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UNCLASSIFIED

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

HAITI

PROJECT PAPER

INTERIM SWINE REPOPULATION

AID/LAC/P-161

Project Number: 521-0107

UNCLASSIFIED

PDAA 669

AGENCY OR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number

DOCUMENT CODE

3

COUNTRY/ENTITY

Haiti

3. PROJECT NUMBER

521-0170

4. BUREAU/OFFICE

USAID/Haiti

5. PROJECT TITLE (maximum 60 characters)

Interim Swine Repopulation

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
1 10 0 1 1 8 5

7. ESTIMATED DATE OF OBLIGATION

(Under "B." below, enter 1, 2, 3, or 4)

A. Initial FY 8 3

B. Quarter 4

C. Final FY 8 4

8. COSTS (\$000 OR EQUIVALENT \$) =

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	1,500		1,500	3,000		3,000
(Grant)	(1,500)	()	(1,500)	(3,000)	()	(3,000)
(Loan)	()	()	()	()	()	()
Other U.S.						
1.						
2.						
Host Country						
Other Donor(s)						
TOTALS	1,500		1,500	3,000		3,000

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ARDN	114	010				3,000		3,000	
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

010 070 250

11. SECONDARY PURPOSE CODE

113

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code BR BS
B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To produce and distribute improved breeding stock to Haitian farmers during the period immediately following the eradication of African Swine Fever in the country.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final 1 10 8 5

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)

17. APPROVED BY

Signature

Title

Acting Mission Director

Date Signed

MM DD YY
0 8 2 6 8 3

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

PROJECT AUTHORIZATION

NAME OF COUNTRY : Haiti
NAME OF PROJECT : Interim Swine Repopulation
NUMBER OF PROJECT : 521-0170

1. Pursuant to the Foreign Assistance Act of 1961, as amended, I hereby authorize the Interim Swine Repopulation Project for Haiti involving planned obligations of not to exceed \$3,000,000 (Three Million United States Dollars) in grant funds ("Grant") over a two-year period from date of Authorization, subject to the availability of funds, to help in financing the local currency and foreign exchange costs for the project.
2. The project ("Project") consists of a short-term effort designed to bridge the gap between the eradication of swine fever in the country and the planned IDB-financed repopulation activity due to begin implementation in 1984. The Project will provide funds to the Interamerican Institute for Cooperation in Agriculture (IICA) to defray the costs of technical assistance, procurement of equipment, supplies and labor, and other costs incidental to the production and distribution of swine to small Haitian farmers.
3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with AID regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as AID may deem appropriate:
 - a. Source and Origin of Goods and Services. Goods and services financed by AID under the Grant shall have their source and origin in countries included in AID Geographic Code 941 or in Haiti, except as AID may otherwise agree in writing. Ocean shipping financed under the Grant shall, except as AID may otherwise agree in writing, be financed only on flag vessels of countries included in AID Geographic Code 941 or Haiti.
 - b. Conditions Precedent to Initial Disbursement. Prior to any disbursement, or the issuance of any commitment documents under the Grant, IICA shall, except as AID may otherwise agree in writing, furnish to AID, in form and substance satisfactory to AID:
 - (i) a detailed time-phased implementation plan for the project, including clearly delineated roles and responsibilities for all project personnel;
 - (ii) a plan for the utilization of the funds resulting from the sale of culls and the possible sale of castrates from the surplus and culled swine stock, and from the inventory remaining in the nucleus breeding center at the end of the project; and
 - (iii) evidence that a project director has been named.

- c. Condition Precedent to Disbursement for Swine Breeding Stock. Except as AID may otherwise agree in writing, prior to disbursement under the Grant or to issuance by AID of documentation pursuant to which disbursement will be made for procuring swine breeding stock, the Grantee will furnish to AID, in form and substance satisfactory to AID, evidence that the nucleus breeding center has been tested for and found free of African Swine Fever.

Phyllis Dichter

Phyllis Dichter
Acting Mission Director

Date: September 29, 1983


DRE: RByers, rjb:9/28/83:0213A

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ADO, JVDLewis J. D. Lewis
RCO, FEObey F. O. E. 29 Sep 83
CONT, DShannon D. Shannon 9/29/83

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ACRONYMS

ADO	Agriculture Development Office, USAID/Haiti
ASF	African Swine Fever
BID	Banque Interaméricaine de Développement
DARNDR	Secrétariat d'Etat de l'Agriculture, des Ressources Naturelles et du Développement Rural
DRE	Development Resources and Program Evaluation, USAID/Haiti
EOP	End of Project
EOPS	End of Project Status
FAMV	Faculté d'Agronomie et de Médecine Vétérinaire (DARNDR)
GOH	Government of Haiti
HAMP CO	Haitian-American Meat and Provision Company
IBRD	International Bank for Reconstruction and Development (World Bank)
IDB	Interamerican Development Bank
IICA	Interamerican Institute for Cooperation in Agriculture
IMF	International Monetary Fund
IRR	Internal rate of return
JPIP	Joint Project Implementation Plan
LOP	Life of Project
NBC	Nucleus breeding center
PEPPADEP	Projet d'Eradication de la Peste Porcine Africaine/Développement de l'Elevage Porcin
PIDFP	Projet Intérimaire de Développement de l'Elevage Porcin
PNRP	Projet National de Repeuplement Porcin
SMC	Secondary multiplication center

I. RECOMMENDATION AND SUMMARY

A. Recommendation

Pursuant to review and approval of the proposed Interim Swine Repopulation Project by the USAID/Haiti Mission Project Review Committee, it is recommended that the Mission Director approve the project described herein for a total cost to AID of \$3,000,000 in supplemental ARDN grant funding over a twenty-four-month period. The project will be authorized by the Administrator in AID/W.

A waiver of competition for use of the facilities of the Haitian-American Meat and Provision Company (HAMPOC) will be required at the time the authorization is signed. The amount of the waiver will be approximately \$900 thousand.

B. Summary of Project Rationale

Following the identification of the outbreak of African Swine Fever (ASF) in Haiti, a viral disease with high morbidity rate in swine which threatened to spread to North America, the Government of Haiti (GOH) entered into an agreement with its neighbor countries--the United States, Canada, and Mexico--to eradicate the virus by eliminating the swine population, and eventually to repopulate the country with improved swine. The eradication phase has now ended, and the country is looking to begin the repopulation phase.

The Interamerican Institute for Cooperation in Agriculture (IICA) has undertaken a study at the request of the GOH for a long-term swine industry development project. The study has been the subject of a review by the IDB Board of Directors and the GOH Ministry of Agriculture (DARNDR); the IICA project design team is now preparing the final project paper for submission to the IDB Board. The IDB hopes to fund the project in FY 1984, and to begin implementation in 1985. In the interim, however, there is an urgent need for a preliminary effort at repopulation for those small farmers who have been disadvantaged by the slaughter of their swine and who will not have access to a source of breeding stock before the IDB project begins. This project is designed to bridge that gap.

In designing the project, the Mission project committee has been especially sensitive to the policy and economic climate of the country in the wake of the eradication of ASF, specifically the tight public sector investment budget. The committee has established certain design criteria aimed, on the one hand, at maximizing the efficiency and impact of the project, and on the other hand at minimizing the burden it places upon the already strained resources of the GOH, and of the Ministry of Agriculture in particular.

The project is based upon these factors as well as the technical considerations mentioned in the technical analyses. Briefly, these considerations can be stated as follows:

- (1) to produce and distribute improved breeding stock to the Haitian farmer in as rapid and efficient a manner as is possible;

- (2) to place as small a burden as possible upon the GOH's public treasury resources, either in the short or long term, through making as small an investment as possible in infrastructure and institution-building; and
- (3) to target the repopulation activity at the stratum of Haitian society which has suffered the most from the eradication program and the loss of his pigs: the small peasant farmer, often landless, whose primary occupation is agriculture.

Each of these three considerations is discussed in turn.

Project timetable. The raison d'être of the project is that the swine be multiplied and distributed as quickly as possible. The IDB-financed project is not due to begin execution before 1984, and the first pigs may not be available under the project until late 1985 or early 1986. It is crucial, then, that the AID-funded effort be mobilized in as brief a time as is possible.

The project is designed for a very rapid start-up. Within two months of project obligation, the technical team will be in place and the procurement of the swine breeding stock will have begun. Barring unforeseen circumstances, the first pigs will be available for distribution to SMCs within six months of start-up. Distribution will continue for approximately eighteen months, by which time the AID-funded project will have ended.

Recurrent costs. The design criteria developed for this interim swine repopulation project are different from those of many other USAID/Haiti projects in that no infrastructure requiring subsequent financing is to be built into the project. This is based in part upon the emergency nature of the situation, as well as temporal and financial limitations.

The lack of swine holding facilities in Haiti effectively precludes the design of a larger project, since construction of such facilities would be far beyond the scope of this effort. In addition, there were few facilities constructed under the PEPPADEP program which this project could utilize. However, it is likely that the project will benefit from the presence of well-trained field workers no longer needed by the eradication teams.

Targetting the poorest farmers. While all pig owners and managers have suffered from the complete eradication of swine from Haiti, the smaller farmers, for the most part, lost a significant portion of their savings as a result of the PEPPADEP action. Therefore, it is proper that this group have access to the first deliveries of breeder gilt pigs once they are produced in the secondary multiplication centers, and this project has been designed with that target population in mind.

The project design committee has stressed the importance of equity in the swine distribution program. As is discussed in the social soundness analysis, the candidate organizations for the Secondary Multiplication Centers from which the pigs will be distributed will be required to submit a proposed distribution program for IICA approval before they receive their swine stock, and each program will be reviewed for

conformance with the guidelines established by USAID and IICA to determine its fairness and practicability.

C. Summary of Project Description

The objective of the project is to produce a determined number of breeding stock to be multiplied at 50 to 100 secondary multiplication centers (SMCs) throughout Haiti. These SMCs will produce and distribute breeding stock to small farmers throughout the country. The project will last for two years and by the EOP will have placed 4500 breeding stock in SMCs with the potential of producing 50,000 pigs per year. From this production, approximately 23,000 pigs (19,000 females and 4,000 males) will be available for distribution to farmers each year.

The distribution program will take advantage of the well-developed network of locally-based private voluntary organizations located throughout Haiti, and especially those working in the field of agricultural development with the farmer. These organizations offer the advantages both of being able to respond quickly to the demands of the project, and of being able to assure equitable distribution, seeing to it that it is the poorest farmers who receive the pigs.

The project thus consists of two primary components: swine importation and reproduction, and distribution of feeder pigs.

Importation and reproduction. Swine will be procured from US pig farmers on a competitive basis, and AID personnel will personally inspect each pig before it is approved for export to Haiti. Swine will be airshipped to the airport in Port au Prince and transferred to the nucleus breeding center there (HAMPCO). They will be bred, weaned and fed under modern conditions until they reach the age of eight weeks.

The facilities for the nucleus breeding center will be leased from a US company based in Port au Prince, the Haitian-American Meat and Provision Company (HAMPCO). At the present time, the HAMPCO facilities are the only ones in the country of sufficient size and quality for the multiplication program. HAMPCO has ceased its swine operations since May of 1982, when the ASF outbreak threatened the swine population there.

The project will be coordinated by the Interamerican Institute for Cooperation in Agriculture (IICA), an international research and extension organization based in San José, Costa Rica. IICA was heavily involved in the PEPPADEP swine eradication operation, and is an ideal candidate for leading the interim reproduction program; the IICA staff in Port au Prince has had a good deal of experience in swine management, and has demonstrated its competence at managing a large and complex operation.

The present project will fund two technicians, an extension specialist and a swine production expert, to augment the local IICA staff. These personnel will have direct control over the project inputs and project execution, and may establish a separate office within IICA/Haiti to administer the project. In addition, short-term technical assistance in a variety of disciplines will be provided as required. IICA will appoint a project director, an IICA employee, as well as provide veterinary and other expertise from their pool of resident and visiting technicians.

Distribution. The project design team has undertaken an inventory of PVOs and other organizations working successfully with small farmers throughout Haiti. Many of these organizations are listed in Annex K. Most of those on the list have been contacted by project design personnel to determine their interest in participating in the distribution program.

These PVOs will, in turn, construct low-cost swine breeding facilities (farrowing barns) at which the pigs distributed to them from the nucleus breeding center (HAMPCO) will multiply. Once that generation of pigs produces offspring, the offspring will be sold or distributed to local farmers. The specific system by which the offspring will be transferred to the farmer will be the subject of a distribution plan designed individually by each SMC and approved by IICA pursuant to criteria agreed to by Aid. It is likely that many SMCs will wish to design a revolving-fund system through which they can recover the costs of construction and feeding that they are required to incur. In addition to PVOs, other community-based groups, including GOH organizations, will also be eligible to sponsor SMCs under the project provided they satisfy the criteria for operating such centers.

The body of this Project Paper consists of technical analyses in which the project is described in much greater detail. These analyses are summarized here:

Summary of technical analysis. The project is technically feasible and is designed to permit production of 4500 improved breeding swine by the EOP for distribution to cooperating SMCs. Some 450 swine will be imported from the US and raised under stringent hygienic conditions in Haiti. Other methods of pig production and distribution are discussed and dismissed for various technically-based reasons. The breeding plan has been designed to maximize production in as short a time as possible.

Summary of economic analysis. The project is economically feasible and promises a high internal rate of return--nearly 70%. This is due in large measure to the scarcity of pigs resulting from the eradication of the entire swine herd in the country, the high demand for breeder pigs among the rural poor, and the impossibility of obtaining pigs from other sources for the foreseeable future. The project has a high return due to its rapid implementation plan and its ability to meet a short-term need very efficiently. Eventually, in perhaps ten years, the national swine industry will return to its previous levels of production, even if no other swine repopulation program in addition to the present one is carried out.

Summary of social soundness analysis. Pigs constitute a primary source of savings for the majority of the Haitian poor, and provide them with an important protein source as well. The principle of equity in the distribution of breeder pigs is paramount, and can best be assured through judicious use of private voluntary organizations as the principal, but not the exclusive, outlets for breeder swine. The Haitian peasant will be able to provide or secure the labor, feed and veterinary inputs necessary to ensure the successful husbandry of the improved stock to be introduced under the project.

Summary of institutional analysis. IICA is the best-qualified organization in Haiti to undertake the project. They have the institutional and financial resources necessary for project implementation. The distribution plan for pigs is both equitable and efficient, given the temporal and financial constraints to which the project is subject. The GOH's role is spelled out.

D. Result of Bureau Review

The PID for this project was reviewed in Washington on May 23, 1983. Subsequently, a guidance cable was sent to the Mission and a number of design considerations were included. The guidance cable is appended as Annex A. The guidelines listed therein were followed closely in preparing the present project paper, and the results of this process are given below:

Project impact (paragraph 2): A close review of the production schedule for the project showed that the number of pigs to be produced over the LCP at the Nucleus Breeding Center is something more than 4500. These breeder pigs (F₁ generation) will in turn be distributed to Secondary Multiplication Centers (SMCs), which can be expected to produce approximately 24,000 F₂ offspring per year for distribution to farmers. Over time the F₂ pigs will in turn breed again and the national herd size will grow; it is not possible to determine the rate of growth beyond this point, however, as a certain number of pigs will be slaughtered for pork, although an order-of-magnitude estimate is made in the economic and technical analyses of this document. The topic of herd growth is also discussed in the technical analysis and the economic analysis.

Survivability (paragraph 3). The USDA swine production specialists who participated in the design team discuss this subject in their report, which served as the basis of the technical analysis. Improved breeds of swine have shown excellent survivability in the other tropical countries into which they have been introduced. Since May of this year, the sentinel program has introduced a substantial number of improved US swine of the type to be bred under this project, and they have demonstrated excellent adaptation. The US is the best source for improved, disease-free swine.

GOH involvement (paragraph 4). The project will not be implemented through the Ministry of Agriculture, primarily because the GOH is not in the financial position to undertake a swine industry development program at this time. The GOH will be the beneficiary of a major IDB loan for this purpose. The present project will be implemented primarily, although not exclusively, through private sector channels and private voluntary organizations. The GOH regional livestock centers may qualify as SMCs on the same basis as the PVOs through which the project will be implemented, but the project will not provide on-going financial support for either of their activities. The SMCs certified by IICA and AID will be eligible to receive pigs and limited support for feed and feed supplement, other essential inputs, and training.

NADL component (paragraph 5). The previously-contemplated \$50,000 support for the national animal disease laboratory has been dropped from the project. In place of this support, the budget has a provision for medical support costs; the swine production specialist may choose to use the facilities of the NADL or to contract with a private sector laboratory for specific diagnostic tests.

Payment scheme (paragraph 6). Repayment arrangements will be at the discretion of the individual SMCs, with prior USAID and IICA approval of any repayment plan. This is discussed in the social soundness analysis.

Lead institution (paragraph 7). The project will be obligated by means of a Cooperative Agreement with IICA. The participating governmental and non-governmental organizations will be selected according to the criteria set forth in the social soundness analysis herein.

