19	271,910	1,325,810	114,700	1,048,000	175,500	-	(149,700)	2,786,220
20	271,910	1,325,810	114,700	1,048,000	175,500	-	(149,700)	10,825,570 2/
21	1,483,190 2/	4,726,630 2/	114,700	4,475,250 2/	175,500	-	(149,700)	
Rate of Return	14%	13%	18%	13%	15%	-	-	11.0%

1/ Residual value of equipment.
2/ Includes incremental herd value.

December 14, 1973


NIGERIA
AFRICA
NIGER
CHAD
DAHOMEY
CAMEROON
Lake Chad
Bight of Benin
GULF OF GUINEA
Bight of Biafra
SOKOTO
Kalmalo
Jabiya
Katsina
Nguru
Yobe R.
Baga
Sokoto R.
Kaura Namoda
KUKAR-JUNGARAI RESERVE
Gusau
KANO
International
Hadejia
Ngala
Potiskum
MAIDUGURI
BORNU RANCH
DARAZO RANCH
Gongola R.
NORTH-WESTERN
NORTH-CENTRAL
NORTH-EASTERN
SHIKA
Samaru
Zaria
Yelwa
KADUNA
Kainji Reservoir
Kontagora
Bauchi
Gombe
Mubi
JOS
MANCHOK RANCH
Vom
Kafanchan
Minna
Ponyam
Numan
Yola
Kosubosu
MOKWA RANCH
Mokwa
Jebba
Bacita
Kaduna R.
Niger R.
Bida
Badeggi
Lafiagi
Baro
Benue R.
OGBORO RANCH
Ogun R.
Ilorin
UPPER OGUN RANCH
IBARAPA RANCH
Fashola
FASHOLA
Oyo
OKE-AKO RANCH
Oshogbo
Iiesha
AKUNA RANCH
Lokoja
Makurdi
Raav
Yandev
Katsina Ala
Mambilla Plateau
IBADAN
Ife
Akure
Igara
Abeokuta
WESTERN
Ondo
Ijebu-Ode
Idogo
Nsukka
Gembu
Porto Novo
International
Epe
Cotonou
Badagri
LAGOS
LAGOS
Osse R.
BENIN CITY
Sapele
Onitsha
ENUGU
Abakaliki
Ikom
Grass R.
MID-WESTERN
EAST CENTRAL
SOUTH EASTERN
Warri
Umudike
Umuahia
Owerri
PORT HARCOURT
Onne
CALABAR
RIVERS
NIGERIA
LIVESTOCK DEVELOPMENT PROJECT
LOCATION OF PROJECT AREAS
NATIONAL CAPITAL
STATE CAPITALS
AIRPORTS WITH BOEING 707 SERVICES
MAJOR ROADS
RAILWAYS
RIVERS
STATE BOUNDARIES
INTERNATIONAL BOUNDARIES
PROJECT AREAS
NATIONAL LIVESTOCK PRODUCTION EXPERIMENTAL
NIGERIAN LIVESTOCK DEVELOPMENT AUTHORITY
NORTH-EASTERN LIVESTOCK DEVELOPMENT
ANIMAL TRACTION INVESTIGATION CENTRE
GRAZING RESERVES - FULANI GROUP RANCHES
The boundaries shown on this map do not imply official endorsement or acceptance by the World Bank and its affiliates.
0 20 40 60 80 100
Miles
0 20 40 60 80 100 120 140 160
Kilometers
IBRD 3909R
MARCH 1973