653-0001
PD-BAN-620

A Consultant's Report

Submitted to:

The United States Agency for International Development
Yaounde, Cameroon

ASSESSMENT

POULTRY AND LIVESTOCK PRODUCTION SECTOR

EQUATORIAL GUINEA

By

Heifer Project International
Little Rock, Arkansas

January 1981

TABLE OF CONTENTS

	Page
SUMMARY	1
INTRODUCTION	3
TERMS OF REFERENCE	3
POULTRY DEVELOPMENT PROGRAM REVIEW	4
Background	4
Methodology and Results	5
Recommendations and Modifications	15
LIVESTOCK SECTOR ASSESSMENT	20
Introduction	20
Current Situation	20
Recommendations	22

APPENDIX

Appendix I.	Terms of Reference
Appendix II.	Basile Poultry Farm
	Facility Description
	Schedule for Refurbishment
	Equipment List
Appendix III.	Poultry and Egg Production System - CEPAB
Appendix IV.	Position Description
Appendix V.	Training Component
Appendix VI.	Management Services Contract

SUMMARY

This report is the result of a six-day, on-site consultancy in the island of Bioko, Equatorial Guinea, conducted by a two-person team from Heifer Project International under agreement with USAID/Yaounde. The primary objective of the consultancy was to provide a critical review of a proposed poultry development program. A secondary objective included a quick assessment of the livestock sector and its potential for development.

The major modifications to the poultry program recommended by the HPI team include:

- Phasing of the project - A two-year Phase I will provide management and technical services and equipment necessary to efficiently operate the Basile Poultry Farm. It will also develop poultry production systems appropriate for small producers and determine the overall feasibility and scope of poultry production by small producers. Phase II, funded under a separate grant, will implement small producer poultry production to the extent determined by Phase I.
- Reduce financial allocation to the poultry program to $300,000 - 350,000 and increase allocation to the provision of transportation to cocoa cooperatives.
- Delete the rabbit production component.
- The training activity should concentrate on the Basile Farm's personnel, extension agents and producers participating in the pilot program.
- The scope of work must allow for close collaboration between the Basile Farm and the crops division of the Ministry in determining the feasibility of corn production by small producers.
- Implementation of the project should be under a Management and Technical Services Contract rather than through an OPG.

3X

Funding of Phase I of the poultry production program (as proposed in this report) is recommended as a first logical step in the reconstruction of the food production process. Phase I will increase the annual supply of poultry meat and eggs by about 8 metric tons of meat and 1.3 million eggs. The recommendation to limit the scope of the program to the Basile Farm and to a small number of pilot tests with small producers is based on the present and near future unavailability of locally produced feed. The Basile Farm can operate effectively for some time on imported feed only after the infusion of the proposed management, technical services and equipment.

Practically all livestock in the island of Bioko was slaughtered during the Macias regime (1969-1978). The severe shortage of professional and skilled personnel, caused by the population exodus during the 70s, compounded with the lack of capital have prevented the initiation of any significant livestock repopulation programs by the present Government.

Relatively large areas in the higher altitudes of the island present a tremendous potential for cattle, hair sheep and goat production because of mild climate, absence tsetse fly infestation and abundant pasturelands. Areas of immediate assistance include: (1) planning and technical services to the Livestock Division of the Ministry of Agriculture; (2) overseas and local training of agricultural personnel; and (3) technical and financial assistance to the experiment stations for inititation of programs in feed and forage production.

4

INTRODUCTION

At the request of USAID/Yaounde, Heifer Project International (HPI) agreed to provide the services of two specialists in animal agriculture development to assist the Mission in determining its course of action in providing immediate assistance to the animal protein production sector in the island of Bioko of Equatorial Guinea. For this purpose, a visit was made to Equatorial Guinea from November 6 to November 12, 1980, for field observations and from November 12 to November 17 to Yaounde, Cameroon, for consultation and report preparation. Two AID/Yaounde program officers provided tactical support to the HPI team while in Equatorial Guinea. The views and recommendations of the HPI team are presented in this report.

TERMS OF REFERENCE

The initial terms of reference for the consultancy, as indicated in cable traffic between AID/Yaounde and HPI/Winrock International (Appendix I), included:

- Assessment of the livestock sector.
- Identification of constraints.
- Formulation of strategies for development.
- Review of a proposed poultry program.

Once in the field, a review of priorities revealed a previous commitment by AID to assist the Ministry of Agriculture (MOA) in the immediate development of a poultry production program. Time and logistic limitations dictated that emphasis be placed on finalizing the poultry project. Thus, less than optimum attention given to the rest of the livestock sector. This report discusses the terms of reference listed above in two major sections -- poultry development program and livestock sector assessment.

5

POULTRY DEVELOPMENT PROGRAM

Background

Several months prior to AID's request for this technical consultancy, various AID officers visited Equatorial Guinea to discuss with government officials possible areas of assistance to the country's reconstruction efforts. In the course of those visits, two areas of need were identified: (1) the critical need of small producer cocoa cooperatives for trucks to transport the crop from the field to the drying facilities and subsequently to the export facilities; and (2) the need to increase the supply of high quality protein to the population through the expansion of the poultry sector. A project paper detailing these two areas of assistance was prepared by AID/Yaounde and was presented to the HPI team upon arrival in Malabo as a working document.

The project paper consisted of two independent activities with a common goal -- to improve the socio-economic well-being of small producers. The first activity was to provide trucks to the cocoa cooperatives. Approximately $400,000 were allocated to this activity. The second activity proposed to refurbish a MOA poultry farm in the village of Basile with the short-term objective of increasing the supply of meat and eggs and, in the longer-term, to serve as a distribution center for improved stock and technology to small producers. Some $600,000 were budgeted for the poultry program.

In view of the substantial allocation of funds (60% of the available grant) to the poultry program, the primary assignment of the HPI team was to undertake a critical review of the poultry project in collaboration with AID and MOA personnel. The methodology, results and recommendations of the review are presented below.

6X

Methodology and Results of Project Review

The approach used in reviewing the poultry project included:

- Preliminary review of the project paper.
- Visits to the Basile poultry farm.
- Visits to small producer cooperatives and interviews with cooperative leaders and members.
- Interviews with Ministry of Agriculture officials.
- Discussions with AID/Yaounde project officers and Mission director.
- Recommendations and modification of project paper.

A discussion of the results of the review process for each of the activities listed above is summarized below.

Preliminary Review of the Project Paper

The first step in the review process was to become familiar with the project components and philosophy. Initial reactions of the HPI team to the project paper included:

- A well written, comprehensive proposal that met all guidelines of an operational project grant (OPG).
- Technical concerns:
  - Absolute dependence on very high priced, unreliable, imported feed.
  - Unclear mechanisms for transition of the Basile farm from a meat and egg production and to a center for distribution of improved stock (birds) to small farmers.
  - Assumed interest and participation of small producers in poultry production.
  - Assumed participation of PVOs in project implementation.
  - Unclear autonomy of the Basile farm.

Visits to Basile Poultry Farm

The Basile Poultry Farm is located 10 km outside of Malabo in the village of Basile. No climatological data were readily available for Basile, but the several hundred feet higher elevation of the area is responsible for a somewhat milder climate than Malabo's, which has an equatorial, sea level climate. Climate is expected to have some adverse effect on productivity, particularly during warmer, more humid days; however, it is not considered to be a critical constraint to production. Reportedly, intensive poultry production at the farm was quite successful during the 1960s under Spanish ownership and management. This farm and a nearby annex had a capacity of 35,000 birds. During the late 1960s the Spanish owner left the country and in the early 1970s the farm was abandoned because of the political strife brought about by the Macias government. The farm has now been operated for over one year by the Ministry of Agriculture's Livestock Division.

The Basile Farm had a population of 5,350 birds (White Leghorn) at the time of the team's visit. Of these, about 500 were mature layers, 850 were starting to lay and 4,000 were growing hens approximately four months old. Egg production averaged some 800 eggs daily or close to 60% laying rate. The estimated death loss of the laying flock approached 50% for the 10-month laying period; this is considered extremely high, particularly since there was no evidence of contagious diseases. The laying flock was distributed in two houses. The birds were in growing cages most of which were in disrepair. The growing birds were housed on the floor in a large poultry house and in the first-floor apartment of the farm house.

Several visits were made by the team to the Basile Poultry Farm for the purpose of determining: (1) assistance needed in refurbishing the facilities; (2) constraints affecting production; and (3) a suggested plan for increased production. A general layout and description of the facilities, a priority schedule for refurbishment, a production plan and an equipment list were prepared on-site and finalized in Yaounde. These

8x

write-ups appear in Appendix II of this report with only minor editorial changes.

Although much has been done in the past several months to clean-up, repair and refurbish the Basile Farm, a variety of personnel, financial and technical constraints are limiting productivity. Most of these constraints can be overcome in the short term only through the infusion of outside capital, technology and management skills.

The outstanding problems related to personnel include: (1) the lack of individuals with sufficient skills to plan, manage and operate the farm as a productive business and to train the farm's personnel; and (2) the lack of support services in the country (such as veternarians and extension agents) to support and backstop the production process.

The financial problems are due to a combination of factors prevailing at the time of the team's visit. First, only 25% of the flock were laying with a lower than optimum laying rate. The remaining 75% of the flock consisted of growing (not yet productive) birds that required large monthly expenditures in feed. Monthly sales of eggs amounted to approximately $4,300 while the monthly cost of feed alone exceeded $7,500. Once the growing birds begin laying, the situation will improve considerably. Monthly revenues should then be close to $16,000 of which 50% or more will be spent on feed. Some $8,000 will be left over each month for operating expenses, import replacements, grow-out replacement birds, repay previous losses and for other direct and indirect recurrent costs. It is felt that the total of these costs will exceed the available $8,000. Even with MOA's proposed increase in the price of eggs (from 17.9 to 35.8 cents each egg) the farm will not be able to generate sufficient funds to purchase the necessary equipment and vehicles, carry out repairs, hire competent management and train personnel (cash flows are presented in Appendix III). Infusion of outside capital is therefore required for the above expenditures if the farm is ever to become a productive, viable economic unit.