IDB program (paragraph 8). The Mission has been in close contact with IDB officials in Port au Prince and has laid the groundwork for close collaboration with them throughout the life of the project. Furthermore, as the IDB project design team undertakes its visit over the course of the next year, it will work closely with AID technicians and program personnel.

Title II commodities (paragraph 9). Title II commodities located in the country and unfit for human consumption will be used whenever they are available, but no discrete shipment of such commodities will be made for swine feed. See the technical analysis.

IEE (paragraph 10). The IEE, requesting a negative determination, has been approved by the LAC Bureau environmental officer. To monitor the role of ticks in the transmission of ASF, the project will fund an entomology graduate student for the life of the project, in accordance with the recommendation in the epizootiological annex.

E. Project Preparation and Review

The following USAID personnel were significantly involved in the development of this project:

- David Adams, DRE
- Barry Burnett, DRE
- Richard Byess, DRE
- Phyllis Dichter, D/DIR
- Marion H Ford, Chief, ADO
- Harlan H Hobgood, Director
- John V D Lewis, ADO
- F E Obey, RCO
- Shirley Pryor, OEA
- Don Shannon, CONT
- James Talbot, REMS
- Abdul H Wahab, ALO
- Robert Wilson, ADO

Non-USAID personnel instrumental in the development of the project include:

- Percy Aitken-Soux, Resident Representative, IICA
- Johnnie Copelin, State of Mississippi Extension Service, USDA, Swine Production Advisor
- Farouk Hamdy, DVM, PhD, USDA
- James Hester, Chief Environmental Officer, LAC Bureau, AID/W
- Raul Hinojosa, LAC/DK/RD Livestock Advisor (detailed from USDA)
- Nicholas Hobgood, PVO advisor
- Sharon Matter, University of Pennsylvania, Livestock advisor

Secretarial assistance was provided by Lisa Abbott.

II. PROJECT BACKGROUND AND RATIONALE

A. Project Background.

Poverty in Haiti. Haiti is the poorest country in the Western Hemisphere, with a per capita income of only \$260 (1982 IBRD estimate). Although characterized by an agrarian culture, Haiti has nevertheless suffered since independence from neglect of its agricultural economy, which consists for the most part of extremely small holdings and mixed cash and subsistence cropping. Mechanization of farmwork is almost entirely absent, and cultivation is generally undertaken with the help of a pointed stick or rudimentary hoe. The most basic of extension, research and input delivery services necessary to counter this backwardness are lacking.

Haiti has been a pig producing country since 1492. The hardy Creole Haitian pig evolved and developed into its present condition over the last 400 or 500 years. The creole pig in Haiti, whose development as a breed remained in the hands of the peasant farmers, served two major roles within the Haitian culture: as a major source of protein for the family, and as the principal source of financial security for the farmer.

By 1980 both of these roles were threatened and endangered by the introduction of a highly destructive disease unique to swine. This disease, known as African Swine Fever, was identified in the island of Hispaniola in 1978. It is believed that the disease was introduced by means of diseased meat transported by airplane from the Mediterranean countries. African swine fever is highly contagious and has an extremely high morbidity rate. The infective agent is believed to be a virus for which no preventive or curative measure has been developed.

The presence of ASF in the island of Hispaniola posed a serious threat to the swine industry of the US, Canada, and other countries in the western hemisphere. The introduction of the ASF virus to the American mainland would have represented tremendous losses to the swine industry and an impossible task in controlling its spread.

An emergency campaign was mobilized to eliminate the disease from the island of Hispaniola through massive destruction of the island's entire pig population. To this end the governments of the US, Canada, and Mexico began to coordinate actions within the Dominican Republic and Haiti. A massive eradication program began in 1979 and is continuing, although the slaughter program officially ended in June of 1983. These efforts were considered a success, with the eradication teams reporting an elimination of a total of 375,549 pigs by the end of June 1983 at a cost of \$9,365,420 (IICA/Haiti "ASF Progress Report", July 21, 1983). An intermediate search (known as raking) for any straggler pigs that may have been missed by the eradication program is currently under way. To date, only a few pigs have been discovered by the PEPPADEP search teams, of which two are believed to be infected.

IDB Program. In the original agreement between the GOH and IICA, it was required that, before the eradication of the national herd was initiated, the GOH be assured of external support for the repopulation program. At the time of the signing of the IICA/GOH agreement, the Interamerican

Development Bank (IDB) was the only source of funding available to offer such assistance. However, the IDB made its offer contingent upon the successful completion of the eradication program and final negotiation of the formal loan agreement. In October of 1982, the IDB contracted with IICA to conduct an in-depth study of the mechanism needed to conduct a systematic repopulation program.

The resultant study, entitled Swine Repopulation, Sanitary Surveillance and Development of the Swine Industry, was submitted to the GOH and the IDB on April 11, 1983 for their review. It is a comprehensive three-volume study which sets forth a national plan for swine repopulation. The proposal calls for a four-year project totalling \$18.62 million, of which the IDB is requested to provide \$14.442 million in loan funds. The GOH and the private sector together would finance the remaining 23%.

The IDB-funded proposal envisages the construction of a minimum of two nucleus breeding centers in Port au Prince, four multiplication centers, to be strategically located throughout the country, and up to 50 demonstration centers to be built for farmer training and swine distribution.

IDB breeding program. According to the proposed breeding plan in Annex II of the IDB report, pure lines of the Duroc, Yorkshire, Berkshire and Hampshire pigs would be maintained in the two nucleus breeding centers. These purebreds would be crossed under controlled conditions to provide hybrid progeny (F₁) for the multiplication centers. These hybrid progeny are expected to possess a genotype significantly superior to that of the Creole swine population. It is also believed that these hybrid progeny would acclimate and readily adapt to Haitian environmental conditions. The offspring of the F₂ generation would then become available for distribution to demonstration centers and to interested farmers.

If the IICA study for repopulation is accepted by the IDB, and if Haiti is declared free of ASF by February 1984, the loan agreement could be signed by March 1984. Assuming that the GOH fulfills the conditions precedent for drawing upon the loan fund by July 1984, the implementation of the repopulation phase can begin by August 1984. The first batch of pigs consigned for distribution to affected peasants, under these conditions, will not be available until the end of 1987.

The major constraint facing the GOH is the absence of an organization to coordinate the IDB repopulation scheme. This organization, unlike PEPPADFP, must be fully funded by the GOH.

The IDB loan is designed to finance construction, the importation of pigs, and provision of a line of credit to the IDAI or the BCA for onlending to farmers for the purchase of pigs from the GOH multiplication centers. It will not finance future recurrent costs of the GOH.

B. Project Rationale.

Reason for USAID Intervention. Two principal reasons underlie USAID/Haiti's interest in becoming involved in the repopulation program.

Meeting the shortfall of swine. The IDB proposal for swine industry development, although technically sound, does not respond to the short-term needs for a swine repopulation program directed to the small producer. Some small producers have been without pigs since mid-1978, when 21,000 hogs along the Dominican border were destroyed to prevent the spread of ASF into Haiti. If the first breeding pigs from the IDB program are not available until late 1987, as projected, some farmers will have been without their most important source of security for over eight years.

Improvement of the Haitian swine gene pool. The eradication of ASF has presented the international agricultural community with an excellent opportunity to improve the productivity of the Haitian swine industry. The pigs to be imported under this program will be carefully selected from among the highest producers in the world, both in terms of fertility (profligacy) and feed conversion. The introduction of these breeds will permit the national agricultural sector to make a new beginning toward a modern swine industry. This would be a sufficient basis for undertaking a swine project in Haiti even if the eradication of the swine population had not occurred.

US Interests. In addition to the above short-term considerations, the United States has a clear and well-documented interest in the long-term development of Haiti. This interest has political, economic, and humanitarian dimensions. The US and other donor countries and agencies have begun a serious effort aimed at aiding the Government of Haiti to put in place an equitable and sustainable development program. AID provides assistance to the private and public sectors of Haiti, in the form of capital assistance, technical assistance and training.

In addition to these considerations, the US is viewed by many as the sponsor of the eradication program, and as having a responsibility for restoring the country's swine stock to its pre-ASF level.

Relationships to CDSS and GOH Priorities. Although this project is by nature an emergency activity, and as such was not specifically mentioned in any prior year programming documents, it will advance the Mission and GOH priorities described at length in the FY 1984 and 1985 CDSSs. The primary sectoral strategy objective which will be addressed by the project is an increase in small farmer income. Cross-sectoral strategic objectives which will be advanced include: (a) improving the nutrition of the rural poor; (b) improving livestock management practices among some target farmers; (c) fostering the appropriate use of private and voluntary organizations (PVOs); and (d) promoting the use of the private sector in development programs.

III. DETAILED PROJECT DESCRIPTION

A. Goal and Purpose.

The goal of this project is the restoration of the standard of living of Haiti's pork producers to the level existing prior to the outbreak of African Swine Fever. As is stated elsewhere in this paper, the economic and social impact of the eradication of the entire swine population in Haiti has been enormous. With virtually no other means of saving or investing his money, the Haitian peasant relies heavily upon swine as a store of value, and as a form of insurance against crop failure.

The purpose of the project is to produce and distribute improved breeding stock to Haitian farmers during the period immediately following the eradication of ASF. As described in detail in this document, the project has been designed to achieve this purpose as expeditiously and simply as possible, involving a minimum of organizations and a minimum of recurrent costs upon the Government once the EOP is reached.

B. Project Strategy

The strategy underlying the Interim Swine Repopulation Project is formulated upon a variety of considerations, of which one of the most important is the current economic climate in Haiti. One of the results of the GOH's ongoing discussions with the International Monetary Fund (IMF) has been a severe reduction in GOH public sector outlays for investment. This has resulted in cutbacks in many areas, with the Agriculture sector being one of the hardest hit. As a result, the GOH is at a severe fiscal disadvantage at a time when the need for a major swine industry development project is increasingly pressing.

It was evident from early in the project design that the GOH is not currently, and cannot be expected to be over the foreseeable future, in a position to undertake a major repopulation effort requiring either large investments dependent upon the public sector investment budget, nor substantial recurrent costs upon completion of the project. This was perhaps the most important design criterion considered by the project committee.

Alternative intervention strategies. These considerations led the project committee to consider a variety of unconventional avenues to project administration. During the formulative phase of project design, a number of approaches to the problem of repopulation were discussed. Four major strategies in addition to the one ultimately chosen by the Mission emerged from these discussions:

- (1) Use of sentinel pigs for repopulation (the "do-nothing" approach). PEPPADEP is planning to import up to 2000 swine for use in the sentinelization program, independently of any proposed repopulation program. In theory, these pigs could serve as a stock for a national repopulation program, and some will undoubtedly be retained for breeding. However, it is not at all clear how this stock could be employed for a coordinated repopulation program. The pigs will have been scattered throughout the country, each having been posted in several sites by the time the sentinelization phase is completed, and

will have contracted a variety of diseases. The stock for a breeding program should be in the best health possible and free of any disease. In addition to the health considerations, the ownership of the sentinel pigs is open to question (many farmers we interviewed in whose care the sentinel pigs had been put were under the impression that they would retain ownership of the pigs once the program had ended). Finally, the effort involved in locating and transporting the pigs to a central site for breeding would be enormous, and a great number of people would be required.

- (2) Pursuing a repopulation program through the Ministry of Agriculture. The Mission discussed the possibility of working through DARNDR to utilize existing DARNDR facilities in the north (at Cap Haitien) and the south (at Les Cayes) as primary multiplication centers. USDA technicians who visited these sites reported that they are not in good repair, however, and that they would require extensive modifications in order to be useable for project purposes. The Livestock Office (Direction de l'Elevage) within the Ministry does not have the manpower necessary to implement a project of this scale without substantial support to its operating budget. The Mission concluded that the costs in time and training would be inordinately high to achieve the project purpose.
- (3) Direct importation of US pigs to secondary multiplication centers. The apparent advantage of this approach is that it spares the project the cost of leasing a facility for in-country breeding. Upon closer examination, however, it is clear that much more than trucks would be needed to distribute the pigs.

If pigs were brought in for delivery directly to SMCs, facilities would still be needed to hold the pigs in quarantine for 30 days prior to distribution. If 4,500 breeding animals were brought in for direct distribution, they would have to be brought in at a rate of approximately 300 pigs per plane load every 45 days, counting 30 days in quarantine and 15 days to clean and disinfect the quarantine facility prior to arrival of next load of pigs. Therefore to import 4500 pigs for direct distribution, a facility would still be needed full time for approximately two years. Essentially the same levels of inputs--feed, vehicles, and manpower--would be required to maintain these facilities as would be required for an in-country breeding program.

It was also acknowledged that the first generation of pigs imported will not be acclimatized to tropical conditions immediately upon arrival, and that they would suffer a higher mortality rate if they were immediately distributed. It is only through a program of in-country breeding that the survival of the offspring can be assured.

- (4) Importation of breeding stock from neighboring countries. Concern was expressed that improved American breeds of pigs might not be adaptable to local conditions, and that other "tropicalized" breeds might be more appropriate. The experience with repopulation in other countries such as the Dominican Republic, however, proves the contrary. Improved varieties--or rather their offspring--survive quite well under conditions similar to those in Haiti. The HAMPOO

hog raising experience, as well as the performance of the US-source sentinel pigs currently in country, demonstrate this very well. The fact remains that careful breeding can assure better performance than haphazard acclimatization, even if the latter may have taken place over several centuries.

Animal health is another factor. In the wake of the eradication effort, the country will be free of many swine diseases in addition to ASF. It is therefore most appropriate to avoid importing diseased pigs as the repopulation effort begins. At present, pigs that meet the health and quality standards elaborated in this document are most easily obtained in the United States.

Two other countries have been suggested as possible sources of breeder pigs: the Dominican Republic and Mexico. However, the DR is still conducting its own repopulation program after their own ASF eradication, and pigs from there would either be unavailable or extremely expensive. The DR has also begun to experience animal disease problems due to lax import standards for health. Mexico is currently experiencing an outbreak of hog cholera and could not meet the health standards specified for the importation of pigs into Haiti.

Given the background of these four alternative approaches, the project committee concluded that the most feasible and cost-effective strategy for swine repopulation is to import breeder swine from the US, to multiply them here, and to distribute their offspring to eligible governmental and non-governmental organizations throughout the country. These secondary centers would then be responsible for distribution of the F₂ offspring to farmers.

C. Project Components.

The project thus consists of two essential elements: swine importation and breeding, and the distribution of the offspring to selected PVOs and other community groups:

Swine importation. The swine stock to be procured under the project will be produced and sold by US swine farmers; the procurement will be the subject of a competitive bid designed to select the best-qualified producer and the lowest-cost submission. Subsequently, AID/W livestock advisors will select the stock and approve the export.

The swine will be brought to Haiti and bred here. It is estimated that, once the program is under way, 160 offspring will be produced per week, with approximately one half of those eventually fattened and distributed, at maturity, to SMCs.

Distribution program. Once the F₁ generation pigs have been brought to market weight in the HAMPCO facility, they will be distributed to a variety of non-governmental organizations (NGOs) who will establish smaller, secondary breeding centers. These NGOs will then sell or give the F₂ offspring to small farmers, in accordance with a protocol established jointly by IICA and USAID/Haiti.

This protocol will call for potential SMC managers to certify compliance with the project's equity criteria by preparing:

- (1) a technically acceptable secondary multiplication center, with no less than a 10-sow capacity, to be constructed at the local organization's own expense. The economic analysis shows how much of this expense, local labor, and local materials can be had in kind;
- (2) a management plan, showing how the construction and operation of the SMC is to be financed and how their costs are to be recovered without the cost of the breeder gilts exceeding the purchasing power of the poorer peasants; and
- (3) a distribution plan, showing how these middle- to lower-level peasants are to gain access to the bulk of the breeder gilt output of the SMC--at least 50% of the total piglet output.

Participating organizations. The principal implementing organization is the Interamerican Institute for Cooperation in Agriculture (IICA), an international agricultural research organization based in San José, Costa Rica, with a permanent office located in Port au Prince. IICA has been heavily involved in the swine eradication program and has developed an extensive information bank on subjects closely related to the swine industry in Haiti. They will assume the entire responsibility for project execution.

In addition, technical personnel will be recruited by IICA to augment their local staff.

D. Project Inputs and Outputs

AID will provide \$3,000,000 in grant funds to IICA over the life of the project. These funds will be used to finance three discrete activities:

- swine production and breeding (\$1,388,500, for the importation of breeding stock, and the procurement of supplies and feed necessary to bring them to adequate weight and size for distribution to farmers);
- distribution and extension (\$332,000, for the administrative costs of identifying and working with SMCs and transporting the swine stock to them, and providing limited extension support); and
- lease of the HAMPCO facilities (\$696,000). The remaining costs include those for IICA overhead and for the laborers at the NBC.

One of the largest single budget items is feed, projected to cost around \$600,000 over the life of the project. Feed elements will be procured in country and mixed at the HAMPCO feed mill by project technicians.

Two vehicles will be procured by IICA for project personnel, and a 20-foot bed truck will be purchased to transport the feeder pigs once they reach distributable size.

E. Beneficiaries.

The beneficiaries of the project are Haiti's smallest farmers, those who were most severely affected by the elimination of the swine population during the eradication of ASF from the country.

The project has been designed to maximize the number of farmers benefitting from the activity. As the first generation of swine reaches the rural areas, approximately 4,500 head will be distributed to SMCs. As the second generation is produced, this number will increase to approximately 50,000 head per year, at least one half of which will be distributed directly to small farmers. The number of direct beneficiaries is thus at least 25,000 farm families per year.

An expanded description of the beneficiaries is given in the social soundness analysis.

IV. PROJECT ANALYSES

A. Technical Analysis

This analysis is divided into three sections, covering (1) the background of the swine eradication and repopulation effort; (2) a description of the proposed breeding program, and (3) a series of estimates of the numbers of pigs to be produced.

PART I. BACKGROUND OF THE PROGRAM

Symptoms of ASF. A very good description of the symptoms of the disease is given in the epizootiological annex. Briefly, ASF is a highly infectious viral disease of swine. Some symptoms include very high temperature, splotched skin, an enlarged spleen, and a high rate of abortions. The symptoms are similar to those of hog cholera, and in fact the first outbreak on the island was suspected to be hog cholera until further tests were performed. It is primarily transmitted from direct contact with infected animals, physical transmission from one unit to another, such as manure on someone's boots or shoes, or by consumption of incompletely cooked pork products carrying the virus by a pig. The mortality rate, depending on the specific strain, ranges from below 50% to 100%.

Swine are the only mammals known to carry the African Swine Fever virus. African Swine Fever has been in existence for a long time in other parts of the world, and the disease has been studied extensively. Thus, it is not likely that any new mammal carriers of the disease will be identified. Reports that the mongoose is a carrier for the disease are unfounded: the mongoose is a carrier for rabies, which may be the source of the confusion. Rats do not carry ASF, although they are carriers for anthrax.

Ticks as vectors. In Europe, a certain species of tick can carry the African Swine Fever virus. It takes time for the insect to develop the ability to become a carrier of such a disease. Also, it is only in certain areas that the tick is a carrier for the disease. African Swine Fever diagnostic personnel in both the Dominican Republic and Haiti have been studying and closely monitoring tick populations on the island of Hispaniola as potential vectors of the disease, but so far, there have been no indications that the insects have become reservoirs for the disease. Because of the swift disease control and eradication program, it is highly unlikely that they will present any problem in the future either, although studies will continue. A substantial report on the epizootiology of the disease is presented as an appendix.

Sentinel Program. The primary objective of the sentinel program is to verify the eradication of the ASF virus in Haiti, through searching for any outbreaks of the disease among a population of certified disease-free pigs posted at various locations throughout the country. This will be accomplished through introducing a prescribed number (2000) of pig gilts from countries free of ASF and major swine diseases.

PEPPADEP and IICA have selected the US and Canada as the two major sources of these 2000 sentinel pigs. The US will supply 85% of the sentinel pigs, and Canada the remaining 15%. To date two shipments of 300 pigs each have arrived in country for the sentinel program.

The sentinelization scheme is based upon a few basic requirements. In the first place, sentinel pigs will be introduced into the country only after all other pigs are thought to be eradicated. Each shipment of sentinel pigs arriving into the country is placed in a fully sanitized quarantine station for a period of 30 days. This quarantine is needed to insure (in spite of the strict import and export health requirements) that the introduced pigs are indeed healthy, and do not introduce a new disease into the country. If such a disease outbreak were to occur during the quarantine period, this would indicate that the given disease was introduced with the sentinel pigs themselves rather than having been present in the country beforehand.

After the 30-day quarantine period these pigs are placed in preselected sites throughout the country for the first 45 days of the sentinelization program. Each site receives four pigs, which are kept in a small pen with a partial roof for one week. Later, they are allowed to forage in the area around the site while still being penned at night. The feed, as well as the veterinary agents who monitor the pigs' health, are provided by PEPPADEP.

If no outbreak of disease occurs at the first site, the pigs are moved to a different site for the next 45 days and the procedure is repeated. If an ASF outbreak were to occur the immediate area would be quarantined and all pigs in the area eliminated. A waiting period of 90 days is followed before the procedure is repeated.

After the second uneventful 45-day sentinelization period, the area is declared free of ASF. Those sentinel gilts which remain from the program then become available for breeding, which is the secondary objective of the sentinel program.

Danger of reinfection. If an outbreak of the disease occurs during the sentinelization phase, only those hogs in a quarantined area around the outbreak would be destroyed, not all hogs in the country. If this does occur it would not cause a severe problem to the project, but might slow the distribution program. Distribution under the AID-funded project, however, is not scheduled to begin until the 11th month of the project, and this should be a sufficient time lag for sentinelization to be finished and the country declared ASF-free.

Success of ASF eradication. The success to date of the eradication program is largely due to the efforts of the international donors together with IICA, which serves as the implementing agency, and PEPPADEP, a temporary institution which is totally funded by the project. The eradication project required a substantial amount of investment in areas such as vehicles, maintenance, operating expenses, equipment, office space and supplies, to enable PEPPADEP to carry out its mandate as expeditiously as possible. This investment may have totaled as much as \$1 million. In addition, PEPPADEP's operating budget funded hundreds of employees throughout the country.

The balance of the PEPPADEP budget was utilized to reimburse farmers for the cost of the slaughtered pigs. The indemnification scheme was largely responsible for the success of the ASF eradication program, because the farmers were paid immediately upon sacrificing the pig while still retaining ownership of the carcass. The carcass of a slaughtered pig is fit for human consumption once it is properly cooked, but ingestion of the diseased meat by a healthy pig can cause transmission of ASF.

The indemnity schedule for the sacrificed pigs amounted to \$40.00 (US) for adult pigs, \$20.00 for junior pigs, and \$5.00 for piglets.

Complexity of a swine repopulation program. The repopulation of the Haitian pig herd to its pre-campaign status of approximately 1.2 million pigs (IDB/IICA Feasibility Study) is clearly outside the scope of any single effort, and will only be feasible given time and favorable conditions. The long-term repopulation program at the national level will require a substantial financial commitment from the GOH, involving the training of technicians and farmers, interventions in swine nutrition and health, as well as concerted efforts by private voluntary organizations and the private sector.

Use of sentinel pigs for repopulation. The principal problem with a repopulation effort based on the sentinel pigs is that there is no organization in place within the country to assist and carry out the breeding, training, and other functions necessary for an effective repopulation program; one would have to be created for that purpose. The financing and logistical support of such an organization would be substantial.

In addition, the ownership of the sentinel pigs is far from certain at this point. The logistics involved in managing a breeding program based on small units of pigs scattered throughout the country would be extremely difficult. Any attempts to regroup these pigs for breeding would face two obstacles: first, the lack of facilities with sufficient capacity to establish an effective breeding program; and second, the health hazard involved in regrouping pigs after their exposure to different sites throughout the country. The pigs will also have undergone a good deal of stress in having been moved frequently, which may reduce their fertility. The sentinel pigs may be good candidates for a repopulation program, but they should preferably be allowed to breed at the sites where they are now located.

Use of an in-country breeding center. The principal reason for choosing to multiply swine in a breeding center in Haiti rather than import the same number of pigs for direct distribution is the lack of adequate and limited swine housing facilities. It is estimated that over the life of the project approximately 4496 breeding pigs (3740 females and 756 males) will be produced for distribution to SMCs at a rate of 84 pigs per week. If this same number (4496) were to be imported for direct distribution, the cost would be prohibitive. 4500 pigs at \$350 each would cost \$1,575,000. To this figure one must add the costs of personnel, vehicles, feed, medication, and training.

Other disadvantages of importation. To import 4500 pigs would require 15 air shipments of 300 pigs per shipment. The quarantine facilities to house 300 pigs for 30 days prior to distribution do not exist in Haiti. The transportation of these many pigs from the airport to the quarantine station is an added task. To the 30 days quarantine period has to added an additional 15 days for cleaning and disinfecting the facilities. This 45-day schedule for 15 exclusive shipments would take 675 days (almost two years).

Will American Pigs Survive and Produce in Haiti? Survival of any pig, whether an improved breed or native, depends upon feed and water. Experiences in other countries where similar programs have been initiated show that American pigs will survive if treated as well as the native pig. Improved strains have been in Haiti for some time under modern production practices and have performed well (in HAMPOO, for example). The pigs introduced into the Dominican Republic following ASF eradication there have adapted and reproduced.

The HAMPCO technicians noted that the offspring of the imported pigs were well adapted to the conditions under which they were raised; adaptation to conditions improves with each succeeding generation of pigs produced and introduced to increasingly rudimentary levels of management.

Traditional pig raising by the peasant is an extensive operation with very few inputs. Pigs are tethered, and food is brought to them or they are moved periodically or allowed to roam freely to forage for food, primarily edible wastes.

PART II. PROPOSED BREEDING PROGRAM

Nucleus Breeding Center (HAMPCO). The HAMPCO facilities have the capacity to house 400 sows, 40 or 50 boars, and their offspring produced in a staggered series of breeding cycles of 20-25 farrowings per week. The facilities have been vacated for the last 18 months as a result of the ASF eradication program, and no production program can begin under HAMPCO auspices until the country is declared free of ASF, sometime in February 1984. In the meantime they are available for use by this project as the principal nucleus breeding center.

The breeding stock will be purchased under a contract with US pig producers, with close supervision by AID representatives to insure that the pigs meet the purchase and health specifications stated in Annex E. Once the breeding stock arrives in Haiti, it will be bred under modern conditions with a carefully designed health monitoring program.

After the required growth period, with proper care and management, the first group of gilts should be ready for breeding on or about week 26 of the project. The second and third group of gilts will be raised in the same manner as the first, and should begin to breed in weeks 32 and 38 respectively.

ASF at HAMPCO. The fact that ASF was discovered at the HAMPCO facility is a point of concern. However, the facility has been empty of pigs for 16-18 months. All thatched roofs were removed and burned, exposing the facilities to sunlight which does destroy the virus. PEPPADEP will clean and disinfect the facility and place sentinel pigs in the facility prior to the beginning of this project.

Feeds: Adequate feed mixing and storage facilities for the needs of the project exist at HAMPCO. The balanced diets will be formulated using feedstuffs available in Haiti, with the exception of vitamin, trace mineral, phosphorous and antibiotic additives, which will have to be imported. Wheat bran, rice bran, soybean meal, and molasses are available in country. The availability and prices of these feed ingredients are presented in Table 1.

Due to the use of wheat bran as the primary energy source, the diets will be lower in total energy than those typically fed to swine in the U.S. and performance will be reduced slightly, requiring approximately 240 days rather than 180 days for a pig to reach a market weight of 200 pounds (HAMPCO records).

Role of PI480 commodities in the project. A constant and uniform supply of feed is necessary for any swine breeding project. PI480 commodities not suitable for human use, especially dried milk products, would be useful in the formulation of lactation and baby pig diets; however, since a supply of these products cannot be guaranteed prior to initiation of the project, it is best to budget only for purchased feeds. If spoiled commodities do become available they could be used advantageously.

Management of Pigs on Arrival in Haiti. The pigs should arrive in the early evening, prior to 10 pm. Haitian time. The pigs will be loaded into rented trucks for the trip to the breeding facility. On arrival at the facility the pigs will be placed in pen with the medicated water available and one pound of feed per pig scattered on the floor. The pigs will be fed 1 to 1 1/2 lbs. each the next morning and monitored for any obvious abnormalities. Medicated water will be provided for five days and the feed per day will be gradually increased. As the gilts reach 250 pounds, the feed will be reduced to 5-6 pounds per day.

The pig production program at the HAMPCO facility will consist of three major elements:

- (1) Breeding. At six to eight months of age the breeding program will commence, with 20 gilts per week being bred. All gilts will be bred twice daily while in estrus to the appropriate breed of boar. At this time feed consumption will be limited to four or five pounds per day in two feedings. Prior to breeding, all animals will be vaccinated for Leptospirosis.
- (2) Farrowing. At the 109th day of gestation, the gilts (in 20-gilt groups) will be moved into the farrowing house. At farrowing all baby pigs will be ear notched for identification and their needle teeth will be clipped. At two or three days of age, all baby pigs will receive two milliliters of injectable iron dextran. Creep feed will be placed in all farrowing pens at one week post-farrowing for the baby pigs. Sows will be fed 8-12 pounds of feed per day.
- (3) Weaning. Pigs will be weaned at approximately four weeks of age and moved to the nursery facility. Sows will be moved back to the breeding pens. All sows will be vaccinated for Leptospirosis (5-way) at weaning.

Pigs will be fed approximately two pounds per head per day in the nursery. They will be moved from the nursery at eight weeks to the finishing pens to await distribution or to be fed out for slaughter. All mature animals will be fed 4 pounds per head per day.

TABLE 1
 QUANTITIES AND COST OF
 FEEDSTUFFS AVAILABLE IN HAITI PER YEAR^{a/}

Feedstuff	Quantity available per annum MT	Cost per metric ton ^{a/} US \$
Wheat mill feed ^{b/}	43,684	56.10
Rice bran	10,000	22.00
Molasses	14,545	33.00
Soybean meal	80,000	184.00
Cottonseed meal	462	80.00
Limestone	Unlimited	11.00

a/ Based on information available November 7, 1982.
 Source of data: IICA.

b/ Wheat mill feed is known as son de blé in Haiti.

Note: The price of corn bran in several rural markets averaged 20 centimes per marmite (about a one gallon measuring can).

TABLE 2
 AVAILABILITY OF WASTES AND AGROINDUSTRIAL BY-PRODUCTS (1977)

Ingredients	Localities	Availability (tons/year)	Cost US\$/Ton
Citrus rinds	Everywhere	18000-20000	Free
Braff (beer wastes) dry	Port-au-Prince	80-100	\$30
Brewer's yeast	Port-au-Prince	unknown	unknown
Rice bran	Artibonite Valley	25000	\$26
Wheat bran	Port-au-Prince	15000	\$45
Sunflower cake	Port Dauphin & Jacmel	unknown	unknown
Cocoa pods wet	Cap Haitien	30000	Free

Source: Mongodin, 1977.

Animal health at the NBC. The capability of the national diagnostic laboratory to survey and diagnose diseases beyond December, 1983 is open to question. Therefore the swine specialist and USAID/H project manager must always be ready to request the services of USDA/APHIS, Plum Island Diagnostic lab, and a competent swine veterinarian on a moment's notice.

Pre-arrival requirements. Before any breeding stock can be brought into the Nucleus Breeding Center, the following will need to be in place:

- (1) An official formal request will be submitted to PEPPADEP so that they may provide 15 or 20 sentinel pigs to conduct the 45-90 days sentinelization program at the HAMPOO facilities. This time lag of 45-90 days has to be taken into consideration in the purchasing and delivery of the pigs.
- (2) The lease arrangements and agreements need to be contracted and signed between HAMPOO and the contracting agents (USAID/Haiti and IICA).
- (3) Modification and Repair of Facilities: All modification and repairs initiated by HAMPOO to make the facilities ready for lease should have been completed. These include the following:

all pen fences, water lines, roofs, farrowing crates and pens, and perimeter walls should be repaired (this is already underway);

the drainage ditch that runs through the breeding facility should be diverted, and the remaining ditch filled if necessary (this has been done);

the grounds within the HAMPOO breeding unit should be sentinelized with pigs from PEPPADEP.

After the sentinelization period and removal of these pigs, the structures, pens, and buildings should be thoroughly cleaned and disinfected according to APHIS clean and disinfect procedures.

- (4) Technical personnel. The swine production specialist will need to arrive in country at least 30 days prior to the arrival of the breeding stock in order to have had time to settle in, establish communication with the Ministry of Agriculture, and to make sure importation documents are in order; to meet with PEPPADEP, to make sure that the sentinelization has taken place and the premises are free of ASF; and to assure the facilities, labor and feed are in place and ready for the arrival of the pigs.
- (5) Nucleus Breeding Center (NBC) staff: The NBC labor force must be hired and in place. The personnel must have been briefed and advised of their specific duties and responsibilities.
- (6) Vehicles. The vehicles needed for the project should have been purchased and in place by the time the pigs arrive.
- (7) Truck Rental. A temporary lease arrangement should be made for the lease of a large truck (with a 20 ft. bed) to haul the breeding stock from the airport to NBC.

- (8) Feed, Supplies, and medicines. A one-month supply of soybean meal, corn, wheat bran, vitamins, minerals and antibiotics must be in place. In addition, contracts must be initiated to guarantee feed availability for the duration of the project.