9

A second major constraint is the lack of financial autonomy of the farm. Currently, revenues from the sale of eggs go directly into the government's general fund. The release of funds to cover the farm's operating expenses is a difficult and laborious task. Too often, productivity is drastically reduced because of delayed release of funds for essential items such as feed, medicines or fuel. Direct control of budget allocations and revenues by the farm manager is a prerequisite for effective management and optimum productivity.

The most critical technical constraints to poultry production on Bioko are the total dependency on imported feed and the absence of disease prevention/control programs. Presently, no feed grains are grown in Bioko or the mainland. Protein supplements such as fish meal, soybean meal, low-gossypol cottonseed meal or groundnut meal are not available on the island. Facilities and equipment to process and/or mix feed are non-existent. Consequently, feed must be imported as completely mixed rations if successful poultry production is to occur even at the small producer level.

Problems associated with importing already mixed feed include high cost, unreliable quality and transportation difficulties. The present cost of importing feed into Bioko from the Canary Islands is $500 per metric ton. This is 2.5 times the cost of feed in the USA and approximately 1.7 times the cost of importing the ingredients and mixing the rations at the Basile Farm. This high cost results in considerable increases in the cost of production of eggs and poultry meat, which must be passed on to the consumer. Often, the use of inferior quality ingredients or old feed can reduce productivity and revenues to the point where prices for the product must be increased to avoid losses. Finally, timely supply of feed is critical. Delays in feed delivery due to unreliable transportation can be disastrous to poultry production. The Basile Farm has experienced feed supply problems regularly. During the team's first visit to the farm the birds were being fed at only 40% of maintenance requirements because of low feed stocks. A later visit revealed that the birds had received no feed for two days.

10x

To date, the farm has been fortunate in that no major outbreaks of disease have occurred. The 10 years of abandonment probably contributed to the erradication of diseases that might have been present in the premises. However, the importation of chicks and the increased number of visitors are potential sources of highly infectious diseases. This situation is compounded by: (1) the lack of stocks of medicines and vaccines and veterinary equipment; (2) the large number of rats within the facilities; and (3) in some instances, the overcrowding of birds (e.g., growing birds in the farm house). Frequent underfeeding not only lowers productivity but also reduces the bird's resistance to disease; while disease, itself, reduces productivity.

Expert assistance is critically needed to develop sanitation programs appropriate to the production system and the environmental conditions. This assistance must come from the outside as there are no local veterinarians available to the project.

Visits to Small Producer Cooperatives/Villages

A total of seven cooperatives and/or villages (Musola, Moka, Basoso, Bao Grande, Basakato del Este and Basile) were visited by the HPI team. Lengthy interviews with cooperative leaders and small producer members and non-members were held at three cooperatives. Only brief drive-through visits were made to the other four cooperatives/villages because the leaders could not be located. The objectives of these visits and interviews were to: (1) observe the general socio-economic conditions of the small producer; (2) identify, as much as possible, the extent and importance of livestock production; and (3) determine past experience, current interest and potential for poultry production. Each of the objectives is discussed briefly.

General Socio-economic Conditions - The devastating effect of ten consecutive years of political and economic strife was evident everywhere the team visited. Although much has been done in the past year to

11

reconstruct the country socially and physically, the signs of abandonment and "ghost town appearance" still persist. The sturdy construction of houses and well built roads prevented a total collapse of all infrastructure in the island of Bioko. Housing conditions are quite good (when compared to many African village standards) even though most dwellings are in need of repairs. Piped-in water supplies to central locations were inoperative in at least two villages. Unavailability of raw materials (e.g., cement, pipe, roofing material, etc.) and capital are the primary constraints to restoration of villages. Self-help community rebuilding programs are probably best suited under this conditions provided credit and materials are made available.

The present population of small producers in the country is unknown. FAO reports a 1970 total population of 291,000, of which 80% was engaged in agriculture. Some officials estimate that a population reduction of 40 to 60% might have taken place during the Macias regime (1969-1978). Current population estimates for Bioko range from 25,000 to 35,000 with 10,000 to 15,000 of these residing in Malabo and immediate areas. The remaining 15,000 to 20,000 persons are considered rural (mostly small producers and agricultural laborers).

A large percentage of small producers in the lower altitudes of the island are cocoa farmers cultivating from one to ten hectares of land. In the higher altitudes, potatoes and vegetables are grown by small farmers. The most common problem identified by the producers during the informal interviews was the lack of means of transportation for the crops from the field and to the market. Reportedly, up to 60% or more of the cocoa crop is being left on the trees to rot because of lack of transportation. This problem is compounded by the shortage of labor which resulted from the exodus of nationals and a large number of Nigerian laborers during the mid and late 1970s. Also, the repair of cocoa drying facilities in most locations has been a slow process. These and other related factors made it impossible for the team to estimate the income levels of the producers. Obviously, the producers

12x

are losing more than one-half of their potential income due to the lack of transportation for their crop.

In Malabo and in the villages visited consumer goods and foodstuffs were in short supply, but shops and markets were beginning to reopen. This and other signs of renewed economic activity are good indicators of the desire of the people and the government to create an atmosphere conducive to economic and social growth.

Symptoms of gross malnutrition and disease were not readily evident in the population in spite of food shortages and practically non-existent health services. Revitalization of the food production process, itself, at least to 1968 production levels is of utmost importance in order to prevent critical food shortages for the rural and urban poor as large numbers of nationals and others return to the country. This task requires reintroduction of crop seeds, fertilizers, pesticides, livestock and credit programs. Technology and extension services are also needed to assist and backstop the producer in revitalizing the food production sector.

Importance of Livestock to the Small Producers - The numbers of livestock reported by FAO for the years 1970 and 1979 are shown in Table 1. Ownership of these livestock prior to the Macias regime (1970) was difficult for the team to determine. It was reported, however, that small producers located in the lower altitudes kept poultry and pigs and some kept sheep (hair sheep) and a few goats. Those in higher altitudes kept cattle in addition to pigs, chickens, goats and sheep. The extent to which livestock contributed to the individual family income and well-being could not be determined either. Nonetheless, it is assumed that livestock, small stock in particular, represented an important source of high-quality protein food (meat, eggs and milk) and additional income to the farm family even though the 1970 livestock numbers are not considered especially high on a per capita basis.

Table 1. Livestock Population: Equatorial Guinea

Livestock	1970	1979
Cattle	3,000	4,000
Pigs	6,000	8,000
Sheep	28,000	34,000
Goats	6,000	8,000
Chickens	75,000	85,000
Ducks	26,000	27,000

Source: FAO Production Yearbook, Vol. 33, 1980. Rome

During the Macias rule practically all livestock in Bioko was slaughtered. FAO statistics for 1979 (Table 1) do not reflect this reduction since they are based on projections calculated from the last census which was probably reported during the 60s. The HPI team observed only a handful of backyard-type chickens in each village visited, five hair sheep in the Moka area and one pig in Malabo. The horticultural cooperative in Moka milked some 40 cows in the late 60s. Manure was used as fertilizer for potato and vegetable cultivation. Oxen served as draft animals for plowing and cartage. The cooperative has no cattle now and the facilities are surrounded by overgrowth. A small, intensive poultry production unit in the same village failed soon after the Spanish owner left.

Many of the small producers interviewed in these villages (particularly those that had owned livestock in the past) expressed the desire to keep livestock. The Moka villagers were quite interested in cattle as milk was important in their diets and draft power and manure were part of the cropping system.

Producer Interest and Potential for Poultry Production - Poultry products (meat and eggs) are presently the only sources of high-quality, animal protein available to the population in general. Condensed, canned milk is imported from time to time but it is expensive. Small

14x

producers in villages have begun to keep poultry again and the number of birds is beginning to increase slowly. The few eggs that are available in the villages sell for 50 ekueles (about $0.36) each and a live chicken costs from 900 to 1800 ekueles ($6.43 to 12.86) depending on size and location. In contrast, eggs from the Basile Poultry farm are sold for 25 ekueles in Malabo. Most of these eggs, however, find their way to the open market for 125 ekueles ($0.89) each. The relatively high cost of these products is indicative of a strong demand and a short supply.

The poultry production system used by the local small producer is the typical, backyard, extensive system practiced in most developing situations. The birds are allowed to roam freely in search of food, which consists primarily of insects, seeds and human food residues. This system requires low inputs but it yields low outputs. Low productivity per bird and high offspring mortality are common. Increased productivity would require improvements in management, nutrition, sanitation and genetic potential.

Given the current constraints -- lack of locally produced feed and the absence of veterinary/extension service support -- it is unlikely that any significant improvements can be made to the traditional system. Introduction of more productive genetic stock, alone, has repeatedly been shown to be a failure in most developing situations. It is the team's opinion, therefore, that more intensive poultry production is not feasible at the small producer level within the next two to three years. Until there is tangible evidence of the country's capability to grow and allocate feedgrains (e.g., corn) to intensive poultry production, the traditional system is best suited and should be encouraged.

The social implications of growing corn and intensifying poultry production at the small producer level need further assessment. Producer acceptance and interest in corn production under current and near future

conditions were not evident to the team during the short visit. Although MOA officials and some producers stressed the fact that corn was grown in the past in several communities, a minimum of three to five years of concerted efforts to reintroduce the crop are required before the potential for production can be objectively determined. The present labor shortage can be a serious constraint to both corn production and poultry production for small producers. It is likely that intensification of poultry production will rely heavily on women's labor. This would present an opportunity for women to earn income but would increase their workload by several hours per week (probably 5 to 7 hours for operations of 50 birds).

The proposed assistance of $500,000 by international organizations for the development of a local feed production industry will be a first positive step in determining the viability of intensified poultry production at the small farmer level. Refurbishment of the Basile Poultry Farm can also play a crucial role in the development of small scale feed production. In collaboration with the crop production division of the Ministry, tests can be conducted on the feasibility of growing corn at various locations. A starting point can be the proposed 30 hectares allocated in the mainland (Rio Muni) to grow corn by the crops division of MOA. Incentives in the form of seed, fertilizer and a fair market for the product can be initiated by MOA with key small producers to stimulate small scale corn production in suitable areas. Processing of the local corn (grinding and mixing with imported protein supplements and premixes) can be handled by the equipment proposed for the Basile farm in sufficient quantities to meet the needs of the Basile Farm and a limited number of nearby producers.

Interviews with Ministry of Agriculture Officials

The Ministry is organized into three divisions -- crops, livestock and fisheries and forestry. The livestock division consists of a director,

an assistant to the director and a small staff. Three extension agents will join the division upon their return from a short-term training course in Spain. Several meetings were held with the director of the livestock division to discuss the poultry program. A farewell lunch attended by the minister and the director of each division provided an opportunity to exchange views on the overall program. The HPI team's impressions from these meetings and discussions include:

- Ministry officials welcomed a U.S. presence in the country and encouraged a broader participation in the country's reconstruction efforts.

- The Ministry supports AID's proposed project activities -- provision of trucks and refurbishing of the Basile Poultry Farm. However, due to limited financial, technical and personnel resources, the project cannot and should not expect full mobilization of the Ministry's limited resources to backstop the implementation phase of the project.

- The livestock division prefers that the U.S.-based agency implementing the poultry project specializes in livestock production and has sufficient technical resources and expertise to backstop the on-site advisor. The division expects a close working relationship with the implementing agency to the extent that provision of advisory services on the development of a long-term national poultry (and possibly other livestock) program can be anticipated.

Recommendations and Modifications of Project Paper

The on-site consultancy unfolded a series of conclusions and recommendations which were presented to the AID/Yaounde project team for consideration in the modification of the project paper. These recommendations are briefly discussed in this section.

The HPI team agrees that there is a critical need to assist small producers in Equatorial Guinea in the proposed project areas -- provision of transportation for their crops and assistance in the development of poultry production. In view of existing conditions in the country and the constraints to intensifying poultry production at the small producer level, the HPI team recommends that the major thrust of the project be the provision of transportation to small producer cooperatives rather than the development of the poultry sector. This change in focus will meet a more pressing need and will result in an immediate and significantly greater impact on the income earning potential of a larger population of small producers.

The poultry production activity should be reduced in scope and be implemented in two phases. The HPI team recommends an initial two-year phase (Phase I) that concentrates on the refurbishment and efficient operation of the Basile Poultry Farm and that would allow sufficient time to objectively analyze, test and develop the mechanisms for intensifying poultry production at the small producer level. Phase II, under a separate grant, would implement training and poultry production at the small producer level if the results of Phase I are encouraging.

More specifically, the HPI team recommends that the poultry development activity of the project paper include the following modifications.

- Reduce the life of the project from four to two years and title it Poultry Development Program: Phase I -- Planning, Management and Technical Assistance Services. Phase I objectives are to: (1) refurbish the Basile Poultry Farm through the provision of sound management, technical expertise, training of personnel at all levels of production and management and the provision of equipment and supplies necessary for efficient operation; (2) determine small producer interest and constraints to poultry production; (3) determine viability of small-scale corn production by small farmers; (4) develop and

IPA

test production systems suitable to small producer conditions; and (4) develop a plan for implementation of a poultry production program at the small producer level (Phase II).

- Reduce financial allocation to $300,000 - 350,000. This provides for: the on-site services of an advisor (poultry specialist) for two years, four person-months equivalent in consultants, equipment and vehicles listed in Appendix II, vehicle operating expenses, relocation costs for the advisor, travel and per diem for consultants and six months supply of feed for the Basile Farm. All operating costs for the Basile Farm, including the provision of housing for the advisor, are the responsibility of MOA.

- Delete the rabbit production component from the project. Rabbit production requires specialized knowledge, skills and technology. Addition of these qualifications to the already stringent position description for the poultry specialist (Appendix IV) would make it practically impossible to recruit someone for the post. The cost of additional equipment and facilities for this component is not warranted until producer interest, market acceptance and the technical requirements are determined.

- Include a component that will determine overall small producer interest in poultry production and identify constraints. This can be in the form of visits to small producer cooperatives and the execution of a comprehensive survey on poultry production. The three extension agents assigned to the livestock division can carry out the survey under the guidance of the advisor to the Basile Farm.

- The scope of work should include close collaboration with the crops division of MOA to determine the feasibility of corn production by small producers in high potential areas.

- Delete the wide participation of small producers in Phase I of the project. Substitute with a pilot program to develop and test small-scale, intensive poultry production systems (e.g., 25-50 broilers and/or 20-30 laying hens) suitable to small producer conditions. These systems can be developed at the Basile Farm during the first year of the project. During the second year, three or four villages with high potential for poultry production can be identified, small producers trained and the systems tested. Continuous training, assistance and follow-up must be provided throughout the testing period.

- The training activity should be scaled down to include only the Basile Farm's personnel, extension agents and producers participating in the pilot program (Appendix V). Priority should be given during the first year to training of the Farm's personnel.

- The project must insist on financial autonomy of the Basile Farm. The autonomy can be on the lines discussed with the AID project team; that is, the institution of a board of directors and the assignment of a counterpart to the expatriate advisor as a manager of the overall poultry program. The farm, itself, would have a farm manager in charge of the day-to-day operations with the guidance of the advisor. The program would be directly responsible and accountable to MOA for all income and expenditures duly corroborated by official or independent accountants. The Basile Farm must have the financial authority to contract well in advance for the timely importation of feed.

- Implementation of the poultry project should be conducted under a Management and Technical Services Contract rather than through an OPG (Appendix VI). AID/Yaounde would contract directly with an appropriate organization for the proposed

20

personnel services only. Procurement of all materials, equipment and vehicles (including the trucks for the cooperatives) would be handled by AID/Yaounde. Since the requirement for calling on bids for contracts in this project has been waivered, no lengthy delays prior to project implementation are foreseen.

The recommendation to limit the scope of the proposed poultry production activity to the Basile Farm and a small number of pilot tests with small producers is based on the present unavailability of locally produced feed. Importation and subsequent distribution of very high priced mixed-feed to small producers is next to impossible under existing infrastructure and economic conditions. The Basile Farm, however, will be able to operate successfully for some time on imported feed only if the proposed management, technical and equipment inputs are provided from external sources.

Furthermore, the estimated yearly output of about 8 metric tons of poultry meat and 1.3 million eggs from the Basile Farm will be a first step in alleviating the shortage of high-protein food in Bioko although this supply amounts to only 3.5 eggs and slightly less than one ounce of meat per month for each inhabitant in the island. The alternative of direct importation of poultry meat (frozen) and eggs is not viable as a shorter-term solution because of the total absence of cold storage facilities and means of distribution.

The HPI team recommends funding of Phase I of the poultry production program as a first logical step in the reconstruction of the food production process. Phase I will not only increase the supply of meat and eggs to the population, but will determine the extent to which poultry production can be developed at the small producer level.

LIVESTOCK SECTOR ASSESSMENT

Introduction

Reassignment of priorities after the HPI's team arrival in Malabo and time constraints prevented a close look at the livestock sector (other than poultry). Nonetheless, some observations and recommendations are presented in this section with the hope that future AID assistance programs to Equatorial Guinea seriously consider expansion to the overall livestock sector.

Current Situation

As mentioned in an earlier section, practically all livestock in the island of Bioko was slaughtered during the Macias regime. Currently, there are no cattle, sheep, goats or pigs in the hands of small producers. The numbers of livestock held by small producers before 1970 could not be determined by the team. It is assumed however that of the small stock reported for 1970 (6,000 pigs, 28,000 sheep, 6,000 goats and 26,000 ducks) most were held by small producers. It is likely that the cattle sector (6,000 head) was dominated by the Spanish.

Recently FAO provided the Government with 630 head of Zebu cattle to start a repopulation program. Details on this project were not readily available to the team. A Spanish rancher in the area of Moka has imported several hundred head of cattle to start a ranching operation. Some 10,000 Ha of land have reportedly been made available to him by the Government. These were the only two projects in livestock identified by the team.

The island of Bioko presents an unique opportunity for livestock production, particularly at the higher elevations. Above 3,000 - 4,000 feet elevation in the Moka region the climate is mild and rainfall is plentiful (2,000 - 3,000 mm) throughout most of the year. The human population pressure is low and there is abundant, lush native pasture

22x

suitable for cattle grazing. At this elevation, trypanosomiasis caused by the tse-tse fly does not appear to be a problem. The Spanish rancher reported no evidence of other diseases or problems affecting his imported cattle. This higher elevation areas are also suitable for grazing hair sheep and goats. Poultry and pig production show a tremendous potential if feed grains and agricultural by-products were available.

Sea level and lower altitude areas present a much harsher environment, the likely possibility of tse-tse fly infestation and most of the land is planted with cacao trees. These conditions severely limit ruminant livestock (cattle, sheep and goats) production. Poultry, pigs and, to a lesser extent, trypanotolerant sheep and goats have a fair potential for production in these areas.

The primary constraints to the development of the livestock sector in the short-term in Bioko include:

- Financial and technical personnel constraints within the Ministry of Agriculture will limit the effectiveness of the Livestock Division to plan and implement livestock development programs that will have a significant impact on the country as a whole.
- Support and backstopping of any livestock project will be seriously hampered by the acute shortage of professional and skilled personnel in the country.
- Unavailability of locally grown feedgrains will seriously constrain poultry and pig production.
- There is a total lack of institutions to provide any training in agriculture or animal production.
- Transportation for people or agricultural products is non-existent.
- Veterinary and other supplies necessary for livestock production are not available.
- There is little or no genetic material available in the island to initiate development programs.

Recommendations

Development of the livestock sector in Equatorial Guinea can be expected to be a slow process. There is a good potential for production but the infrastructure, capital and mechanisms for development are limiting. The HPI team identified several areas within the livestock sector in need of immediate attention that can only be provided from external sources. Two of these areas are summarized below.