Table 3

Feed Amounts Needed On Hand When Pigs Arrive

Soybean Meal.....	5,000lbs
Corn.....	7,500lbs
Wheat Bran.....	7,500lbs
Molasses.....	1,000lbs
Vitamin Premix.....	1,000lbs
Trace Mineral Premix.....	1,000lbs
Limestone.....	1,000lbs
Dicalcium Phosphate.....	4,000lbs
ASP-250 (Cyanimde).....	1,000lbs
Salt.....	1,000lbs

1. Vitamin Premix

Specifications

Vitamin A.....	4,000,000 IU
Vitamin D.....	400,000 IU
Vitamin E.....	20,000 IU
Vitamin K.....	.4 gm
Riboflavin.....	.4 gm
Pantothenic Acid.....	20 gm
Niacin.....	30 gm
Vitamin B12.....	20 mg
Choline.....	220 gm

Carrier: add to bring total to 5 lbs.

Trace Mineral Premix

Iron - 40 gm
Zinc - 55 gm
Copper - 5.5 gm
Manganese - 11 gm

Concentration per 5 lbs. of Premix

Iodine - 0.11 gm
Selenium - 91 mg
Carrier - Add to bring total to 5 lbs

The following medicines and chemicals should also be on hand:

- (1) Pen-Strep 12 100ml bottles injectable
- (2) Tylan 200 6 100ml bottles injectable
- (3) Tetracycline, water soluble, 24 packages (available locally)
- (4) Electrolyte, Vitamin Mix, water soluble 24 packages (available locally)
- (5) One-Stroke Environ (Aseptigen)- 24 gallons concentrate
- (6) Atgard Dewormer- 1 case or sufficient quantity to deworm 500 to 1000 pigs.
- (7) Tramisol Dewormer- 1 case or sufficient quantity to deworm 500 to 1000 pigs.
- (8) Lindane 20% e.c.- 8 gallons

The following supplies will be needed for the Breeding Unit:

- (1) 10 Wheelbarrows-for feed distribution
- (2) 10 feed scoops
- (3) 6 scoop shovels
- (4) 50 pair coveralls for breeding unit personnel
- (5) 1 gross disposable plastic boots
- (6) Office Supplies
- (7) 1 Lockable 4 drawer file cabinet
- (8) 2 Desks
- (9) Telephone
- (10) Allowance for laundry facilities
- (11) Rubber Boots-2 doz.
- (12) Repair Equipment, use from HAMPOO
- (13) 500 gal. capacity spray tank and gasoline powered sprayer (PEPPADEP currently has one)

Breeding system for female gilts. A total of 420 specific pathogen free (SPF) Yorkshire purebred and/or Yorkshire crossbred gilts showing predominant Yorkshire characteristics will be purchased. Both Yorkshire purebred and crossbred are being considered so as to provide a larger selection base. These will be purchased in three equal groups of 140 and shipped to arrive in Haiti at approximately 3 1/2 to 4 months of age.

The Yorkshire breed, either purebred or crossbred, was selected for this project, based on the criteria of availability in the US, reproductive superiority when compared to other breeds of swine, a high rate of litter survival to weaning age, and a high litter weight.

Boars. A total of 32 SPF boars will be used to breed the gilts. These will be purchased in groups of eight boars, representing the following breeds: Duroc, Spotted Swine, Hampshire and Chester White. Sixteen boars will be included in the first two shipments of gilts. The boars should be five months old upon arrival in Haiti.

These four breeds of boars were selected to produce pigs with as diverse a genetic makeup as possible. All of these breeds rank high in the following performance characteristics: high average daily weight gains, high feed efficiency, high carcass value, and a high degree of muscling. Boars with a divergent genetic make up that could meet the SPF health standards are easily obtainable in the US.

Offspring. The offspring to be produced at the breeding center for distribution will represent the following crossbreeding:

<u>FEMALE</u>		<u>MALE</u>
Yorkshire	X	Spotted Swine
Yorkshire	X	Hampshire
Yorkshire	X	Chester White
Yorkshire	X	Duroc

The SMCs will receive gilts from different line crosses from the above breeding scheme. A different breed of boar will be provided to these multiplication units so as to produce a three-way cross pig that will be sold to the farmer (e.g., Yorkshire-Hampshire X Duroc).

Inbreeding. Because this is only a short-term project, there should be no problems of inbreeding at the primary breeding unit. Four breeds of boars will be imported to sire the animals to be distributed. There will thus be four "lines" of breeding animals sent out from the breeding center which can be crossed to prevent any inbreeding problems in the first few years. The sentinel pigs will also be used in their breeding program which would provide other sources of boars for use to prevent inbreeding at the farmer level. In addition, the IDB loan repopulation program should be able to supply additional breeding animals to the farmer in from three to five years.

Breeding Facilities. The management of the breeding facilities will be under the supervision of the PASA swine specialist. Access to the farm will be carefully controlled to prevent infection of the stock.

The breeding center will be managed as an efficient commercial pig production unit. The breeds of pigs chosen for the program are reknowned as among the best breeders in the world, and the proposed crossbreeding program has been designed for maximum production. It is the opinion of the livestock specialists who conducted the IICA/IDB study and those who have worked on this project design that the system proposed is a practical one for Haiti.

PART III. ESTIMATES OF PROJECT SWINE PRODUCTION

Production Estimates of the NBC. Since the nucleus breeding center will be managed as a commercial unit and under optimum conditions within the Haitian environment, the production estimates over the life of the project can be considered reliable. By using the planned breeding schedule, expected conception percentages and litter weaned size, the center can produce 3740 females and 756 males for distribution to secondary multiplication centers (SMCs) and 4104 culls that will be fattened and sent to processing facilities over the 24-month life of project.

Assumptions. The assumptions implicit in these estimates are as follows: 24 gilts will be bred per week and 20 will conceive, an 80% conception rate. These pigs will wean eight pigs per litter, of which 50% will be male and 50% female. 87.5% of the females and 17.5% of the males will be distributed. The remaining pigs will be fed for slaughter.

Beginning four months after the arrival of the first shipment of pigs, 20 to 26 females will be exposed to the boars weekly. With an 80% conception rate, 20 gilts will become pregnant each week so that by the end of the ninth month of the program 20 gilts per week will begin farrowing 8 pigs per litter, giving 160 pigs per week.

During the 11th month, 70 females and 14 males will be available for distribution to SMCs each week, with 76 pigs being retained at the unit and fed for slaughter.

By the end of the program, 62 weekly farrowings will have occurred. Sows will not be allowed to farrow after the 22nd month, since the pigs would not be old enough to distribute unless the project were allowed to run beyond the 24th month. 54 groups of 20 sow pigs will be distributed for a total of 3740 females and 756 males distributed to SMCs. By the end of the project, 4104 pigs will have been made available for sale as slaughter or feed pigs.

At the end of the two-year program, a breeding herd of 3740 females will have been distributed to the SMCs. These animals will begin to reproduce around the time of the end of the interim project.

Production Estimates at SMC and Farmer Level. The multiplication ability of the SMCs could be substantial, based on the initial 3740 breeding gilts distributed to them by the NBC. Under proper management these 3740 breeding gilts and 756 boars once at full reproductive capacity could produce 50,000 pigs per year under less than optimal conditions. Half of these pigs will be female, of which 75% or approximately 19,635 could be distributed to farmers per year from the SMCs. By utilizing 15% of the male population, approximately 3927 boars could be used for breeding. This many breeding pigs in the hands of the farmers have the potential of producing 95,000 to 98,175 pigs per year.

At the end of the two year program, a breeding herd of 3740 females and 756 males will have been distributed to the multiplication and demonstration units. These animals will be in full reproduction capacity by the end of the project. This breeding stock (3740 females and 756 males) could have the potential of producing approximately 50,000 pigs per year. With two litters per sow per year and seven pigs per litter, each sow will produce 14 pigs per

year. 14 pigs multiplied by 3740 sows equals 52,360 pigs produced by the SMCs per year.

Since half of the production will be male and half female, an equal number, or 26,180, of each sex would be available for selection, distribution, and fattening for slaughter by the SMCs. If 75% of the females (19,635) and 15% of the males (3,927) are selected for breeding stock, a total of 23,562 breeding pigs could be distributed to farmers per year. The potential productivity of these pigs (23,562) at the farmer level is difficult to predict. However, an approximate calculation could be made: If 19,635 breeding gilts are distributed to farmers each year and each sow produces one litter per year, this equals five pigs per sow per year. Five pigs per sow times 19,635 sows equals 98,175 pigs produced, a gross figure without the mortality rate considered.

This estimated production (98,175 pigs per year) by farmers could occur in year four, two years after the termination of the project. It is difficult to estimate what the mortality rate of this estimated production would be because of the many variables involved.

However, the SMC units could continue to produce at the estimated level of 50,000 pigs per year provided that the base herd of 3740 sows would be maintained. The balance of the remaining pigs will be fed for slaughter.

Productivity of sentinel pigs. The productivity of these animals will not be high, given the conditions under which they would be expected to be managed; however, they will breed and reproduce, and the sentinels would be expected to have had a production of from 7 to 10 thousand pigs (from 2,000 imported) by October of 1984. These pigs will be in the hands of small cooperative production units, community groups or individual producers at the small farmer level. It is difficult to make predictions of herd growth beyond a static herd of 10-15,000 breeding animals from the sentinels due to attrition, replacement and slaughter for consumption.

B. Social Soundness Analysis

Design Assumptions. The design of the interim swine repopulation project rests on several assumptions about the past and potential role of pigs in the rural economy. These assumptions, and their implications for project design, can be listed as follows:

- (1) Pigs constitute a primary form of savings for a majority of Haiti's poorer peasants. Their eradication, therefore, has placed an inordinate strain on the peasants' ability to save and to generate revenue from their savings. As a consequence, the values of other savings modes, land, cattle and goats, have become inflated, thereby decreasing their utility as a store of value. We are assuming, then, that the vicious cycle of rural indebtedness has taken a turn for the worse for a greater proportion of these peasants. Those peasants near the indebtedness margin have fallen below it, and those peasants previously just below that margin have now fallen far below it. The project will develop a strategy for targeting these formerly viable peasant families with the first generation of breeder gilts to be distributed at the farm level.
- (2) Swine production also provides the average Haitian peasant with an irreplaceable protein source. Since the swine have been eradicated, many peasants have paid increasing attention to their goats. But slower goat breeding rates have limited the protein return on this increased attention to goat husbandry. Furthermore, unlike pig feed, goat feed is not available in as concentrated a form. Therefore, it is more difficult to bring goat feed to the goat such that a more systematic breeding operation could be undertaken. Nevertheless, those peasants taking greater pains with goat husbandry are known to many of the local-level agricultural development agencies identified, by this project design effort (see Annex K), for managing secondary swine multiplication, and thus can be readily targeted as tertiary swine breeders. A further indication of this unmet protein need, and the failure of goats to fill it, is the recent spread of rabbit husbandry in rural Haiti. Like pigs, rabbits multiply rapidly.
- (3) The Haitian peasant who depended mostly on the now eradicated pig for savings, revenue and protein can be identified and animated for improved swine husbandry by a sufficient number of locally operating agricultural development agents (PVO, government, and private sector). This project design effort has undertaken a preliminary identification of these agents (Annex K) and analysis of their agricultural development record with this target population. It has been found that there are enough of these organizations, distributed throughout rural Haiti, that can at the same time:
 - 1) reach the target categories of Haitian farmers;
 - 2) manage secondary swine multiplication; and
 - 3) recover their costs without having to favor richer rural citizens.
- (4) The poorer Haitian peasant, who depended most heavily on the now eradicated pig, can still generate the labor, feed, and veterinary inputs necessary to ensure successful husbandry of this project's exotic swine breeds. The economic analysis has found the opportunity cost of the labor

necessary for this improved husbandry to be quite low. This social analysis examines, based on pre-eradication data on peasants' swine husbandry practices, the costs of this and the other inputs to the household budgets of the target farm family. The socioeconomic benefits of these costs are found to be sufficient as to justify (from the point of view of the peasant's own, sociologically analyzed, economic horizons) the input expenditures. In short, such was and such will be the value of swine breeding to this strata of Haiti's peasants that should it require more factor inputs than in the past, this level of the peasant economy will be induced to generate them.

Piggy Banking in Rural Haiti. Metraux's classic 1951 description of Making a Living in the Marbial Valley captures the significance of livestock's contribution to Haiti's rural economy:

The raising of livestock in Marbial is on a small scale, but it is nonetheless one of the main stays of the local economy, to which it gives a certain stability. It is the only activity which makes up, to some extent, for the increasingly low productivity of the soil. During the dry season every year many farmers who have come to the end of their reserves too soon, or who have no money to buy the seeds they need, are saved from starvation or ruin by the sale of their cattle or smaller livestock...

A peasant can lay out his earnings to advantage by the successive purchase and sale of livestock until the time comes when he finally converts this capital back into money to meet some unexpected charge...Many of the people...will go without food or will borrow, even at exorbitant rates of interest, in order to buy food rather than touch the savings needed for the purchase of a cow, pig or goat...

For the peasant, therefore, livestock is equivalent to a savings bank deposit or, perhaps, to an investment which can be quickly and easily converted into ready cash. The ideas of interest and of livestock are so closely associated in the peasant's mind that he almost always uses the word létééré when speaking of his animals and their young (1951:94).

In this vein, Alex Bellande (1982:45) notes how livestock accounts for 56% of a more prosperous peasant's income, and for 99% of a poorer peasant's income.

In analyzing the livestock inventory done as part of the 1950 Census, Clarence Zuvekas Jr. (1978:41) adopts the following assumptions:

It is widely agreed that Haitian farmers hold their savings principally in the form of livestock...The cattle and swine figures are probably the most significant for providing evidence of rural savings, and lend support to the belief that the Northwest is Haiti's poorest Department.

This inventory shows, however, that what the Northwest may lack in swine it makes up in goats and sheep:

Table 3.1

	<u>Livestock per Household</u>				
	<u>NW</u>	<u>North</u>	<u>Artib.</u>	<u>West</u>	<u>South</u>
Cows	.40	.59	.48	.40	.66
Heifers	.16	.25	.24	.84	.30
Calves & Bulls	.12	.23	.21	.16	.24
Sheep	.34	.10	.10	.03	.09
Goats	3.25	1.12	1.70	1.26	1.72
Swine	1.14	1.74	7.33	1.92	2.03
Poultry	5.96	6.47	8.01	4.98	7.44

This distribution of livestock shows how investment in another species increases where that in a more productive species, e.g. swine, cannot be sustained. Thus an attempt is made to substitute for swine, when necessary, in order to equalize the savings and investment function of livestock generally across the peasant sector. Zuvekas correctly argues, however, that where pig production cannot absorb enough of the savings, rural incomes go down. Goats and sheep do not breed as rapidly as pigs.

Swine Production Strategies. The limits on pig production are feed availability and the incidence of disease. Both of these factors constrain pig production as the swine population increases. For the life of the proposed interim project, the pig population will be too low for either feed to be scarce or for disease to spread quickly. Therefore, the project should have an immediate and dramatic impact of these peasants' savings opportunity structure.

Bellande distinguishes between three different economic levels as manifested by the different uses of livestock for financial security at each. At the lowest level, where the animals are owned by others but entrusted in "gardiennage", the peasant has the least control of what gets sold when. Therefore, he cannot hold out for the return on his livestock by borrowing from other sources as is possible at the middle level:

Les boeufs et les cochons adultes seront donc maintenus sur l'exploitation tant que la vente de produits végétaux et les emprunts suffiront pour couvrir ses dépenses et tant que les produits végétaux permettront de rembourser par tranches les emprunts importants contractés avec garantie sur le bétail. Les transactions sur les caprins, bétail de plus faible valeur unitaire, sont plus fréquentes.

(Cattle and adult pigs will thus be raised on the farm as long as the sale of agricultural produce and borrowed funds will be sufficient for covering expenses, and as long as the agricultural produce allows the farmer to repay his larger loans, using the herd as collateral. Transactions

involving goats, which have a lower unit cost, are more frequent.)

At the higher economic level:

L'élevage perd sa fonction sécurité celle-ci étant assurée d'abord par les revenus de la menuiserie et de la spéculation. Le bétail constitue plutôt pour elle un relais d'accumulation, un capital dont le but final est l'investissement dans le foncier. Une tendance vers la spéculation se dessine ici, l'exploitant préférant ne garder sur l'exploitation que des mâles destinés à l'engraissement. Les bêtes passent rarement plus de deux ans sur l'exploitation après quoi elles sont vendues. La reproduction du cheptel est assurée par des agriculteurs plus pauvres à qui l'exploitant cède des femelles en gardiennage (1981:31).

(Livestock loses its financial security function, security being assured first by income from woodworking and speculation. For these persons, livestock is a means of accumulation, a form of capital employed with the final goal of investment in real estate. A tendency toward speculation is more likely at this level, with the farmer wishing only to keep only males on the farm for fattening. These animals are rarely kept more than two years on the farm before being sold. Poorer farmers look after the reproduction of the herd, a task ceded to them by the richer farmer.)