Short and Long Term Planning for the Livestock Sector

The present Government is faced with a critical shortage of administrators and professionals experienced in planning at a national level. The Livestock Division of MOA is no exception. The Division director, a very capable and determined person, does not have access to expert personnel to assist him in the planning and development of strategies and policies that will bring about a rational and gradual development of the livestock sector within existing and foreseen conditions.

To this effect, the HPI team recommends that planning and technical assistance services be provided to the Livestock Division of MOA. The proposed assistance will be in the form of services rendered by a two-person team (a livestock production specialist and a livestock production economist) for a period of six months (one scientific person year). Approximately three months will be spent on-site gathering the necessary data and three months at headquarters analyzing the data and drafting the reports. The outcome of the assistance can include:

- An inventory of feed, livestock, human and other resources necessary for livestock production.
- An estimation of current and projected supply and demand for livestock products.
- A series of budgets for livestock production at the small producer level.

24X

- Estimates of capital and other inputs required to meet 50, 75 and 100% of the demand for each livestock product on short and long term basis.
- Identification and development of immediate action programs that will stimulate livestock production.
- A short and long term livestock production plan (for each species) that will assist decision makers in delineating a sound and objective policy toward improvement of livestock production.

The estimated cost of the assistance is $126,888. This includes:

Salaries	$ 40,000
Fringes (18%)	7,200
International travel (4 trips)	10,000
Internal travel	3,000
Per diem (3 months x 2 persons)	16,560
Computer services	7,500
Materials and supplies	2,000
Overhead (50% of salaries & fringes)	23,600
Administration (10%)	10,986
Contingency (5%)	6,042
TOTAL	$126,888

This kind of planning assistance should be extended to the Crops Division of MOA so that an integrated plan is available to policy makers for the development of the food production process. It is expected that the number of international organizations and private and voluntary organizations offering assistance will increase rapidly within the next two years (already UNDP, EEC, the Spanish Government and others are implementing programs). The availability of such development plan would assist the Government and international organizations in selecting areas of concentration of efforts. Also it would prevent duplication of efforts, which is so often found in developing situations.

Overseas and Local Training in Agriculture

The exodus of technicians and professionals during the 70s left a tremendous vaccum in the country. Although some are expected to return, there is an urgent need to develop a skilled cadre of technicians and instructors to provide services to MOA and the agricultural sector and to initiate the training and educational process. The HPI team recommends that consideration be given to: (1) the provision of financial support for training a cadre of agricultural technicians and instructors overseas; and (2) directly assisting the revitalization process of local training institutions.

It is recommended that, as a first step, a short-term analysis be conducted to: (1) determine the present status of training efforts in the country; (2) identify the pressing needs and constraints; (3) determine the scope of the training required; and (4) prepare a project paper for implementation.

Technical and Financial Assistance to Experimental Stations

There are five agricultural experiment stations in the country, of which four can be used for pasture/feed production testing and livestock testing/multiplication. The lack of technical skills and capital in the country has delayed effective utilization of these resources. Pasture and feed resources development is urgently needed if the livestock and poultry industry is to be rehabilitated and expanded. A short-term consultancy is suggested to determine, in detail, the approach and magnitude of the assistance required.

APPENDIX I

TERMS OF REFERENCE

ORRILTON, ARKANSAS
10 555 3211
TT GA 978 6223 KN
INROCK MRLT

0 14 1602

MEMBYA 6223KN
A

INROCK MRLT
ORRILTON, ARKANSAS
CTOBER 14, 1980

AOUNDE, CAMEROON
TTN# R. GOLDMAN

TA SCHMIDT/MARTINEZ MALABO L6#25 HRS. OCT. 28 IBERIA 969.

S PER OUR PHONE CONVERSATION OCT. 10 PURPOSE TRIP IS TO
A) ASSESS LIVESTOCK PRODUCTION SECTOR (B) IDENTIFY CONSTRAINTS
C) FORMULATE STRATEGIES FOR DEVELOPMENT AND (D) REVIEW PROPOSED
OULTRY PROGRAM. TRIP WILL BE LIMITED TO ISLAND BIOKO FOR ABOUT
EVEN DAYS. REMAINING WEEK TO BE SPENT AID/YAOUNDE FINALIZING
EPORT. LOGISTICS BIOKO TO BE ARRANGED BY AID/CAMEROON INCLUDING
RANSPORT, FOOD, LODGING AND TRANSPORT INTO CAMEROON. ACCORDING
O R. ANDERSON AID WILL REFUND HPI/WINROCK FOR MARTINEZ/SCHMIDT
NTERNATIONAL TRAVEL, PER DIEM AND PROFESSIONAL SERVICES AT $140
ER DAY EACH. PLS ADVISE SOONEST IF CONCUR WITH ABOVE

LS REQUEST MEETING IN MALABO WITH NCHEMA OF IGLESIA REFORMA
VINEA EQ. (IRGE) IN YAOUNDE WITH SAMUEL ESSONO AT PROTESTANT COLLEGE JOHNSTON AND
IFLE, BEKAERT AND VAN DYJK.

CHMIDT PROCEEDING BEMENDA ON HPI BUSINESS NOV 11 AND RETURNING
SA NOV 14. MARTINEZ RETURNING NOV 10.

EGARDS

ARTINEZ/SCHMIDT
INROCK INTERNATIONAL
10 720 6616

OCT 14 1980
264

MEMBYA 6223KN.....
BOSEDT 003.70

28

WINROCK MRLT

WU INFOMASTER 1-023143C250 10/16/80
TLX SECSTATE WSH
1487 GOVTPD SD WASHDC 101680 1131P
TWX 9107209616 WINROCK MRLT
WINROCK INTL LIVESTOCK CENTER
PETIT JEAN MOUNTAIN
MORRELTON ARK

REF: GOLDMAN/MARTINEZ/SCHMIDT TELCON

EQUATORIAL GUINEA AGRICULTURAL DEVELOPMENT.
653-0001. VISIT OF HEIFER/WINROCK TEAM

USAID/YAOUNDE IS PREPARING FOR UPCOMING VISIT TO
EQUATORIAL GUINEA. EMMANUEL TEBONG WANTS TO
ACCOMPANY MR. RAY RIFENBERG (USAID-DESIGN
OFFICER) AND I TO MALABO. REQUEST HAS GONE
FORWARD TO HIS SUPERVISOR . PROPOSED VISIT DATE
OF 28 OCTOBER NOT CONVENIENT FOR TEBONG AND DOES
NOT REALLY GIVE US ENOUGH TIME TO PREPARE THE
DOCUMENTATION WE WANT TO PRESENT TO THE MINISTRY.
WOULD APPRECIATE YOUR DELAYING VISIT BY ONE WEEK.
PLEASE NOTE THAT SPANISH PESETAS ARE NEEDED TO PAY
FOR ACCOMMODATIONS ON BIOKO. FOUR THOUSAND PER
NIGHT FOR LODGING, APPROXIMATELY SIX HUNDRED PER
MEAL.
PLEASE ADVISE. REGARDS, GOLDMAN/USAID/YAOUNDE 8223KN.
AMERICAN EMBASSY YAOUNDE CAMMEROON 6581

2266 EST

WINROCK MRLT

OCT 17 1980

29

WINROCK MRLT

9FB D103 11-1 F559 1 10/29/80 08:29 2549L LAK

9107206616 WINROCK MRLT
WINROCK INTERNATIONAL LIVESTOCK DECENTER
MORRELLTON, ARK.
REF SCHMIDT/API CABLE DATED NOVEMBER 21
TERMS OF REFERENCE ARE CONFIRMED. REIMBURSEMENT FOR
SCHMIDT TRAVEL AND PER DIEM AND FOR MARTINEZ
TRAVEL, PER DIEM AND CONSULTING FEES WILL BE MADE
SUBJECT TO AVAILABILITY OF FUNDS AND ALLOTMENT.
WE HAVE REQUESTED ALLOTMENT. REGARDS. GOLDMAN.
AMERICAN EMBASSY
YAOUNDE CAMEROON 6937
WINROCK MRLT

VIA GRAPHIC SCANNING

OCT 29 1980

APPENDIX II

EQUATORIAL GUINEA POULTRY DEVELOPMENT PROJECT
BASILE POULTRY PRODUCTION CENTER

FACILITIES DESCRIPTION, REFURBISHMENT SCHEDULE AND EQUIPMENT LIST

Facilities Description

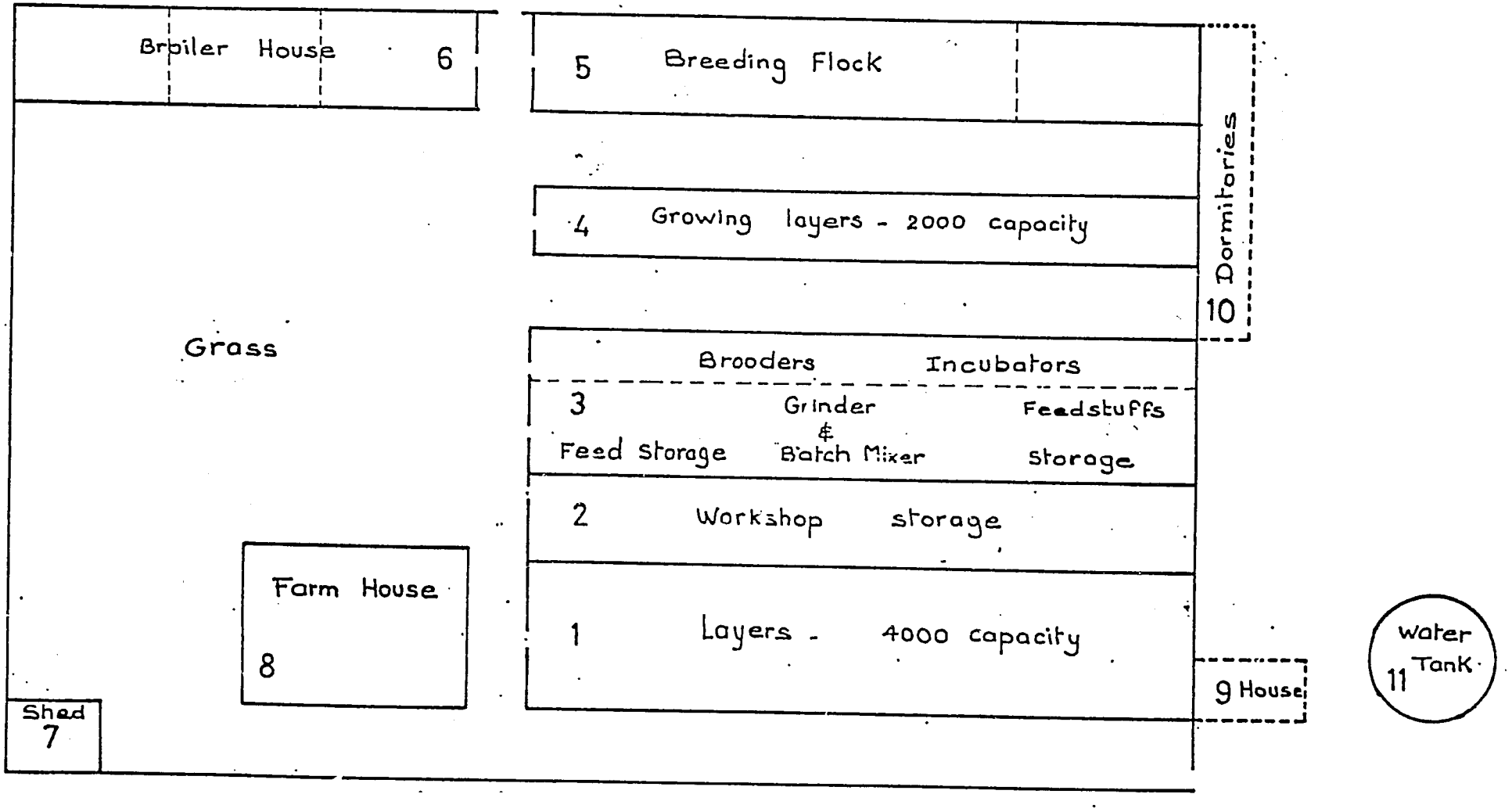
The poultry facilities are located in the town of Basile, 10 km from Malabo. The climate is slightly milder than in Malabo due to higher elevation. The facilities are within a walled area covering approximately 1½ to 2 acres. No blueprint plans or general layout of the facilities were available. The sketch presented in Figure 1 is an approximation of the current location of buildings; its primary purpose is to identify individual buildings in the refurbishing process discussed below.

Refurbishing Process

Currently, the facilities are in disrepair but they appear to be, for the most part, structurally sound. Much has been done in the past few months to clean up the effects of 10 years of abandonment. The proposed refurbishing includes repairs of floors, roofs and chicken-wire sides. Most of the refurbishing process can be completed within six months after project initiation. With the exception of chicken-wire mesh, roofing material (corrugated galvanized sheets), and cement, local materials and labor are available.

Buildings Description, Intended Use and State of Repair

There are six separate poultry production buildings in the compound. No details were available as to the specific use of each building, carrying



POULTRY PRODUCTION CENTER - BASILE

capacity or system of production before the farm was abandoned early in the Macias regime. The following building description, state of repair and proposed uses are given below as an initial planning tool for the project administrator.

Building No. 1: This building is approximately 150 X 36 feet and is currently used to house caged layers. It has a concrete floor and large, partially open sides. Ventilation is good. This building is well suited for caged layers, but is in need of roof repairs. The building has a potential capacity of some 4500 layers depending on cage arrangement. Presently, there are 1600 caged layers arranged in two rows which extend to two-thirds the length of building. The reported reason for not having more birds in this building is the lack of cages.

The three most obvious problems with the current system are the cages, the watering system and the manure disposal. Most of the cages are for growing birds and not for layers. This has caused egg breakage problems. The water system is in need of spare parts. The manure is dumped in gutters which flush out; however, this system is not working and it is likely that until the system is repaired, manual removal of manure (emptying trays into wheel barrows) is necessary.

It is proposed that this building be assigned exclusively for caged layers and that it receive priority in the refurbishing efforts. Immediate needs include repairing the roof, replacing the chicken-wire mesh on open sides, rewiring the electrical system and replacing the water pipe system. Labor and materials such as lumber are available locally. Chicken-wire mesh, galvanized steel roofing and electrical wiring will need to be imported.

Equipment requirements consist primarily of cages. The project will provide funds for complete batteries of layer cages with a capacity of 4,250 layers. This building will handle the total number of layers expected to be in production by early 1981 (4,000 to 4,500).

33X

Building No. 2: This 150 X 21 feet building is currently used to store unusable cages. The floor is mostly large gravel and pieces of concrete. It is humid and has poor drainage, ventilation and lighting. It is recommended that this building be converted into a general workshop and equipment storage area soon after projection initiation. Workshop and storage facilities are badly needed in view of the large number of broken cages and pieces of cages dispersed throughout the facilities. A concrete floor, chain-link fence-type partitions and end walls and doors are the primary repairs needed.

Building No. 3: This building is not in use except for a corner where feed has been stored. Parts of the concrete floor are badly cracked and uneven. The building exceeds 5,000 square feet in area. Some two-thirds of the floor space (width) is over three feet higher than the remaining one-third.

It is recommended that this building continue to be used as feed storage once it is cleaned, repaired and the rats exterminated. A small-size grinder and batch mixer (1/2 ton/batch) are proposed so that local or imported feedstuffs can be processed and mixed at the poultry production center.

The lower 1/3 portion of the building can be temporarily used for incubating eggs and brooding chicks. The incubator and brooders and the grinder and mixer need to be imported and are budgeted under the AID grant.

Building No. 4: This building is currently used as a layer house. It is approximately 150 X 15 feet with open sides. A tier of cages runs lengthwise of each side of the building with total capacity of about 600 hens (300 on each side). Lengthwise in the center of the building there is a three-tier battery of cages with a capacity of 560 hens per tier. Only one tier is in operation because of lack of bottom trays and other parts. Currently, the house has a total of 1,200 layers. If the center is repaired or replaced, the total capacity is close to 2,300 birds.

Except for electrical wiring and a number of minor repairs this building is in good condition. It is proposed that this building be converted to a grow-out house for layers. The grow-out cage batteries currently located in Building No. 1 can be transferred to this building. Thus, the one-time total capacity for growing hens is estimated at over 2,000 which is more than adequate for the proposed 4,000 layer flock.

Building No. 5: This building is approximately 150 X 24 feet with a partition dividing the building into a 90 feet and a 60 feet long rooms. The larger room has dirt floor and is currently utilized for housing molting birds. The smaller room has concrete floor in very poor state of repair and is not being utilized.

The project proposes that the larger rooms be used for the breeding flock. Incubation and hatching eggs from the farm's breeding flock will become an important activity as the demand for chicks by the small farmer increases. Eventually, the entire building is expected to be utilized by the breeding flock.

It is important that this building be cleaned, disinfected and the rats eliminated. Minor repairs are needed as well as electrical rewiring.

Building No. 6: This building is currently used as a layer grower house. The enclosed area which exceeds 2,500 square feet, is divided into 3 rooms (each room is lower than the preceeding room). The building is in fair condition, but needs electrical rewiring and other repairs. Also, the building needs to be thoroughly cleaned, disinfected and the rats exterminated.

It is proposed that this building be utilized for the production of broilers. It will easily handle the initial projected production of 4,000 broilers per year.

Building No. 7: This shed, opeon on two sides, houses a generator and serves as storage for cages, wood shavings (for bedding) and miscel-

35X

laneous equipment. A new generator is available for installation.

Building No. 8: The farm house is a two story building used for housing of personnel, office, egg storage and other purposes. Rehabilitation of the house includes plumbing repairs, painting, replacing windows and mosquito screens and possibly some electrical rewiring.

It is proposed that this house be assigned to the expatriate advisor as living quarters and central office. The second floor, consisting of four bedrooms, two baths, kitchen and dining/living room, can serve as living quarters. The first floor has sufficient space for two offices, a classroom, and a meeting room. The first and second floor have independent entrances so privacy for the living quarters is assured. All house and office furniture must be provided by the project grant.

Building No. 9: This two bedroom house will be assigned to the Guinean farm manager. Painting and some repairs are required.

Building No. 10: This facility consists of 11 small rooms and a cooking area. The project has assigned these rooms to trainee living quarters. Repairs needed include painting and repairing concrete walkways. An unfinished two room structure can be converted to toilets and shower room.

Building No. 11: The water tank is the source of water for the entire farm through gravity flow. The original source of water is a well (spring) located about 0.6 km uphill. The water appears to be a good quality and is plentiful during 8-10 months of the year. During the latter part of the dry season there is some reduction in well output.

The current problem with the water supply is the intake pipe from the well to the tank. This pipe is too small in diameter, is bent in many places and is "pinched" in several locations. This situation does not allow sufficient water to enter the tank. It is proposed that the entire length of the pipe be replaced with new, larger diameter pipe.

Priorities for Facility Rehabilitation

As mentioned earlier, the production facilities can be rehabilitated within six months after the equipment is ordered. Certain priorities are suggested in this section to assist the Center's administration prior to the arrival of the expatriate advisor.

A. The first priority is to continue the clean-up of the entire compound and to inventory equipment, cages (and parts of cages), supplies and birds. The feed storage area in Building No. 3 should be cleaned, rats exterminated and partitions made for storage of feed. Concurrently, and with the assistance of an official/local engineer, the Ministry must determine the labor and materials required to rehabilitate the facilities following the guidelines presented in "facility description" section.