The Interim Swine Repopulation project is not targeted at this higher level. If a peasant at this level cannot be identified by the size of his land holdings, the higher proportion of males being held in his livestock herd will give him away. The savings-oriented peasant (middle level) and the peasant engaged in gardiennage (lowest level) can be recognized by the higher proportion of females under their care.

Swine Income. Jean-Marie Devillard (1981:6) takes from 'Methodologie des Comptes National d'Haiti (1975-6)' 6.4% as an estimate of swine's average contribution to household income, the highest percentage contribution of any single commodity. The same figures (1981:7) show swine contributing 44% of the income earned from livestock, over four times that earned from any other animal, other than cattle, and still more than 25% over that bovine contribution. Devillard's own field investigations* revealed an even wider discrepancy: 55-68% for sows and 22-26% for cows (1981:8).

Even so, as we have seen from Table 1 above, the distribution of that cattle income is not as widespread as swine income. Metraux's 1951 (pp. 185-186) figures from the Marbial valley show swine ownership to be more universal than cattle ownership. 38 families owned 82 oxen, whereas 58 families owned 203 pigs. Only 55 families were "supplied" (owned or entrusted through gardiennage, a shared output arrangement) with a total of 109 oxen, while 92 families were not so supplied. For pigs these figures are reversed. 92 families are supplied with 263 pigs, only 55 are not. Even when not owned, pigs are more easily entrusted than cattle: 60 out of 263 pigs are "kept" in this way while only 27 out of 109 oxen are so kept. We have seen that goats do not provide the same savings possibilities as cattle or pigs. Nevertheless, in Marbial, they are numerous. Even though goats are proverbially easy and inexpensive to maintain, their distribution is not as widespread as that of pigs. First of

* It also should be remembered that by the time (1980) of Devillard's field work African Swine fever had been at large in Haiti for two years.

all, there is less entrustment of goats to families that do not own as many as they could handle. Of 249 goats only 54 are kept. Only 71 families are thus "supplied" with goats, and 76 families are not.

Métraux also found that while 68 of the 101 small landowners were not "supplied" with cattle only, 46 of them were not supplied with pigs. At the same time 60 of these small landowners were not supplied with goats. This wider pig distribution was still possible even though 119 out of the 263 pigs were owned and kept by the larger landowners. These wealthier families also owned the same proportion of goats (91 out of 149) but the remainder of the population was not as well supplied with goats as they were with pigs. In spite of this abundance of swine they sold, in Métraux's time, for twice the weight value of cattle (1951:95). Devillard also found, in 1980, pork to be twice as expensive as beef.

Métraux carefully recorded several peasant household budgets in this 1951 study. In those budgets pig sales alone account of 7%-10% of total annual receipts. In one of three such budgets recorded by Bellande (1982:43), pig sales accounted for 27% of total receipts.

Swine Production Inputs. It should be noted that compounding the benefits of this revenue are the lack of any major expenditures to produce it:

L'élevage du porc créole est parfaitement intégré au système traditionnel puisqu'il valorise, à coût nul, et avec peu de travail, les sous produits de fruits et tubercules qui, sans lui, seraient perdus. Le porc est élevé au piquet, extensivement (consommation d'herbe et de quelques déchets de culture) jusqu'à ce que le paysan prenne la décision de l'engraisser. Le seul travail consiste à déplacer le piquet où le porc est attaché (15 minutes par jour) et à lui apporter de la nourriture, pendant la période d'engraissement. L'engraissement, réalisé à partir de fruits (mangues etc.) de tubercules, de sous produits de culture et de déchets de cuisine est fait sur une période de 4 à 9 mois. Un système d'engraissement porcin traditionnel a peut être une efficacité technique faible, mais il fonctionne, sans aucun appui technique de l'extérieur, et s'accommode de bas niveau technique des paysans (Devillard 1981:66).

(The raising of creole pigs is integrated perfectly into the traditional system; it permits the use of agricultural byproducts of fruits and root crops, without which these would be wasted. The pig is tethered to a post, raised extensively (eating grasses and some agricultural wastes) until the peasant decides to fatten it. The only work involved is in moving the post to which the pig is attached (15 minutes per day) and bringing it food, during the fattening period. Fattening, done with fruits such as mangoes, roots, agricultural wastes and kitchen wastes, lasts for from four to nine months. Such a fattening system may not be technically sophisticated, but it works, and works without any external inputs, and is thus perfectly integrated into the peasant's level of technology.)

Métraux (1951:98) would seem to disagree. But when we consider the opportunity costs of the time spent on traditional swine production, his findings do not appear so different:

The rearing of pigs is quite an expensive business. Their food consists not only of household waste and grass, but also of the seeds of the cabbage-plant, mangoes, avocado pears, boiled bananas and maize. The increasing poverty of the peasants enables them less and less to engage systematically in pig-breeding. During the 1948 famine these animals grew terribly thin and were left to look for their own food. A few peasants hand over their pigs to "swagnè" (animal-tenders) to whom they pay ten gourdes a month. The latter are supposed to return them, double the weight, at the end of three months" (1951:98)

This paragraph suggests, as to the above cited pig vs. total livestock proportions, that the return on swine justifies these time and feed expenses.

Bellande's study enables us to be more precise about the real cost and benefits of pre-eradication swine husbandry. In comparison with cattle,

Les porcs sont mis au pâturage également mais ne paissent que le Sida Acuta (bale) et le Boreria Laevis (koupé kolom) plus dispersés, ils reçoivent des apports plus fréquents de fanes de patate et de déchets de cuisine (1982:16).

(Pigs are also raised on the pasture but only eat the more widespread Sida acuta (bale) and Boreria laevis (koupé kolom), and are frequently brought sweet-potato leaves and kitchen wastes.)

Notwithstanding this extra effort on behalf of the pigs, they are taken to water much less frequently than the cattle: no more than once every two weeks as opposed to once every two days for cattle. But at the lower altitudes, where there is more standing water, pigs are quite capable of finding sufficient moisture on their own. And it is at these lower altitudes that scavenger feed can be found for pigs year round and by the pig itself:

L'accès aux terres situées dans les zones de basse altitude est un des principaux facteurs de différenciation des systèmes d'élevage porcin. Ce sont en effet ces jardins qui fournissent tout au long de l'année le flux continu de fruits, de pelures et de sons de céréales utilisés pour l'alimentation des porcs: fruits à pain, graines de palmiste, sons de sorgho et de maïs, feuilles de malanga, mangues, avocats (1982:33).

(Access to land located in areas of low altitude is one of the principal causes of differentiation between systems of pork raising. It is these gardens which furnish a continuous stream of fruits, peels and grain husks used to feed the pigs: breadfruit, palm nuts, sorghum and maize husks, malanga leaves, mangoes and avocados.)

But it is also the variety of altitudes and, therefore, of microecologies available to the farmer within such a short distance that really makes Haiti such ideal swine country:

La diversité des zones écologiques auxquelles ont accès les exploitations et l'étendue de la gamme des espèces cultivées déterminent donc des calendriers fourragers particuliers à chacune d'entre elles (Ibid.).

(The diversity of ecological zones to which the peasants have access and the extent of the variety of cultivated species there determine the forage calendars for each of them.)

Yet all of this variety and abundance requires a sustained labor input in order for it to pay off in pork:

La quantité de produits et sous-produits en provenance des zones basses qui seront disponibles pour l'élevage porcin dépendra d'autre part de la quantité de main-d'oeuvre qui pourra être mobilisée pour la récolte de ces produits, ces jardins étant généralement situés à plus de 45 minutes de marche du lieu d'habitation (Ibid.).

(The quantity of products and wastes coming from lower areas and available for pork raising will also depend on the amount of manpower usable for the harvest of these products, since these gardens are generally located at a 45-minute walk from the household.)

The Socioeconomic Structure of Swine Production Systems. Of Bellande's three economic levels of pig producer, then, there is a further differentiation by the pattern of pig feed available to each. At the middle level there seems to be a low cost, labor extensive symbiosis between the annual swine feeding cycle and the rest of the farming system:

Ses déplacements plus fréquents vers les terres noires pour des travaux culturaux ou pour la récolte des fruits à pain font que la ration de ses porcs intègre beaucoup plus de produits de ces zones...Ceci lui permet, entre les mois d'octobre et février, de compléter par des fruits entiers ou des pelures (avocat, fruit à pain) une ration insuffisante en fanes de patate résultant de la relative faiblesse des surfaces plantées en patate en juin et juillet. Les feuilles de malanga et les mangues sont introduites dans la ration à des moments de l'année où les fanes de patate et les fruits à pain ne sont disponibles qu'en faibles quantités (février à mai).

(His more frequent trips toward blacker soils for cultivation or for harvesting breadfruit means that the diet of his pigs will include more of the foods from these zones...This means that in October he can supplement the inadequate diet of sweet-potato leaves (caused by having planted too small an area in this crop in June and July) with whole fruits or the peelings of avocados and breadfruit. Malanga leaves and mangoes are introduced into the diet when sweet-potato leaves and fruits are only available in limited quantities, from February to May.)

At the highest level, however, a more labor-intensive operation can be sustained:

(on) fait appel à de la main-d'oeuvre externe pour valoriser la production fruitière des zones basses. La récolte de ces produits est confiée à l'exploitant (at the lowest level) qui reçoit en échange de son travail quelques fruits et l'accès à certains services (eau de citerne, prêts sans intérêt en argent, repas occasionnels). Une autre stratégie consiste à transférer un porc chez un beau-frère habitant les terres noires pendant deux ou trois semaines en période de pleine production de fruit à pain. Celui-ci se charge alors de nourrir le porc à partir de la production des

jardins de l'exploitation (of the highest level)...

(External manpower is called upon to increase fruit production in lower areas. The poorer peasant harvests these products, and receives access to certain services in return--water from the cistern, interest-free loans, and occasional meals. Another strategy consists of transferring a pig to a brother-in-law who lives on the blacker soils during two or three weeks during the period of breadfruit production. The brother-in-law has the responsibility of feeding the pig with the fruits of the richer farmer's garden...)

D'autre part, les grandes surfaces plantées en patate entre février et juillet sur l'exploitation (of the highest level) permettent de disposer de fanes de patate des le mois d'août et jusqu'en début février. La période durant laquelle les porcs sont alimentés en fanes de patate est donc plus longue que sur les (autres) exploitations (1982:34).

(On the other hand, the large areas planted in sweet potatoes between February and July on the farmer's land give them access to sweet-potato leaves during August and into the beginning of February. The period during which the pigs eat sweet-potato leaves is therefore longer than on other farms.)

Thus, though the institution of gardiennage, the higher socio-economic strata can profit from the labor of a select few from the lower socio-economic strata so that the pigs managed at both levels (though not yet owned at the lower level) can eat well throughout the year. The pigs of the independent middle level must always go without at certain times of the year--a fact which may knock these peasants back into the lower strata and, thus, into gardiennage dependence on the higher stratum peasant. But, as we have seen, a gardiennage relation with these higher level peasants gives the participant access to more pig feed throughout the year, and, thus, around back to the middle level.

Hence there appears to be somewhat of a vicious cycle involving a circular rotation between failing middle-level peasants and successful lower level peasants, with neither penetrating the ranks of the higher level. At the latter level,

Le fait...de pouvoir disposer de fanes de patate jusqu'en février lui donne également la possibilité d'entreprendre la finition des porcs en contre-saison quand les prix de la viande sont plus élevés. L'exploitant peut alors investir dans son porc en mars quand les prix atteignent plus de 5 gourdes le kg. (1982:35).

(This access to sweet-potato leaves into February gives him the ability to fatten pigs in the off-season when the price of pork is higher. The farmer can therefore invest in his pig in March when the prices rise above five Gourdes per kilogram.)

Our project does not seek to discourage this semi-commercial orientation by directing its pigs below this higher economic level. On the contrary, our project seeks to give the middle and lowest levels a head start toward this commercial orientation. It was at these lowest economic levels that, in spite of their owning fewer pigs, peasants were more dependent on pigs for their

survival and, therefore, have suffered most from the eradication.

Of course, not all of the lowest level peasants benefit, through gardiennage and/or salaried relationships with the highest level, from the range and duration of feed available to that strata. Most of them cannot get any access to lower altitude farms for any purpose, leaving their pigs

Alimenté(s) surtout à partir de sous-produits de la culture de la patate et du maïs. Par conséquent, avec une surface en association comprenant de la partie légèrement inférieure à celle de l'exploitation (of the higher level) elle n'arrive à nourrir qu'un seul porc alors que l'exploitation (of the higher level), grâce aux apports supplémentaires en provenance des zones basses et à une quantité plus importante de pelures (igname, banane, avocats, mangues produits ou achetés), nourrit un cheptel porcin comprenant au minimum un porc de plus de 20 kgs. et deux jeunes porcs (Ibid).

(fed mostly with sweet potato and maize byproducts. Therefore, with a farm only slightly smaller than that of the richer farmer, the poorer farmer is able to raise only one pig, whereas the richer farmer feeds a herd consisting of a minimum of one 20-kilogram pig and two young pigs. This is possible because of the supplemental feedstuffs and fruit peels to which he has access from the lower areas--yams, bananas, avocados, and purchased or produced mangoes.)

Thus unlike pig raisers from the higher two strata, the poorer peasant is obliged to buy sweet potato vines. But such is the value of pig production to him, that he is quite willing to plunge deeper into debt for this purpose:

(Ces) fanes peuvent être payées en espèces quand le gérant des parcelles prises en métayage exige le paiement des droits de pâturage ou encore payés en travail car, pour pouvoir prolonger la période durant laquelle son porc est alimenté en fanes de patates, l'exploitant est amené à consommer une partie de ses réserves de boutures; il est donc fréquemment obligé "d'emprunter" des boutures au moment de la plantation, autre service qu'il devra à un moment donné payer en travail.

((these) leaves can be purchased for cash when the landowner requests payment for grazing rights; they may also be paid for by work, since while the farmer is feeding his pig sweet-potato leaves, he is also eating a portion of his seed potatoes. He is therefore frequently obliged to "borrow" some seed potatoes at planting time, another service which he will owe and will pay off by working.)

Après épuisement des fanes de patate en début janvier (son) porc se nourrit jusqu'en fin mars uniquement d'aventices paturées dans les jardins autour de la maison de l'exploitant et d'aventices hautes (zequi, chicorée, moutarde) que l'exploitant récolte dans d'autres jardins (Ibid.).

(Once the supply of leaves is finished in early January, his pig eats only crops found around the farmer's house and higher-quality forage (zequi, chickory and mustard) which the farmer harvests in other fields.)

Meanwhile (January-March) at the higher two economic levels pigs are getting maize and sorghum bran, xanthosoma leaves, kitchen garbage, and are able to root around in partially harvested sweet potato fields. At these levels, "la periode durant laquelle les porcs se nourrissent exclusivement d'adventice ne dépasse pas trois semaines" (1982:36).

Three weeks a year of skimpy feed, instead of three months, leave peasants at the middle and higher levels in a better position to use pigs to break out of debt. But, as we have seen, the higher strata peasants, by virtue of the fact that they own more low altitude land, are significantly better endowed with pig feed. And, if with anyone, it is only with a few of the poorer peasants, who come in as gardiens or laborers, that they may share this abundance. Thus, its advantages are not accessed by any middle level peasants who might, thereby, break into the higher strata.

It would be a significant achievement if this project could help break this lack of upward mobility into the highest economic strata of peasants. Even if it cannot, it is still justified in targeting its breeder pigs on the middle and lower strata, in spite the greater cost of feed to those peasants, because there, in contrast to what happens at the higher level, pigs are fattened more exclusively for breeding rather than for slaughter.

Pre-Eradication Pork Consumption in Rural Haiti. The National Nutrition Survey of 1978 concludes its introduction (p.3) with this statement:

Other workers have reported deficiencies in vitamin A, riboflavin, and in folic acid, but the magnitude of these deficiencies does not approach the protein energy deficit reflected in the reported nutritional status of Haitian children.

The questions to be answered for the project, then, are: (1) What was the role of the now absent pork in mitigating this deficiency? and (2) To what extent would an improved swine husbandry further ameliorate the protein scarcity problem in rural Haiti?

Alvarez and Murray have given us one Haitian village's ranking of the desirability of the differences in their vyann food group:

Pork is assigned a generally low nutritional value in the village. The scavenging habits of the pig, and its tendency to eat garbage and other unclean items, constitute one factor in the perceived inferiority of its meat, in contrast to that of the two more highly valued ruminants. The recent epidemic of African Swine Fever has merely added to village perceptions of the "dangers" inherent in pork. As a post partem food we have seen that pork is viewed as being of little value to the woman. Some villagers would go further and say that it is dangerous for the woman and should not be eaten until three months after delivery. And then it should be eaten only in a dry, well-cooked griot form by itself, rather than being cooked by simmering in liquid sauces, as is true of other meats. That is, one behavioral effect of the low nutritional value and health hazards which village tradition assigns to pork is to create tighter cooking constraints, an attitude that is well in line with modern medical advice as well.