B. Work should start as soon as possible in the repairs of Building No. 1, the layer house, in order to accommodate the existing flock of growing birds now located in Building No. 6 and in the farm house. Once this is accomplished, contract and farm labor can begin cleaning and disinfecting Building No. 6 in preparation for the necessary repairs and the subsequent start of the broiler unit. Cages for Building No. 1 should be ordered as soon as the contract is signed. Allowing two months for shipment and transport and one month for installation, Building No. 1 should be in operation three months after contract signature. Clean-up and repairs of Building No. 6 will take approximately one month. Thus, the broiler operation can be started four months after contract signature.

The water line leading to the water storage tank should be replaced immediately after delivery of the pipe (about two months into the project). Sufficient water supply is critical, particularly towards the end of the dry season.

37X

C. Soon after the contract is approved the farm house (Building No. 8) should be painted and repaired so that it will be ready for the expatriate advisor no later than two months after contract signature. Priority should be given to repairing the second floor of the house. It is recommended that these repairs be contracted locally by the Ministry of Agriculture. Farm labor should not be used for painting or plumbing repairs.

D. Work on cleaning, disinfecting and repairing Building No. 5 (breeding house) should start no later than two months after project initiation. Assuming three to four weeks for this task, the breeding house should be ready to receive the breeding flock of growing birds by month three of the project.

E. The incubating and brooding area in Building No. 3 must be ready to receive the equipment two to three months after contract signature. In case this area is unsuitable for this purpose the area under the farm house can be used. Clean-up, disinfection and white-washing are the only requirements.

F. The workshop and storage areas are not a critical component during the first few months of the project. A temporary workshop area can be located in Building No. 3 (where the grinder and batch mixer will be located) and broken cages can be temporarily stored also in Building No. 3. However, work on this building should start no later than six months into the project and completed by month nine.

G. Rehabilitation of the dormitories should receive the least priority since the training activity for small farmers does not begin until the beginning of year two. Assuming three months are required to complete the repairs, work must start by month nine, provided all the production facilities have been completed.

Equipment Requirements

The following list represents the equipment required to refurbish and repair the facilities at the Poultry Production Center at Basile. The unit costs are estimates at retail level in the USA.

Battery of cages for 4500 layers	35,000
2 incubators with capacity up to 500 eggs - (electric/kerosene powered)	3,000
Brooder cages for up to 1000 birds	1,000
3 km of chicken-wire fencing	3,000
3 km of PVC pipe assorted sizes and fittings	2,500
5 km of electric wiring with assorted sockets, switches, etc.	5,000
1 km of mild steel wire	500
100 gallons of assorted paints	1,000
1 oxy-acetylene torch and tanks	500
10 wheel barrows	750
15 shovels - flat and round	225
10 feed scoops	120
1 egg scale	35
1 bird scale	50
1 refrigerator	800
1 two-way radio (citizen band - base stations and 2 mobile stations)	1,500
4 step ladders	200
2 extension ladders	200
20 plastic buckets -various sizes	100
10 push brooms	50
1 set mechanics tools	750
1 set plumbing tools	250
2 debeakers	50
10 water hoses	200
16 egg baskets	250
2000 egg trays - plastic	500
Subtotal	$57,730
Furniture for Expatriate Advisor's house (bedrooms, living/dining room, refrigerator, stove, etc.)	10,000
Office furniture and equipment	1,500
Classroom furniture and equipment	500
Trainee dormitory furniture	1,500
Dormitory toilet and shower equipment	150
Grinder and batch mixer	7,000
Miscellaneous equipment and supplies	5,000
Total Equipment	$80,980
40% of total for shipping	32,392
TOTAL	$113,372

APPENDIX III

POULTRY AND EGG PRODUCTION SYSTEM - CEPAB

The poultry and egg production system envisoned for the CEPAB farm at Basile has four major characteristics:

- Dependence on imported feed.
- Dependence on imported chicks.
- A 4,000 layer unit.
- A 4,000 broiler operation divided into two units.

This discussion uses the production levels observed at the unit for its starting point. An estimated break even point is shown in Table 1 and net income under improved management is estimated in Table 2.

Egg Production

At the outset of the first year, 5,200 layer chicks will be purchased in order to attain a laying flock of 4,000 at the end of the first laying cycle. The current flock as well as those purchased in the first year will be sold at the onset of first molt. This will take place after about ten months of laying activity. It will also be necessary to purchase an additional 5,200 layer chicks during the fifth month of laying so production continuity will be maintained at the end of the first group laying cycle (see illustrative production calendar, page 5).

Broiler Production

Broilers will be purchased in groups of six-hundred with a total of nine groups purchased in the first year. Given a 20% death loss and the phasing of the sales, eight groups of five-hundred birds will be sold in the first year. In the second year of operation nine groups of six-hundred birds will be purchased. A carryover of one group from the first year will result in a total of 4,500 broilers sold in the second year (see illustrative production calendar, page 6).

Income and Expenses

Tables 3 and 4 following estimate the feed requirements and costs for the layer and broiler units. Table 5 illustrates the income and expenses for the total operation for two years assuming current production levels and prices at the November, 1980, level. A deficit of $5,428 is anticipated in the first year while a net gain of $17,702 is expected at the end of the second year.

Break Even Point

It is estimated that the first year deficit can be avoided if the laying rate is increased from 56% to 60% as shown below:

Table 1. CEPAB Layer Operation Break Even Point[1]

Current Production:	Egg production 56% Mortality 5%/month for 10 months = 50%	
Current income from eggs:		$142,800
Sale of 2,000 hens at first molt:		10,000
	TOTAL	$152,800
Estimated Costs:		
Feed		$120,678
Chicks		10,000
Medicine and Sanitation		8,000
Recurrent Costs		14,920
Depreciation		7,380
	TOTAL	$161,378

Net Loss $8,578 in first year.

This represents a deficit of 47,656 eggs per year or 133 eggs/day.
Current production is 2,240 eggs per day.
Therefore, would need approximately 2,373 eggs per day.

Thus, the egg production at the Basile Poultry Center could become self-sufficient if egg production were increased to 60%. This could be achieved through provision of the required amount of feed daily, ensuring that the waterers function properly, and a rigorous rat control program to minimize feed losses.

[1] Does not include broiler income or expenses.

41

Expected Outcome of Improved Management

With the application of improved management practices and with the increased price of eggs, it is estimated that substantial income can be gained from the operation of the farm as shown in Table 2 below. For the sake of realism, a 12% inflation factor has been added to the estimated expenses.

Table 2. Illustrative Financial Statement Assuming Improved Management[1]

		1981		1982
Income				
Egg Sales		$354,145		$354,145
Layer Sales		10,000		20,000
Broiler Sales		28,000		35,000
Total Income		$392,144		$409,145
Less:				
Expenses	$186,228		$180,098	
12% Inflation	22,347		21,611	
Total Expense		$208,575		$201,709
NET INCOME		$183,569		$207,436

1 Assumptions:
80% laying rate
$0.36 per egg
$7.00 per broiler sold
$5.00 per layer sold

42x

Table 3. Illustrative Production Calendar - CEPAB 1981-1982

			Layer Unit	Broiler Units I	Broiler Units II
1981					
January	Wk	4	Buy 5,200 chicks	Buy 600 birds	
		11			
		18			
		25			
February	Wk	1			Buy 600 birds
		8			
		15			
		22			
March	Wk	1		Sell 500 birds	
		8		Clean up	
		15		Preparation	
		22		Buy 600 birds	
		29			Sell 500 birds
April	Wk	5			Clean up
		12			Preparation
		19			Buy 600 birds
		26			
May	Wk	3			
		10			
		17		Sell 500 birds	
		24		Clean up	
		31		Preparation	
June	Wk	7	Group I begins laying	Buy 600 birds	Sell 500 birds
		14			Clean up
		21			Preparation
		28			Buy 600 birds
July	Wk	5			
		12			
		19			
		26			
August	Wk	2		Sell 500 birds	
		9		Clean up	
		16		Preparation	
		23		Buy 600 birds	Sell 500 birds
		30			Clean up

43

Table 3. (Continued)

			Layer Unit	Broiler Units I	Broiler Units II
1981 (Con't)					
September	Wk	6	Sell remainder of 1980 (2,000)[1]		Preparation
		13			Buy 600 birds
		20			
		27			
October	Wk	4			
		11			
		18		Sell 500 birds	
		25		Clean up	
November	Wk	1	Purchase 5,200 chicks (GP. II)	Preparation	
		8		Buy 600 birds	Sell 500 birds
		15			Clean up
		22			Preparation
		29			Buy 600 birds
December	Wk	6			
		13			
		20			
		27			
1982					
January	Wk	7		Sell 500 birds	
		14		Clean up	
		21		Preparation	
		28		Buy 600 birds	Sell 500 birds
February	Wk	7			Clean up
		14			Preparation
		21			Buy 600 birds
		28			
March	Wk	7			
		14			
		21			
		28		Sell 500 birds	
April	Wk	4	GP. II begins laying	Clean up	
		11	Sell 4,000 birds (GP I)	Preparation	
		18		Buy 600 birds	Sell 500 birds
		25			Clean up

[1] 2,000 assumes 50% death loss.

44x

Table 3. (Continued)

			Layer Unit	Broiler Units I	Broiler Units II
1982(Con't)					
May	Wk	2			Preparation
		9			Buy 600 birds
		16			
		23			
		30			
June	Wk	6			
		13		Sell 500 birds	
		20		Clean up	
		27		Preparation	
July	Wk	4		Start 600 birds	Sell 500 birds
		11			Clean up
		18			Preparation
		25			Buy 600 birds
August	Wk	1			
		8			
		15			
		22			
		29		Sell 500 birds	
September	Wk	5	Buy 5,200 chicks	Clean up	
		12		Preparation	
		19		Start 600 birds	Sell 500 birds
		26			Clean up
October	Wk	3			Preparation
		10			Buy 600 birds
		17			
		24			
		31			
November	Wk	7			
		14		Sell 500 birds	
		21		Clean up	
		28		Preparation	
December	Wk	5		Buy 600 birds	Sell 500 birds
		12			Clean up
		19			Preparation
		26			Buy 600 birds

Table 4. Feed Requirements and Cost
CEPAB - 4,000 Layer Unit

The following guidelines were used in estimating the feed required by the layer unit and the cost of the feed.