This differential ranking of meats, it could be added, is also carried over to the religious sphere. The folk religion of the village ("voodoo") involves frequent sacrifices of animals. The world of the local spirits is divided into two groups: gentle spirits ("sweet loua") and violent spirits ("bitter loua"). The most gentle and "lightest" of the spirits have a preference for the meat of white chickens and pigeons. Pork, in contrast, is fed only to the violent spirits. But the strict confinement of pork to the violent "bitter" group merely gives ritual manifestation to a dislike and fear of pork that is part of the more general food preference system (1981:161-2).

There are three ways of interpreting this cultural information:

- (1) Nutritional preferences are being used to rationalize economically obligatory choices: those meats that command a higher market value (beef, pork, and mutton) are conveniently given less cultural reinforcement in village ideology. In that belief system the cheaper meats (goat and chicken) are thought to be better.
- (2) Yet, unlike beef and mutton, pork most frequently in griot form is consumed in the village, at both secular and sacred occasions. In fact, on account (until recently) of its greater availability, it may be consumed more frequently than goat or chicken, both considered to be more desirable. Being more abundant, pork may be less valued culturally. At the same time, commanding a relatively high market value, its nutritional value might be further disparaged in order to ensure the generation of much needed cash.
- (3) Mutton is the only common vyann considered worse than pork. Mutton's unpopularity can explain the scarcity of sheep in many parts of Haiti (see table 1). Yet pork's unpopularity seems to have had nearly the opposite effect. There were more pigs, by weight, in these villages than any other livestock species. Thus, while one could say that familiarity bred contempt in the case of pork, relative to the other vyann, familiarity did not breed contempt in the case of the cheaper meats, goat and chicken, and scarcity did not breed love in the case of beef or mutton.

What is clear is that this cultural maze, while it may have encouraged the marketing of pork, did not discourage pork production. Nor did it, in spite of the commercial value of pork, discourage pork consumption.

Devillard (1981:6) interprets the Méthodologie des comptes Nationaux d'Haiti 1975-6 to indicate that approximately 2% of the commercial value consumed on the Haitian farm was derived from swine. This 2% was 32.6% of the commercial value of the animal products (vyann) consumed (1981:7). Bellande found that at least one full pig a year per family was consumed at the higher and middle strata of his peasant sample (1982:49). Presumably those with whom this pig was shared would share their pig through the same social networks when it was slaughtered.

One tentative conclusion, then, is that the absence of pigs has had both a direct and indirect, in terms of lost revenue, adverse impact on protein consumption in rural Haiti.

Swine Repopulation and The Auto-Consumption of Pork. It is fair to assume that little pork, beyond the normal cull rate, will be eaten at the farm level until Haiti is nearly fully repopulated with swine. However, as the economic analysis shows, this may not take too long.

Meanwhile, the revenue obtained from the sale of breeder gilts will significantly increase these peasants' ability to purchase protein alternatives.

Reaching the Right Peasants. The income, employment and nutritional urgency of swine repopulation has thus far been established. Three economic strata in the peasant sector have been identified. Several arguments for targeting this project's F₂ breeder gilts on the middle and lower strata have been put forward:

- (1) These two strata lost a greater proportion of their total income on account of the eradication and, therefore by rights, they should be given the first opportunity to recover.
- (2) In pre-eradication times these lower strata, with few other savings alternatives, displayed a preference for a breeding swine husbandry as opposed to a fattening-for-slaughter orientation. What these poorer peasants may have lost, at times, in cash income, as a result of this breeding strategy, they may have gained in savings security. In any case their breeding orientation will facilitate rapid repopulation more than the quick cash-turnover orientation of the higher strata peasant's culling strategy.

It might be argued that, in the initial phases of repopulation, a breeder gilt will command a significantly better price than its mere slaughter weight and, therefore, the higher strata of peasants will also adopt, for the short term, a breeding oriented swine husbandry strategy. It is the conclusion of the economic analysis that this short term will be too short. In other words, the slaughter value of pigs will catch up with their breeding value long before Haiti is fully repopulated with pigs. At this point the wealthier, pig owning peasants will quickly relinquish any breeding orientation they may have temporarily adopted and it will become harder to get breeding pigs.

The only peasants, at that point, who will want gilts for breeding, the middle and lower strata, will not be able, since they would continue to be without swine revenue, to buy them. Thus, Haiti's swine population would stabilize in accordance with the urban demand for pork, not the peasants' demand for a savings mechanism. Repopulation would thus have stopped of its own accord, well below pre-eradication levels.

- (3) On account of the greater importance of swine husbandry to the middle and lower stratum peasants, and on account of the lower opportunity cost of their labor, they will be more inclined to adopt swine husbandry innovations when, as with this project, they have access to breeds that can respond (unlike the pre-eradication cochon planche) to higher input levels.

It might be argued that the higher-stratum peasants, having access to more lower altitude land, could more easily feed the new pigs so that they could reproduce at a more rapid rate. However, the technical analysis has shown that the improved breeds to be introduced by this project will require daily labor inputs as well as steady feed. Hiring this labor on the market, the alternative for the higher-stratum peasant, will be more costly to the swine husbandry enterprise than would the use of low opportunity cost labor from, and for, a poorer peasant farm.

There is a further consideration which makes it imperative that this project target the middle- to lower-level peasantry with its pig distribution plan. Although the reasons for swine eradication, thanks to PEPPADEP's effective communication program, seem to have been well understood among the Haitian population at large, it was still not a popular program.

The way in which those same United States bring pigs back into Haiti is being closely watched. This program supported, in part, by the US has had a significant impact upon the lives of Haiti's peasants. Therefore, the attention of the Haitian peasant has been, perforce, drawn to the pig question. The pigs are gone now. The United States helped to kill them. Who is going to bring them back? The United States? That is only fair, but who is going to get them? Whom is the United States in Haiti to help first? There is no underestimating the visibility of this repopulation project. The public relations impact of how this project's breeder gilts are distributed will be considerable. What follows is a consideration of several alternative distribution plans and a brief discussion of the alternative chosen for this project design. This choice is then placed in a project implementation context in the Institutional Analysis.

Alternative Pig Distribution Plans. The PID listed four alternatives for distribution from the nucleus breeding facility that would be considered by the project paper design team: (1) through PVOs; (2) directly to peasants by means of rural credit; (3) through the GOH; and (4) by lottery.

The first alternative is the one that has been chosen. The technical and economic analyses demonstrate the value of withholding breeding sows from direct distribution to the peasant for at least two generations. In other words, by keeping sows back in a breeding facility, more pigs ultimately can be distributed. A sow kept in a piggery produces more offspring, more regularly than at the peasant farm level. By establishing enough of these piggeries, the production of a steady flow of piglets for the repopulation of Haiti can be assured. Thus, as calculated by the economic analysis, from a base of 452 imported pigs, Haiti could have more than its pre-ASF swine population in less than 10 years. This assumes, of course, that a good rate of reproduction will occur at secondary multiplication centers (SMCs), or intermediate farrowing barns, and not just at the peasant farm level.

The 2,000 sentinel pigs that will be in Haiti by the end of this calendar year will be placed on peasant farms. The costs of reassembling them for systematic breeding exceed those of bringing in new pigs. Furthermore, a gilt produced from the U.S. according to certain specification makes better breeding stock than one that has spent 6 months to 6 weeks out in the countryside, where: (1) uneven nutrition may have reduced breeding capacity; (2) a greater variety of diseases can be picked up; and (3) other aspects of each of the pigs' different adaptations to different microecological

environments will prove incompatible. Precisely to avoid these problems, the swine procurement specifications for this project stipulate that each lot of pigs procured should come from the same farm.

Once the determination to insist on a series of secondary multiplication facilities as part of the swine distribution process was made, two questions remained: (1) Who would finance, build, and manage them? and (2) How would the project managers ensure, if they were not to distribute gilts directly to peasants themselves, that the pigs would be distributed equitably? When the pigs passed beyond the project managers' direct control, they would be at the secondary multiplication centers not with the target population to Haitian peasants.

Based on several field visits, and extensive interviews, the project design team has developed a preliminary list of private voluntary organizations (PVOs) that meet the following three criteria:

- (1) a willingness to construct, by summer 1984, at their own expense, a farrowing barn (secondary multiplication center), for no fewer than 10 breeder sows, that will conform to project technical specifications;
- (2) the demonstrated technical and managerial capability to operate and manage this farrowing barn for swine multiplication and as a swine husbandry demonstration site; and
- (3) a pig distribution plan that enables the proper peasants to participate.

PVOs with a reputation for successful work in the agricultural sector were contacted. Based on information obtained directly from them, as well as from third party opinions, a determination as to their ability to reach the poorer Haitian peasant was made. Then anywhere from one to five PVOs from each of Haiti's 20 agricultural districts were listed. In some cases, more were listed for those districts better suited to pig production (e.g., Cap Haitien, St. Marc, and Les Cayes). The list is attached as Annex K. The listed organizations will be invited by the project to submit proposals for a farrowing barn design and a piglet distribution plan. These proposals should be received by the end of this calendar year. Based on these proposals, certain PVOs will be guaranteed a certain percentage, based on their proposed farrowing barn capacity, of the breeder gilt production from the nucleus breeding center. The three criteria for choosing the PVOs are listed above. Prominent among them is the stipulation that they have a financial plan against which they will be evaluated by the IICA project management. The plan will cover not only the proposed farrowing barn and the inputs necessary to make it function, but also the PVO's ability to reach the middle- to lower-level peasant anxious to breed pigs. All of the PVOs listed in Annex K have a history of having reached the lower economic levels of Haiti's peasantry with agricultural development activities and consequently have established the necessary extension networks with the local population. The project management staff will consider several options for ensuring that the PVOs chosen to receive pigs will distribute enough of them to these lower economic levels.

The cash-flow scheme at the SMC level will not be prescribed by the project management staff, although AID may take certain actions to make the distribution scheme more efficient. Three of the options available are the following:

- (1) Holding down to below \$50 the price per gilt that the PVO may ask of the participating farmer. This option, however, runs the risk of placing the difference between \$50 and the market value for a gilt in the speculating farmer's rather than in the PVO's hands. Yet it has already been noted that the middle to lower levels of the peasantry in spite of their greater poverty, are less likely to speculate in this fashion than the higher levels.
- (2) Reimbursement in pigs or in labor these poorer farmers may have contributed, up to six months to a year previously, to the construction of a farrowing barn.
- (3) AID may also choose to press for facilitating BCA loans for the purchase of the piglets from the PVO.

Whatever option is finally chosen, project management will be attempting to ensure that the PVO managers of these secondary multiplication centers will recover their costs only and not make a profit off of the pigs received from the project.

The project design predicts that the majority of the SMCs will be set up and managed by PVOs, but it does not exclude the participation of a GOH district agricultural facility, should it make the same kind of proposal and meet the same criteria. It is genuinely hoped that this will be the case, as the PVOs receiving pigs will be dependent upon the expertise of the GOH district agronomist once the AID-funded project is completed. It would be advantageous if these district agronomist also bred pigs under the same project, as this would greatly facilitate their technical relationships with the local PVO-run SMCs. It is likely, however, that the existing GOH animal production facilities will be filled to capacity by whatever sentinel pigs can be retrieved by DARNDR'S Projet National de Repeuplement Porcin (PNRP) for systematic breeding.

The three other alternative distribution plans were rejected by the project design committee because they do not provide for the secondary multiplication stage. This stage, as we have seen, ensures that gilts can be distributed, not just once, but continually to Haitian farmers. Each of these three alternatives has other drawbacks as well:

- (1) Direct distribution through rural credit places an awkward burden on the central project administration. That administration would have to attempt, from the center, to identify those peasants best suited for and most deserving of credit and, therefore, of pigs.

- (2) Distribution through the GOH network of District agricultural offices would place a financial and administrative strain on the Haitian public sector which it can ill afford at a time when the GOH is seeking to meet its IMF targets for public expenditures.

- (3) A well-administered lottery has the advantages of being perceived, in Haitian cultural terms, as indisputably fair and equitable. But to administer it equitably would impose a massive transportation, scheduling, and logistical burden on central project management. It also has offers no opportunity to guide or orient the farmer in the care and feeding of the pig.

C. Institutional Analysis

Introduction: The social soundness analysis identified those categories of Haitian peasants towards whom this project will be targeted. It concluded by outlining how the SMC approach (an option chosen primarily for technical reasons) can be administered so that the identified target group could gain access to breeder pigs. This institutional analysis describes the SMC-to-farmer relationships in detail, and outlines how the farmers, the SMCs, and the central project administration will work together.

The analysis begins with a discussion of the central project administration and then works out, through the pig distribution networks, to the SMCs and then, with the second generation piglets, to the peasant farm level.

Choice of IICA as cooperating institution. The project has two components: the production and distribution of pigs, in as efficient and equitable a manner as possible. The design team has not recommended that the project set up a separate implementation team, but has seen the advantage in utilizing an existing organization. There are advantages and drawbacks to both approaches:

A separate team would be unencumbered by existing institutional affiliations, and, therefore, one could argue, would be better able to organize its activities around a single purpose. Such a team would be difficult to compose quickly, however, and would suffer from a lack of experience in dealing with Haitian realities. It may be, in fact, that ties to indigenous organizations are what is needed to implement the project quickly and effectively.

It is less expensive to the project to ask existing agricultural development structures to take on this emergency task. However, those structures have existing responsibilities and affiliations which, at times, could assume greater priority for them, and thus distract them from implementing this project on schedule.

Under normal circumstances the traditional structure for project implementation would be the Haitian Ministry of Agriculture (DARNDR). However, the GOH is currently under dire fiscal pressure as it continues to function within the budgetary limitations set by the IMF stand-by agreement. USAID must not burden the government with an unplanned-for emergency development project of this nature, straining its counterpart development fund account as well as its scarce operating funds. These problems can be overcome through utilizing a third party to implement the project.

IICA is an ideal candidate for such a function. By working with IICA on this project, USAID can have access to the technical and organizational contributions of DARNDR, with no financial burdens being placed on that fiscally constrained ministry. IICA operates in Haiti through a recently renewed country agreement with DARNDR, whose minister sits on IICA's Board of Governors. IICA operates with the Ministry on a multiplicity of organizational, technical, and professional levels.

IICA's operating environment. Concern was expressed in Washington that IICA may be bound by other institutional relationships which might compromise its objectivity. The PLD guidance cable (Annex A) suggests that IICA's close links with the GOH might lead to other demands being placed on it, demands

that might interfere with IICA's ability to implement the project. It is the considered opinion of the design team that these concerns, while valid, will not interfere with the implementation of the project.

IICA's staff and budget are limited, while its organizational and operational responsibilities in Haiti are many. The present project has been designed with this in mind, and will not provide funds for more than a minimal level of technical inputs. Much of the administrative burden of project implementation will fall on IICA's core staff. If this were not the case, and scarce funds would have to be disbursed to hire administrators, the project would have to make do with an even lower level of technical assistance that is now budgeted for.

In spite of these savings in administrative costs, however, the DAEC was concerned that IICA's current institutional identity would distract from, as much as it may contribute to, project implementation. This is a legitimate concern, but the design team felt that, in IICA's case, it was more than compensated for by the following considerations:

- (1) IICA knows how to get things done in Haiti, where members of a new team might have to take time to learn their way around. Not only do IICA staff know where and how to obtain results in Haiti, but IICA's public-sector institutional status and its educational reputation will open doors for them that might otherwise remain closed.
- (2) IICA's technical and organizational links to the Ministry and to the international agricultural and scientific community will induce these and other third parties to cooperate more enthusiastically with this project, as they will feel that they can have a more certain institutional, scientific, and material access to its results.
- (3) IICA is not only a major repository of state-of-the-art knowledge about animal husbandry in the tropics, but it commands a flexible and prompt access to such expertise throughout the hemisphere.
- (4) IICA implemented the PEPPADEP program; its members feel an institutional responsibility to repopulate Haiti with at least the same number of pigs as it took the lead in helping to eradicate. This sense of responsibility may lead IICA to make greater sacrifices for the sake of this project than USAID could expect of any other potential cooperator.

The cooperative agreement with IICA (see annex E) is quite specific as to each party's functional responsibilities. It also will spell out the full-time tasks of all personnel paid for through this project so that there will be no temptation to deploy them, however temporarily, elsewhere on other IICA operations and for other IICA purposes.

IICA's relations with the SMCs. IICA has traditionally had strong relations with DARNDR, and concern has been expressed that DARNDR's local-level networks may interfere with assisting the PVOs to prepare their own secondary multiplication facilities. While many of the eligible PVOs have strong working associations with District-level DARNDR agronomes, they have not worked as extensively with the higher-level DARNDR technicians who have served as counterparts on previous co-operative efforts with IICA. IICA has developed a close working relationship with the PVOs in the context of the

PEPPADFP effort, particularly its recent sentinelization phase. IICA's recent agreement with DARNDR now authorizes it to work directly with PVOs in Haiti, providing it with a flexibility unstipulated in previous working agreements.