Assumptions

1. Imported feed for layers at $500/ton.
2. Imported feed for growing layers at $550/ton.
3. Total capacity - 4,000 layers.
4. Death loss 0-5 months = 20% (growing period).
5. Death loss 5-15 months = 10% (laying period).
6. Feed Consumption: Growers = 5.83 g/day average for 150 days.
   Layers = 120 g/day average for 300 days.
7. Layers are sold at first moult.

Feed Requirements

Growing birds: 58.3 g/day x 500 birds x 150 days = 43.75
Layers: 120 g/day x 4,250 birds x 300 days = 153 tons

Cost of Feed

Growing birds	= 43.75 tons x $550/ton	=	$ 24,063
Layers	= 153 tons x $500/ton	=	$ 76,500
	TOTAL		$100,563

46

Table 5. Feed Requirements and Cost
CEPAB - 4,000 Broiler Unit

The following guidelines were used in calculating the feed required by the broiler unit and the cost of the feed.

Assumptions

1. Total production of 4,000 broilers per year in eight batches of 500 birds each.
2. Cost per bird = $1.25 each.
3. Death loss 0-8 weeks = 20%.
4. Feeding period = 8 weeks.
5. Average daily feed consumption per bird = 90 grams.
6. Cost of imported feed = $550/ton.
7. Birds sold at approximately 1.5 to 1.75 kg.

Feed Requirements

90 g/day/bird x 4,500 average number of birds fed x 56 days = 22.68 tons.

Feed Cost

22.68 tons x $550/ton = $12,474

47

Table 6. Illustrative Financial Statement
CEPAB - Layer and Broiler Project, 1981-1982

	1981	1982
Income		
Egg Sales	$142,800[1]	$142,800
Layer Sales	10,000	20,000
Broiler Sales	28,000	35,000
TOTAL	$180,800	$197,800
Expenses		
Broiler Feed	12,480	12,480
Layer Feed	120,678	120,678
Layer Chicks	10,400	5,200
Broiler Chicks	6,750	6,750
Medicine and Sanitation	13,620[2]	12,690
Recurrent Costs	14,920	14,920
Depreciation	7,380	7,380
TOTAL	$186,228	$180,098
Balance: End of Year	-5,428	17,702

Net Total for 2 years: $12,274

1 Assumes constant prices.

2 Assumes 4,000 layers
56% laying rate
$0.18 EKU per egg.

LAPX

ASSUMPTIONS REGARDING 1981-1982 CASH FLOW ESTIMATE AND SUMMARY FINANCIAL STATEMENTS

1. Medicine and Sanitation: $1 per layer; $0.50 per broiler

2. Recurrent Costs:
   a. Labor - 3 laborers x $50/month each; 2 temporary workers x 120/month = $4,680/year.
   b. Transportation - $500/month average or $6,000/year.
   c. Utilities: $10/day x 365 days x 75% of time = $2,740/year or $228/month.
   d. Maintenance - $75/month or $900/year.
   e. Office Expenses - $20/month or $240/year.
   f. Other - $30/month or $360/year.

3. Depreciation:
   a. Vehicles: 1 pickup truck, 1 automobile, 1 motorcycle = $25,000 over five years = $5,000/year.
   b. Equipment: $118,372 over five years = $2,374/year.

4. Cost of Imported Chicks:
   a. Layers - $1 per layer.
   b. Broilers - $1.25 per broiler.

5. Feed costs and requirements as detailed above.

Table 7. Illustrative Cash Flow
CEPAB - Layer and Broiler Project - 1981

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Income													
Egg Sales[1]	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	142,800
Layer Sales									10,000				10,000
Broiler Sales			7,000		3,500	3,500		7,000		3,500	3,500		28,000
TOTAL	11,900	11,900	18,900	11,900	15,400	14,500	11,900	18,900	21,900	15,400	15,400	11,900	180,800
Expenses													
Feed													
Broiler	2,080		2,080		2,080		2,080		2,080		2,080		12,480
Layer	20,113		20,113		20,113		20,113		20,113		20,113		120,678
Layer Chicks	5,200										5,200		10,400
Broiler Chicks	750	750	750	750		1,500		750	750		750		6,750
Medicine and Sanitation	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	1,135	13,620
Recurrent Costs	1,243	1,244	1,243	1,244	1,243	1,244	1,243	1,244	1,243	1,243	1,243	1,243	14,920
Depreciation	615	615	615	615	615	615	615	615	615	615	615	615	7,380
TOTAL	31,136	3,744	25,936	3,744	25,186	14,494	25,186	3,744	25,936	2,993	31,136	2,993	186,228
NET	-19,236	+ 8,156	-7,036	-2,554	-9,786	+6	-13,286	+15,156	-4,036	+12,407	-15,736	+8,907	-5,428

[1] Assumptions:
Current level of egg production: 56%
Price per egg $0.18
Present flock will continue laying

50x

Table 8. Illustrative Cash Flow
CEPAB - Layer and Broiler Project - 1982[1]

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
Income													
Egg Sales[2]	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	11,900	142,800
Layer Sales				20,000									20,000
Broiler Sales	7,000		3,500	3,500		3,500	3,500	3,500	3,500		3,500	3,500	35,000
TOTAL	19,400	11,900	15,400	35,400	11,900	15,400	15,400	15,400	15,400	11,900	15,400	15,400	197,800
Expenses													
Feed													
Broiler	2,080		2,080		2,080		2,080		2,080		2,080		12,480
Layer	20,113		20,113		20,113		20,113		20,113		20,113		120,678
Layer Chicks									5,200				5,200
Broiler Chicks	750	750		750	750		1,500		750	750		750	6,750
Medicine and Sanitation	1,058	1,057	1,058	1,057	1,058	1,057	1,058	1,057	1,058	1,057	1,058	1,057	12,690
Recurrent Costs	1,243	1,244	1,243	1,244	1,243	1,244	1,243	1,244	1,243	1,243	1,243	1,243	14,920
Depreciation	615	615	615	615	615	615	615	615	615	615	615	615	7,380
TOTAL	25,589	3,666	25,109	3,666	25,859	2,916	26,609	2,916	31,059	3,665	25,109	3,665	180,098
NET	-6,459	+8,234	-9,709	+31,734	-24,669	+12,484	-11,209	+12,484	-15,659	+8,235	-9,709	+11,735	+17,702

1 Assumes Constant Prices

2 Assumes current level of egg production: 56%
Price per egg $0.18

APPENDIX IV

POSITION DESCRIPTION

Technical Advisor: CEPAB, Basile, Equatorial Guinea

Title: Technical Advisor

Function:

To administer a two year USAID funded poultry production, training and pilot extension program on the island of Bioko, Equatorial Guinea. The project objectives are to increase the supply of eggs and poultry to the people of Equatorial Guinea, to provide training for farm employees and extension agents, to develop and test pilot poultry production systems for small producers, and to coordinate a pilot, small farmer poultry training and extension program.

Reportability:

The Technical Advisor in Equatorial Guinea is reportable to the (contracting organization) the Board of Directors of the Centro de Produccion Avicola, Basile (CEPAB).

Responsibilities:

The overall administration and coordination of this project for a two year period. Specific responsibilities include:

1. Provide management assistance to the CEPAB Poultry Facility's managers. Such assistance will result in the renovation and successful operation of a 5,000 bird/year broiler operation, a flock of 4,000 laying hens, a breeding flock and a small hatchery.
2. Plan and conduct a weekly in service training program for the General Manager of CEPAB, the Assistant Manager, a Foreman and farm laborers.
3. Plan and conduct two training courses for a total of fifteen extension workers.

4. Assist in the selection of one extension worker to be assigned to CEPAB.

5. Plan and coordinate a small-scale, pilot poultry training and distribution program through CEPAB, local cooperatives and other community organizations. This program involves:

   a. Development of a just system whereby project participants are enabled to share the benefits of the program with others.

   b. To participate in applicant screening with a committee of the CEPAB Board of Directors.

   c. To conduct five (5) one week training courses for 10 participants each.

   d. To ensure and coordinate the inspection and approval of the participants poultry houses prior to receiving chicks and other inputs.

   e. To coordinate the distribution of chicks to participants.

   f. To ensure adequate follow up of project participants in collaboration with the Extension Worker.

6. Coordinate short term consultancies as needed.

7. Train CEPAB in financial and production records keeping.

8. Report monthly to contracting organization, CEPAB, and USAID on budgetary expenditures in accordance with the terms of the contract with USAID.

9. Report quarterly on project status to CEPAB, contracting organization and USAID/Yaounde.

10. Submit a report to CEPAB and contracting organization at the end of each year which delineates project achievements, problem areas and suggested solutions.

11. Participate in evaluations of the project at the end of the 14th month and at the end of the project.

12. Submit a plan for continued operation of the project under CEPAB upon the departure of the Technical Advisor from the field.

Qualifications:

The Technical Advisor should have:

1. A practical working knowledge of all aspects of poultry production in tropical areas.
2. The ability to inspire and motivate project personnel and limited resource farmers.
3. Competence in Spanish.
4. Strong administrative and managerial skills.
5. Prior experience in cross cultural development efforts.
6. Ability to live and work in difficult circumstances.

Authority:

The Technical Advisor has the authority to carry out the above responsibilities within the approved budget, policies, objectives and priorities of CEPAB.

Accountability:

The Technical Advisor is accountable to the Government of the Republic of Equatorial Guinea through the Board of Directors of CEPAB, USAID/Yaounde and the contracting organization.

APPENDIX V

EQUATORIAL GUINEA POULTRY DEVELOPMENT PROJECT
TRAINING COMPONENT

INTRODUCTION:

Two of the major constraints to the development of a livestock and poultry production in Equatorial Guinea are the lack of trained professional and paraprofessional staff; and the lack of experience in these areas among small farmers.

The Training Component of this project takes as its starting point the facilities at the Basile Poultry Center. From this point, training is provided to persons and groups at various points in the life of the Project.

I. Overview:

This project will provide a training coordinator in the person of the Technical Advisor, training materials, and facilities for upgrading people's practical skills in poultry production. By the end of the first year specialized training will have been received by the General Manager. An on the job training program for the Basile Poultry Center staff will also have been instituted.

By the second year of the project a model village level poultry facility will have been prepared, 15 extension workers will have received one week of training, and 50 farmers, selected by their cooperatives or other organizations, will have attended the training course.

II. Sequence:

A suggested time line for this component follows, showing the target date, activity to be completed and person(s) responsible for its completion. This timeline follows four general stages of this component: preparation, in service training, training of extensionists, and training of individual producers.

1981	Activity	Responsible Party(s)
May	General Manager completes 2 month training course. Training Meeting/ Classroom prepared.	Director Livestock
June	Technical Advisor Arrives	Contractor
July	Weekly In Service Training Sessions for staff instituted.	Tech. Advisor
Aug.		
Sept.		
Oct.	Training materials collected and prepared. Training Methodology,	Tech. Advisor, Farm Manager, and Director
Nov.	tested and taught to Center Staff	of Livestock
Dec.	Dormitory Facilities repaired Model small farm poultry facility.	Tech. Advisor and General Manager
1982		
Jan	One week course for 7 extensionists	Tech. Advisor, Farm Manager and Ministry of Agriculture
Feb	One week course for 8 extensionists	
March	Selection of one Poultry Extensionist to be attached to Project	Tech Advisor - Min. of Agriculture
April		
May	First Course - 10 farmers	Tech Advisor, Poultry Extensionist, Farm Mgr, Extension Agents
June		
July	Second course - 10 farmers	
Aug.	Third course - 10 farmers	
Sept.	Fourth course - 10 farmers	
Oct.		
Nov.	Fifth course - 10 farmers	
Dec.		

56

III. Training for the General Manager

It is recognized that the General Manager of CEBAP will require additional specialized training in poultry production and management. In order to provide the most relevant course of training the Director of Livestock will consult with the General Manager in order to determine the specific training needs and goals of the General Manager. In consultation with USAID, the Contractor and other parties, the Director of Livestock and the General Manager will determine the type of training required and the best location for such training. It is anticipated that the course will have duration of two months and will have been completed prior to the arrival of the Technical Advisor.

IV. In Service Training for Assistant Manager, Foreman and Laborers:

In keeping with the principle that the CEPAB Center is a learning facility, all staff and laborers will participate in weekly training sessions. These sessions will commence one month following the Technical Advisor's arrival. Training needs, goals and interests will be identified by the personnel and the Technical Advisor. The focus of the training will be upon identifying immediate problems and acquiring the skills to solve them quickly and to prevent their recurrence. The General Manager along with the Poultry Extensionist will participate in these sessions in learning or teaching roles as appropriate.

57x

SUGGESTED OUTLINE

Extension Worker Training Course

CEPAB

This suggested course outline follows the same sequence as the small farmer poultry course in the area of production. A second, and equally important component deals with improved skills in extension work.

Introduction:

- The importance of poultry production in family nutrition and the national welfare.
- The challenge of being an Extension Worker.

I. Getting Started:

A. Basic principles and skills in starting broilers.

B. Helping farmers identify community problems and needs and to plan a project.

II. Growing:

A. Basic principles and skills.

B. Teaching basic skills to farmers (practicum).

III. Disease Prevention, Control, and Marketing:

A. Basic principles and skills.

B. Teaching basic skills to farmers (practicum).

IV. Egg Production:

A. Basic principles and skills.

B. How to use records to help make decisions (practicum).

V. Hatching and Raising Chicks at Home:

A. Basic principles and skills.

B. How to help people evaluate their projects and plan for the future.

SUGGESTED OUTLINE

Small Farmer Poultry Course

CEPAB

Introduction:

1. Overview of importance of poultry to family nutrition and income.

2. Introduction of Four Basic Rules:
   a. Watch Carefully
   b. Feed Daily
   c. Water Always
   d. Keep Clean and Dry

3. Broilers: Getting Started.

   Caring for day old chicks.
   Building the poultry house.
   Making a brooder.
   How much feed to give.
   Providing water.
   How to tell if a chick is sick - Types of Diseases.
   How to measure and administer medicines.
   Storing feed.
   Keeping rats away.
   Keeping records.

4. Broilers: Growing.

   Removing and storing your brooder.
   How much feed to give. Supplemented local feeds.
   How to care for your water supply.
   How to tell if a chick is sick - Types of Diseases.
   Measuring and administering medicines.
   Special care of sick birds.
   Proper disposal of dead birds.
   Keeping records.

59x

5. Broilers: Keeping Them Alive and Marketing:

Broiler house sanitation.

Identifying sick birds - Types of Diseases.

When to sell your broilers.

How to select a rooster to keep for your flock.

After selling - cleaning and disinfecting house and equipment.

Preparation for the next group of broilers.

Record keeping.

6. Egg Production:

Fixing a place for layers.

Feeding layers - how much feed to give.

How to identify a sick hen - Types of Diseases - how to administer medicine.

How to estimate how many eggs you will get.

How to cull hens.

How to care for hens that are moulting.

7. Hatching and Brooding Chicks at Home:

Where to put your brooding hens.

Keeping them safe from rats.

How much feed to give them.

When the chicks hatch.

When to separate the chicks from the hen.

8. Course Conclusion:

Review of skills and information.

Participant evaluation of course and suggestions for improvements.

SUGGESTED SCHEDULE

One Week Small Farmer Poultry Course

CEPAB

Day 1	Arrival - Room Assignments	
	Evening - Introductions, orientation	
	Address by Director of Livestock	
	Review of 4 Basic Rules of Poultry Management	
Day 2	Broilers: Getting Started:	
	A.M.	Observation - Questions and Answers - Presentation and Demonstration
	P.M.	Basic Skills Practice: including record keeping
	Evening:	Review of Day - A. VI or other Presentation
Day 3	Broilers: Growing:	
	A.M.	Observation - Questions and Answers - Presentation and Demonstration
	P.M.	Basic Skills Practice: including record keeping
	Evening:	Review - Special Presentation
Day 4	Broilers: Keeping Them Alive and Marketing:	
	A.M.	Observation - Questions and Answers - Presentation and Demonstration
	P.M.	Basic Skills Practice: including record keeping
	Evening:	Review - Special Presentation
Day 5	Egg Production:	
	A.M.	Observation - Questions and Answers - Presentation and Demonstration
	P.M.	Basic Skills Practice: including record keeping
	Evening:	Review - Special Presentation
Day 6	Hatching and Brooding Chicks at Home:	
	A.M.	Observation - Questions and Answers - Presentation and Demonstration
	P.M.	Basic Skills Practice: including record keeping
	Evening:	Review of Course, Participants Evaluation of Course, Issuing of Certificates.

APPENDIX VI

MANAGEMENT SERVICES CONTRACT

The Basile Poultry Development Project presents a combination of Situations/activities that diverge somewhat from the basic norms under which most voluntary organizations operate in developing countries. First, the Basile Farm is an official, government-owned entity that require livestock management and technology inputs during the refurbishing phase to become an efficient and productive unit. Although the philosophy is to work through existing in-country institutions, voluntary organizations' primary concern is not the provision management services to such institutions. Second, the proposed services are highly specialized and therefore difficult to secure on a voluntary or low cost basis. Many voluntary organizations cannot justify, internally, the hiring of professionals at open market salaries.

The HPI team recommends that AID/Yaounde seek as the implementing agency an organization/institution that specializes in animal agriculture and is not bound by the above constraints. Such organization must also be capable of providing the necessary technical and backstopping support to the project.

The recommended two-year management and technical services contract to implement Phase I will have the following characteristics:

- AID will contract directly with the appropriate institution for the following personnel: (1) a poultry specialist for a period of two years in residence; and (2) consultants equivalent to four person months on site. The above personnel will work closely with MOA, the Basile Farm manager and AID/Yaounde in the execution of their duties. The poultry specialist will serve in the capacity of an advisor and will be responsible directly to the contracting institution which in turn will be accountable to AID.

62X

- All procurement of equipment, vehicles and other materials will be the responsibility of AID/Yaounde.

- The scope of the management services contract will follow closely the outputs and end-of-project-status of the overall poultry project.

- Provision will be made for extension and/or modification of the contract, under a Phase II grant, if it is determined (during the second year of the project) that the small producer component can be successfully incorporated into the project.

A sample budget is presented in Table 1 as a guide to the cost of the Management Services Contract.

Table 1. Budget Summary: Limited Management Service Contract - Basile Poultry Production Farm

Year	Year 1	Year 2	Total
Personnel			
Advisor[1/]	$ 40,000	$ 44,000	$ 84,000
+20% hardship	8,000	8,800	16,800
+18% fringes	8,640	9,500	18,140
Consultants			
Four months equivalent	8,800	8,800	17,600
Sub-total	65,440	71,100	136,540
Direct Costs			
Advisor[2/]			
Relocation-Airfare for two persons	4,200	5,000	9,200
Transport-Personnel effects	2,500	3,000	5,500
R&R -Europe[3/]	3,000		3,000
Travel & Per Diem[4/]	2,000	3,000	5,000
Consultants			
Travel-four trips total	4,200	5,000	9,200
Per Diem for four months ($92 x 120)	5,520	5,520	11,040
Sub-total	21,420	21,520	42,940
Indirect Costs			
Administration & Contingency (10%)	8,700	9,300	18,000
TOTAL	$ 95,560	$101,920	$197,480

1/ Advisor's qualifications are as noted in the project paper.
2/ Assumes project provides the advisor with completely furnished house, a vehicle and vehicle operating costs.
3/ Cost of two roundtrips (advisor and wife) to Europe.
4/ Primarily, air travel to Cameroon and to Rio Muni.

64