The project design team has devoted a considerable amount of time to identifying the PVO operations with sufficient agricultural expertise and strong enough links to the target population to be eligible to be supplied with breeder pigs through this project. IICA will have the benefit of this research, and it should serve as the basis of their first set of extension contracts with these organizations. A preliminary list of the best-qualified organizations to serve as SMC managers is appended as annex K.

In working with the DARNDR district offices that may prepare a SMC to receive pigs, IICA will be treading on familiar ground. IICA will have nearly a year to establish solid swine husbandry extension links with the chosen SMC managers before they begin to receive breeder pigs from the NBC. IICA will provide the SMC managers with low-cost model farrowing barn designs, swine nutrition and health surveillance work plans, as well as Creole language swine production materials.

The Technical Viability of Institutions that could serve as SMC Managers: In preparing the list appended to this paper, the project design team used the criteria set in the attached form letter. It was on the basis of these criteria that the list that follows this analysis was prepared. The programs of over 70 PVOs working in the agricultural sector all over Haiti were investigated. The 42 local programs with strong livestock programs were given particular attention in preparing the list. The design team concluded that there was a sufficient number of technically competent organizations among this number. The identified PVOs share, both philosophically and operationally, the design team's small farmer orientation, designed to undertake secondary multiplication with the F₁ breeder pigs.

Distribution Plan From the NBC to the SMCs. This analysis includes a preliminary list of local-level agricultural development organizations that could meet this project's three criteria for eligibility to receive breeder swine from the NBC. These criteria are:

- (1) a proven record of success with agricultural development programs targeted on the small Haitian farmer in the currently occupied locality;
- (2) the organizational, management, technical and financial capacity to construct and operate a secondary multiplication center (no pigs will be promised to any organization by IICA until such a center is constructed);
- (3) a plan that insures that the smaller Haitian farmer, male or female, can have access at a price they can afford to at least 50% of the piglet offtake from the SMC. The other half sold can be culled or sold as breeding stock at the market rate in order that the SMC can recover costs.

During the first phase of project implementation IICA will consolidate its relationship with the potential SMC managers listed in Annex K and will seek to identify additional eligible operations that may not have yet come to USAID's attention. IICA will then sign a memorandum of understanding with each of these organizations guaranteeing them a certain percentage of the offtake from the NBC should they construct, at their own expense, an

acceptable SMC in which to receive an agreed-upon number of breeder sows. IICA will then supply the signer with extension advice and SMC design drawings. Before receiving pigs, however, not only will the SMC have to be built, but its managers also will have to have presented IICA with an acceptable distribution plan. IICA's options for standards for setting these plans are reviewed in the next section. Once an acceptable SMC is constructed and an acceptable distribution plan is received, IICA can begin to supply the local-level management organization with materials, extension advice, and breeder pigs.

Outreach fund. The proceeds generated at the NBC from the sale of the culled pigs for human consumption may be used to assist the SMCs in strengthening their breeding and distribution operations. This assistance may be extended to individual SMCs, provided that they have met the established criteria for participating in the project, and that IICA is satisfied that the funds will promote the objectives of the project. Definition of the procedures governing the provision of this assistance have been written as a condition precedent to disbursement under the project. The proceeds generated from the sale of the culled pigs at the NBC will be placed in a special account in a local bank.

Distribution Plans from the SMC to the Target Population. The SMC-to-peasant linkage lies at the heart of the project. The way in which it is perceived by the Haitian population at large will depend on the equity of this distribution process. Therefore, USAID will require that IICA receive a distribution and cost recovery plan before the management unit is supplied with pigs. This plan should allow the smaller peasant farmer to have access to at least half of the SMC's piglet offtake, no matter how high the market rate for those piglets.

In order to ensure that small farmers do gain access to these breeder pigs, IICA can ask the SMC managers either to give one half of them to such farmers for repayment in kind or to hold down the cost of these piglets to less than \$25. USAID does not want to set an exact policy in this regard but it will expect IICA, one way or another, to provide for these small farmers. The nature of this subsidy may vary from SMC to SMC but the principle of its impact will be maintained. IICA may find that a standard policy across the board, such as repayment in kind, or less than \$25, may be the easiest way in which to administer this equity requirement.

It is hoped that most SMCs can be built with farmers who will receive, six months later, breeder gilts in exchange for their efforts. This arrangement has even better equity advantages than does repayment in kind or the subsidized \$25. rate. Possibly a combination of these options will prove the most effective. IICA will be asked to study these different options, in light of the project's equity objectives, before any firm guidelines are set.

D. Economic Analysis

Introduction. Prior to the outbreak of ASF, pig-raising was a dominant activity in the rural economy of Haiti. Annual production of pigs was estimated to be between 12 and 24 thousand metric tons (table 4). On the basis of these figures and a series of recent pork meat prices (tables 5 and 6), the pre-ASF value of pork meat production is estimated to be over \$30 million per year.* With the eradication of pigs in the country, Haitians are experiencing enormous economic losses.

The significance of pig production to the small farmer becomes apparent on the basis of estimates that only 15 percent of production came from commercial operations in the country. One large-scale operation existed in the Port-au-Prince area, and several small commercial operations of 5-20 sows were scattered throughout the country. For the most part, production was based at the small farmer level. Approximately 86% of the rural population participated in pig production. In short, it is the small farmer who suffers the most from the absence of pigs.

This project will have an important economic impact on the Haitian economy through the intensive multiplication of breeding stock, and the distribution of this breeding stock to farmers in the country-side. After an initial period of multiplication and distribution of breeding stock, the benefits attributable to the project on a yearly basis will approach and eventually exceed those currently lost to the economy in the absence of pigs. The costs of the repopulation effort will be substantial. For the most part, these costs result from the construction of multiplication centers, and the provision of feedstuffs and labor inputs, none of which is to be financed by AID. As the representative budgets in the following analyses will show, these costs eventually will be recuperated by viable and self-sustaining pig production enterprises at the secondary multiplication center (SMC) and farmer levels.

The economic analysis of this project contains a discussion of the following:

- (1) an assesment of the financial viability of pig production at both the farm level and SMC level;
- (2) the non-quantifiable benefits of the project;
- (3) a cost-benefits analysis;
- (4) projection of the Haitian swine population with and without the project; and
- (5) alternative project designs.

* Taking the 1974-76 USDA figure for pork production of 12 thousand metric tons, and assuming a 67 percent meat off-take from this production and an average pork meat price of \$3.97/kg in 1978, an estimate of the pre-ASF value of pork meat production is \$31.9 million.

Table 4

Livestock Production, Averages for 1961-65 and 1974-76
(thousands of metric tons)

<u>Products</u>	<u>1961-65</u>	<u>1974-76</u>
A. <u>USDA Data</u>		
Beef and veal	11	11
Mutton and lamb	2	2
Pork	13	12
B. <u>FAO Data</u>		
Beef and veal	13	18
Mutton and lamb	n.a.	n.a.
Pork	17	24
Goat meat	3	4
Horsemeat	3	4
Poultry	2	3
Edible offals	3	5 ^a
Lard	1	1
Cows' milk	27	40
Goats' milk	18	24
Goat cheese	1	2
Eggs	6	8

Source: Zuvekas, Clarence. Agricultural Development in Haiti, Agency for International Development, Washington, D.C., 1978

^a1973-75.

n.a. Not available

Table 5

Meat Prices in Port-au-Prince and Cap-Haitien

1978-1982

Years	<u>Port-au-Prince</u>			<u>Cap-Haitien</u>		
	Pork	Beef	Mutton	Pork	Beef	Mutton
		\$/kg			\$/kg	
1978	4.87	3.26	2.12	3.08	3.03	2.83
1979	4.59	4.27	3.97	4.43	3.75	4.06
1980	4.98	5.25	5.30	5.38	4.38	5.01
1981	6.05	6.20	6.12	5.92	4.93	5.60
1982	7.80	7.12	6.44	6.06	5.39	6.11

Source: IICA, Project Paper for Swine Repopulation in Haiti, 1983

Table 6

Average Live-weight Pork Price Quotations for Haiti, and Sources.

\$110.00/30 kg adult (\$1.33/kg)	Matter, Sharon, "Livestock
\$80.00/50 kg young (\$1.60/kg)	Production in Haiti", USAID/
\$14.00/6 kg piglet (\$2.33/kg)	Haiti, 1983
\$1.00/kg for market weight pig	Bellande, Alex. <u>Ration-</u>
	<u>nalite Socio-Economique des</u>
	<u>Systemes de Production Agri-</u>
	<u>cole en Haiti: Une Etude de</u>
	<u>Cas</u> , MS Thesis, Univ. Mac
	Gill, 1982
70.4 cents-92.4 cents/kg for	HAMPCO Management, 1983
local market weight pigs	

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Assessment of Financial Viability at SMC and Farmer Levels. The favorable economic impacts expected from the Interim Swine Repopulation project will be essentially due to the pig production activities at the SMC and farmer levels. This section discusses the implications of the project at these levels, and provides the aggregate economic projections.

The role of the SMCs in the Interim Swine Repopulation project will be an important one. Pigs bred at the nucleus breeding center will be distributed to the SMCs, which in turn will breed the next pig generation for distribution to farmers. The project implementation plan foresees the distribution of 3740 breeding gilts to the SMCs, and the subsequent yearly distribution of 75% of their female offspring (approximately 18,743 gilts) and 15% of the male offspring to farmers. The realization of the project plan and the potential economic benefits to the society is dependent upon the SMCs carrying out their intended role in a financially sound manner.

Calculations of the financial costs and returns of a representative SMC provide an indication of the financial viability of these production units (table 7). The major costs incurred at this level are for buildings, maintenance, supplemental feedstuffs, medicines, management, and labor. Revenues will be generated from the sale of offspring as breeding animals to small farmers and culls for slaughter.

Each SMC production unit is likely to have unique operating circumstances. The representative SMC portrayed in Table E-4 will have a pen with farrowing stalls; a local supply of low cost feedstuff in the form of herbs, crop residues and fruits, which will be supplemented by rice or wheat bran and mineral supplements; a manager responsible for accounts, distribution and unit management; and unskilled labor. Typically, eight sows and two boars will be provided by the nucleus breeding center. The sows will have an average of two litters of seven piglets per year.

Of the 112 piglets produced per year, approximately 42 females and 8 males will be distributed to farmers as breeding stock. The remainder will be culled to support the operations of the SMC. Feed costs have been calculated on the assumption that piglets distributed to farmers will be fed for two months, and the culls will be fed for one year before being sold.

The revenues generated from the sale of animals are calculated at the assumed prices of \$25.00 per breeder and \$75.00 per cull. At these prices, the representative SMC will be capable of recovering its investment in the second year of operation and will have an financial internal rate to return of 32% over ten years of operation. These estimates indicate that there will be adequate financial incentives for SMC participation in the project.

Each SMC will have flexibility in its operation scheme in order to ensure that costs are recovered. A general guideline applied to all SMCs participating in the project is that they sell no more than 50 percent of the production on the open market, the rest to be sold to farmers as breeding stock. The breeding stock, technical assistance and limited financial assistance for production inputs which will be provided by the project will help to reduce the initial start-up costs and the financial risks inherent in such production enterprises.

Table 4. Representative SMC Hog Production Budget by Year in U.S. Dollars

Costs:	1	2	3	4	5	6	7	8	9	10
Buildings 1	2500									
Maintenance 2		250	250	250	250	250	250	250	250	250
Feed 3	500	3517	3517	3517	3517	3517	3517	3517	3517	3517
Medicine 4	20	228	228	228	228	228	228	228	228	228
Management 5	600	600	600	600	600	600	600	600	600	600
Labor 6	52	52	52	52	52	52	52	52	52	52
Sub-Total	3672	4647	4647	4647	4647	4647	4647	4647	4647	4647

Revenues: 7

Sales to Farmers		1250	1250	1250	1250	1250	1250	1250	1250	1250
Sales to Market		4650	4650	4650	4650	4650	4650	4650	4650	4650
Sub-total	0	5900	5900	5900	5900	5900	5900	5900	5900	5900
Net Returns	-3672	1253	1253	1253	1253	1253	1253	1253	1253	1253

Discounted net returns at %10

-3672 1139.091 1035.537 941.3974 855.8159 778.0144 707.2858 642.9871 584.5337 531.3943

Net Present Value at 10%
at 35% 3544.057
-532

Internal Rate of Return 32.85262

Assumptions:

1. Reproductive construction cost of 2500.00 per sow 2-bear unit with farrowing pens.
2. Construction of facilities with local materials would be less costly.
3. Land purchase cost is 10% per year.
4. Feed costs are 350.00 per animal per year. This is supplemental to local cost-less energy feedstuffs.
5. Labor and surplus fruits, herbs, piglet berries, and crop residues.
6. Annual vaccination against MCH, enteritis, mastitis, and Agalactia) are assumed to cost 10.00 per animal per year.
7. Manager's salary of 500.00 per man month. A manager with a secondary school education is available to manage four units. His salary, on the basis of discussions with private voluntary organizations in Haiti, has been estimated at \$200.00 per month.
8. 20 piglets per year at 41.00 per piglet, less than an hour's worth of physical labor per day is assumed to be necessary for the operation of the unit.
9. A representative SMC with 8 sows and 2 bears will be producing approximately 112 piglets per year.
10. 7 piglet litters per sow per year. Half will be females, the other half males.
11. Approximately 75% of the females and 15% of the males will be sold to farmers as breeding stock for at least \$25.00 per animal. The remainder will be sold for slaughter after feeding—but for one year at an assumed average price of \$75.00 per animal. In reality, prices will be subject to variation on the basis of market conditions.
12. SMC cost recovery scheme.

Source: Project paper technical coefficient, social analyses, price quotations and discussions with private voluntary organizations.

The viability of pig production at the farm level was apparent before the outbreak of ASF. Approximately 86% of the rural population participated in pig production, and farm output comprised the majority of annual production for the country as a whole. Table 8 provides representative data on financial costs and revenues for pig production at the farm level.

Typically, the farm production unit is a low-management, minimum-input operation. Costs are incurred with the purchase of feedstuffs when seasonal crops residues and kitchen wastes are insufficient to support the animals. Family labor embodies most of the other inputs--providing water, tethering or guarding the animals, building pens and collecting feedstuffs. As these inputs generally require no financial outlay for the farm production unit, they are not included in the financial calculations.* Costs will be incurred with the purchase of breeding animals from the SMCs.

Despite low pig productivity at the farm level (an average of one five-piglet litter per sow per year), pigs offer attractive returns. In the representative case presented here, the farmer is assumed to raise two of the offspring for sale to a market weight of 75 kilograms after two years. Additional returns are obtained from the sale of culled piglets, and the replacement of market weight breeders with offspring. As the table indicates, the re-introduction of pigs at the farm level will offer favorable financial returns. Initial costs are fully recovered after two years, and the representative farm production unit shows a financial internal rate of return of 148 percent. The high estimated rates of return will help to overcome farmer aversion to risk.

Non-quantifiable benefits. Pigs were and will be an important component in Haitian farming system, consuming feed unusable for other purposes, producing an easily liquidated asset which provides cash needs, and providing a mechanism for savings and a measure of security to the small farmer. Pigs were important capital assets for the Haitian farmer. At times of crises, or when cash needs arose for schooling or social activities, the farmer sold pigs. The difference between investments in pigs (or other livestock) and other capital assets, such as land, is basically the liquidity characteristic. In addition to this, pigs generally are not competitive with humans or other forms of livestock with respect to feedstuffs. Pigs offer attractive returns on investment even at low productivity levels, and inputs of labor and other farm resources are minimal. For these reasons, the re-introduction of pigs into Haiti is eagerly awaited by small farmers.

* Family farm labor does not have a financial cost attributed to it. In the economic analysis, estimation of labor's opportunity cost, or marginal productivity in an alternative use, is used. This has been estimated at \$1.00/man-day. In actuality labor costs will vary by season, region, and task. A recent farm management study (Texas A and M University, "Annual Report, Integrated Agricultural Development Project: Research and Extension Component", Port-au-Prince, 1983) cited a range of \$0.30 to 3.93 per man day.

Table 5. Representative Farm Budget For Hog Production

	Year									
	1	2	3	4	5	6	7	8	9	10
Costs:										
Buildings 1	0									
One Gilt 2	25									
One Boar 3	25									
Labor 4	0	0	0	0	0	0	0	0	0	0
Feed 5	13.2	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4
Sub-Total	63.2	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4	26.4
Returns:										
Hog Sales 6 and replacement	50	50	200	200	200	200	200	200	200	200
Sub-Total	50	50	200	200	200	200	200	200	200	200
Net Returns	-63.2	23.6	173.6	173.6	173.6	173.6	173.6	173.6	173.6	173.6

Discounted net benefits at 10%

-63.2 21.45451 1-1.4711 100.4022 113.5711 127.7519 97.99237 80.98358 73.52335

Net present value at 10%

500.2229

Discounted net benefits at 15%

-63.2 21.45 27.77500 11.11040 4.44450 1.77750 1.110656 1.107705 1.085351

Net present value at 15%

-7.45701

Internal Rate of Return

143.7305

- Buildings are assumed to be constructed from local materials with zero opportunity cost.
- @ \$25.00/animal
- @ \$25.00/animal
- Labor is assumed to come from the family farm at zero financial cost.
- In addition to seasonal and zero-opportunity-cost feeds such as herbs, surplus fruits, and kitchen wastes, the farmer is assumed to purchase wheat or rice bran as a supplement during months when feed is not readily available. 100 kgs. of bran feed per year is assumed to be adequate to maintain a static family herd of 4 animals at a cost of \$66.00/ton.
- The price assumed for the analysis price per kilogram of pork on a live-weight basis is \$1.00. The farmer is assumed to raise for himself two pigs of market weight of 75 kilograms from an average litter size of five piglets, the remainder being sold after weaning, or used for herd replacement. In the aggregate analysis of economic benefits, all of the five yearly offspring are assumed to reach market weight.

Source: Project paper technical coefficients, social analyses, and price quotations.

In addition to the benefits likely to come about from the restoration of pig ownership at the farm level, other non-quantifiable benefits are likely to occur. The secondary multiplication centers will likely have a demonstration effect on the small farmer which will favorably affect pig productivity on the farm above the levels prior to the outbreak of ASF. Although there is no extension component to the project, the better husbandry methods which will be practiced at the SMC level will be transferred to the small farmers.

Finally, one of the major problems in the Haitian economy is the lack of medium-level economic enterprises in rural areas. This project, by providing pigs at no cost to small livestock production units, will encourage the development of such economically viable, mid-level production units.

Economic Cost-Benefit Analysis Haiti's economic policies do not significantly distort the true costs of project inputs. Due to a relatively stable exchange rate (5 gourdes to 1 dollar), domestic prices have not departed from international prices except for a few cases of government created monopolies or import taxing policies. Financial costs, as expressed by market prices, essentially represent the true economic costs to the society of utilizing project resources in a certain manner as opposed to some alternative use. The economic costs of this project generally reflect market prices for the resources.

The aggregate economic costs of the project, outlined in table 9, are arranged at three levels: the cost of primary breeding facility and the costs at the SMC and farmer levels. At the level of breeder facility costs are incurred for the HAMPCO lease and management contract, commodities, long and short-term personnel, and other services for project support. At the SMC level, economic costs are incurred for buildings, maintenance, feed, medicines, management, and labor. In addition to the market purchases of supplemental feedstuffs, costs at the farm level are incurred in labor inputs. Labor inputs embody the majority of costs at the farm level in that it is labor that gathers local feedstuffs, tethers animals, and provides water to the animals.

The benefits to the project are derived from pig production estimates. Pig production is estimated from the time when the pigs conceivably could be brought to market weight and culled in successive project years. No pigs are double-counted. In other words, pigs are farrowed and assumed to be fed to market weight eight months at HAMPCO, one 1 year at the SMC's, and two years at the farm level. The prices used to estimate the value of pigs are based on price quotations cited earlier for market-weight animals. These prices are very likely to be underestimations of what the real price will be, given the current absence of pigs in the country and high demand for pork products. The analysis has assumed that the pigs would be raised to 220 kilos at HAMPCO and 75 kilos at the SMCs and small farmer levels. Calculations of aggregate project benefits are made on the basis of production at the three levels (Table 10).

Project costs and benefits are used to obtain measures of the project's net present value (NPV) and internal rate of return (IRR) in Table 11. First, yearly benefits minus costs (net benefits) have been discounted by a factor which approximates the return to capital in an alternative use (the opportunity cost of capital). The NPV is the sum of discounted net benefits experienced throughout the period of ten years. The NPV of this project, discounted at an opportunity cost of capital of 10 percent, is

Table 9

Economic Costs of the Interim Swine Repopulation Project by Year

1 2 3 4 5 6 7 8 9 10

	1	2	3	4	5	6	7	8	9	10
HAMPCO										
Lease	275000	300000								
Management Contract	88000	92000								
COMMODITIES										
Pigs (C.I.F.) 1	157500	0								
Feed 2	315000	340000								
Equipment 3	205000	60000								
Mineral Supplement	16500	18000								
Vehicles 4	60000	0								
PERSONNEL 5										
Long-term Tech. Asst.	271000	264000								
Short-term Tech. Asst.	32000	24000								
Other Personnel	70290	75680								
OTHER										
Extension - Production services 6	22000	24000								
SUB-TOTAL	1512290	1218680								
SNC LEVEL										
Buildings 7	42000	1133750								
Maintenance 8	0	4200								
Feed 9	9400	311920								
Medicines 10	336	11200								
Management 11	20160	544200								
Labor 12	874	23587								
SUB-TOTAL	71770	2028857	2348130	2348130	2348130	2348130	2348130	2348130	2348130	2348130
FARMER LEVEL										
Breeding Pigs 13	0	285676	0	0	0	0	0	0	0	0
Feed - Breeding Stock	43665	192376	1261312	2235948	3210594	4185220	5159556	6124492	7109128	8083711
Feed - Culls 14		181929	192376	341098	476999	639510	787221	935932	1084644	1,233,328
SUB-TOTAL	330341	1635617	6525117	9517221	11877606	14237971	16598377	18946807	21506192	24089725
TOTAL	1584060	3577878	3983747	5907543	8873247	11865351	14225736	16586121	18946807	21506192

Table 6. continued

Assumptions:

1. 400 sows and 50 boars at \$350.00 each.
2. 4500 tons at \$150.00 per ton.
3. Includes items such as pails, boots, medical equipment, etc.
4. Two Jeep Cherokees and one twenty-foot truck.
5. Swine Production Expert (PASA), IICA Project Director (PASA), Swine Nutritionist, Short-term Entomologist and Veterinarian, Long-term laborers.
6. Includes vehicles maintenance, fuel and repairs.
7. Based on the construction of approx. 17 and 454 10-sow production units in year 1984 and 1985, respectively, at \$2500.00 per unit.
8. Depreciation of 10% per year.
9. \$50.00 per animal per year in supplemental feeds in addition to cost-less local energy feeds. The number of animals to be fed is calculated on the basis of the cumulative number of breeding stock plus the number of animals not distributed to farmers and fed for one year before sale or slaughter.
10. \$2.00 per animal per year.
11. Four production units can be managed for \$200.00 per man-month.
12. 52 man-days per unit per year at \$1.00 per man-day.
13. \$52.00 per man-year for each breeding sow distributed.
14. 100 kilograms of rice or wheat bran per pig at \$66.00 per ton. Culls have been fed for a total of two years.

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Table C
Benefit Cost Analysis of The Interim Swine Repopulation Project by Year

Quantifiable Project Benefits in U.S. Dollars

	1	2	3	4	5	6	7	8	9
15200	947900	2398800	5822625	12851250	26908500	33937125	40965750	47994375	5502500

Project Costs

1584060	3577878	3983747	5907543	8873247	11865351	14225736	16936121	18946507	21011111
---------	---------	---------	---------	---------	----------	----------	----------	----------	----------

Net Benefits

-1568860	-2629978	-1584947	-84918	3978003	15043149	19711389	24379629	29047358	33716100
----------	----------	----------	--------	---------	----------	----------	----------	----------	----------

Discounted Net Benefits at 10%

-1562860	-2390889	-1309874	-63800.2	2717030.	9340612.	11126565	12510605	13551045	14293392
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

Net Present Value at 10%

58211354

Discounted Net Benefits at 70%

-1566860	-1547046	-548425.	-17284.3	476287.8	1059483.	816626.9	594134.3	416411.7	284000.
----------	----------	----------	----------	----------	----------	----------	----------	----------	---------

Net Present Value at 70%

-34357.4

Internal Rate of Return

69.96461

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PROJECTED NUMBER OF PIGS IN HAITI DURING YEAR

(Table 12)

HAMPCO 1/

SMC 2/

FARMER 3/

Year	Breeding		Feeder		Cum. Breeding		Cum. Feeder		Total
	Stock	Culled	Stock	Pigs	Stock	Pigs	Stock	Pigs	
1	452	152	168						772
2	452	4404 4/	4536	8084	6616				24,092
3			4536	27448	29238	27565			96,871
4			4536	27448	51860	121280			260,137
5			4536	27448	74482	308710			563,904
6			4536	27448	97104	402425			887,671
7			4536	27448	119726	496140			1,077,723
8			4536	27448	142348	563355			1,267,775
9			4536	27448	164970	683570			1,497,827
10			4536	27448	187592	777285			1,707,879

1/ Estimated on a weekly basis at 8 pigs per litter. 2,48 litters a week

US\$58,211,354.00. The internal rate of return, or the rate of return on capital invested in the project, is estimated to be 69.9 percent. The project investments appear to have a very strong economic rationale.

Pig Projections. On the basis of the technical assumptions and the project implementation plan there will be approximately 1.7 million pigs in Haiti by year ten. Pigs will breed at different rates depending upon where they are: at HAMPOO, in the SMC, or on small farms. They will also be culled at different rates depending upon their location. Projections use the assumptions listed in the following table.

Table 12

Assumptions Concerning Repopulation

Breeding Facility	No. of Litters per year	No. of Pigs surviving each litter	Cull Rate
HAMPOO	2.4	8	25% females 85% males
SMCs	2	7	25% females 85% males
Small Farmers	1	5	0 first gen. all second gen.

After year two the breeding stock at the SMCs will have reached (4536). These pigs will breed 49,980 pigs for distribution to small farms per year. Of these, approximately half will be gilts, of which 75% will be distributed to farms, where another generation will be bred; any subsequent generations will be slaughtered or used for the purpose of herd replacement.

Without project. The capacity of Haiti to repopulate would be very limited without the project. The 2000 sentinel pigs at the farm level would repopulate at a very slow rate, given the logistics of recollecting the pigs, the costs of refurbishing breeding centers, and the absence of any feasible plan and financial support for use of the pigs at this time. Private importation would also occur at a very slow rate. HAMPOO was the only large commercial venture before ASF. Any pigs produced there went for slaughter and not for breeding. HAMPOO would not enter into a breeding operation because it would not be profitable (see Table 13).

It is likely that the private importation of pigs and the breeding of sentinel pigs will occur at the same rate with or without the project. The market for pork is sufficiently segmented to cause one to believe that the HAMPOO production of pigs would have little impact on the rural market, where there is a substantial demand for pigs. The repopulation rate of the sentinel pigs would be sufficiently slow to prevent overlap.

Project alternatives. Several project alternatives were suggested during project development. None of them is considered to be completely viable for technical, financial, or organizational reasons. Supporting government efforts for the use of the 2000 sentinel pigs of the PEPPADEP program as breeding stock was suggested as an alternative to importing a new breeding

Table 8.1 Economics of Alternative Repopulation Scheme

	Year									
	1	2	3	4	5	6	7	8	9	10
Project Costs at the nucleus breeding center and secondary multiplication levels 1	1584060	3247537	2348130	2348130	2348130	2348130	2348130	2348130	2348130	2348130
Project benefits attributable to these levels	15200	947900	2398800	2398800	2398800	2398800	2398800	2398800	2398800	2398800
Net benefits	-1568860	-2299637	50670	50670	50670	50670	50670	50670	50670	50670
Present Value of benefit stream discounted at 10%	-1568860	-2090579	41876.03	38069.12	34608.29	31462.08	28601.89	26001.72	23637.93	21489.03
Net Present Value at 10%	-3413693									

1. Project costs and benefits are taken from tables 6 and 7.

stock. The government-owned sentinels were originally to be placed on farms for a period of 45 days and then rotated to other farm to see if the ASF virus was still in existence. There are no current plans to place them in breeding units after Haiti is declared ASF free, breeding units have not been constructed and support services have not been budgeted. Any attempt to retrieve the pigs can only be partially successful, very costly, and cannot be expected to contribute significantly to swine repopulation. In addition to these reasons, the GOH is not in the position to supplement such a project alternative USAID/Haiti policy with respect to alternative project designs involving the government was one that attempted to avoid recurrent costs and government budget problems. This project alternative has such problems in that a large number of personnel and other support services would be required.

Another alternative was to place pigs directly at the SMCs without using the HAMPCO facilities. The possible savings from not renting the HAMPCO facilities would never materialize, because the facilities would have to be rented anyway to serve as a quarantine station (15 shipments of 300 animals every 45 days would require a facility for at least 22 months), and an equivalent amount of feed and labor would be required. The imported pigs would cost approximately \$1,500,000 at the level anticipated by the AID project, and additional technical assistance would have to be added to the project to pay for the time to supervise the buying, importation and unloading of the constant flow of pigs. In addition, with new pigs entering the country each month, there would be the additional possibility of bringing in diseased animals.

On the basis of the high projected rate of return to the project, it has been suggested that private concerns would be interested in investing resources in a breeding project (taking over the AID role) in order to capture the high anticipated benefits. One important factor mitigating against private investment is that the majority of project benefits accrue at the farm level. A private breeding project would need to have hog finishing operations, or sell breeder pigs at high prices in order to recover costs. Both would have the consequence of limiting the scale of repopulation, or limiting repopulation benefits to wealthier farmers.

For lack of real technical and institutional alternatives to the Interim Swine Repopulation Project, and the projections of limited repopulation without the project, AID has a strong reason for involvement. The potential benefits for the Haitian farmer and society give the project a sound economic rationale.

D. Procurement and Contracting Plan

The project will be obligated by means of a Cooperative Agreement with IICA, which will assume full responsibility for project execution. Because the Cooperative Agreement is the key implementing document of the project, a draft copy of the principal PIO/T has been included as a part of this Project Paper (See Annex E). The PIO spells out the roles and responsibilities of each of the project personnel.

Under the CA, IICA will recruit project personnel, secure short-term technical assistance as required, and import commodities, including the swine stock (see below).

A waiver of competitive procurement has been requested from the Administrator for leasing of the HAMPCO facilities on the basis of predominant capability.

Under the Cooperative Agreement, there will be a number of discrete contract activities, each of which will be administered by IICA and approved and in some cases countersigned by USAID/Haiti. Each of these is discussed below.

- (1) Lease of HAMPCO facilities. IICA will enter into a long-term lease with HAMPCO for the use of their facilities as the Nucleus Breeding Center. The price of the lease has already been the object of lengthy discussions between HAMPCO management and USAID/Haiti personnel, and a fairly firm level for the costs has been established, based upon written exchanges between ADO personnel and HAMPCO management. A copy of their cost proposal is attached as Annex F. The final funding level will be subject to negotiations by IICA with the participation of the USAID/Haiti Contracts Officer. HAMPCO may also charge a management fee to cover the services they provide to the project, such as assistance in handling of feed commodities, provision of chlorinated water to the pens, and electricity. It is likely that HAMPCO will be called upon to undertake the management of the facility as well, in coordination with the AID-funded swine production expert, and that they will charge a fee for this service.
- (2) Laborers at the Breeding Center. From discussions with HAMPCO personnel, it was estimated that approximately 32 laborers should be hired for day-to-day feeding and breeding operations. These will be hired under contracts with IICA, and approved by the Swine Production Specialist.
- (3) Technical personnel. The technical personnel will be recruited by IICA, based upon their extensive technical network throughout the Caribbean region.
- (4) Feed and other supplies. These will be procured by IICA, in cooperation with the Swine Production Specialist. As is discussed in the Technical Analysis, it is believed that all feedstuffs are readily available in Haiti: these include agricultural wastes, wheat and rice tailings, and molasses.

In all cases in which technical specifications for commodity and services procurement are not given in the body of this project paper, they will be agreed to by exchange of letters between IICA and USAID before procurement is undertaken.

V. PROJECT IMPLEMENTATION ARRANGEMENTS

A. Financial Plan and Budget

The project budget is given on the next page. LOP funding of the project is \$3,000,000, of which most is dedicated to commodity procurement and technical assistance. It is hoped that full up-front funding will be available for FY 1983, and that incremental funding will not be necessary. Because the LOP is only two years, no provision has been made for inflation or other cost increases.

Individual SMC financial plans. The repayment scheme proposed by each SMC will be the subject of guidelines established by IICA and the USAID/Haiti Controller. These guidelines will suggest the financial system for the SMC to use, but will not exclude the possibility of "tailor-making" a plan for an individual situation or area. For example, it is likely that the guidelines will prescribe that not more than a certain percentage (25% or 50%) of the F₂ offspring may be sold at market rates to defray the operating costs of the Centers. It will be urged that each individual SMC reinvest the revenues from the sale of its pigs into a revolving fund to offset breeding costs.

The budget has been designed with three principal categories: production, distribution, and monitoring and evaluation. Each of these activities includes some technical assistance as well as procurement of some commodities. There is no provision for participant training.

Method of payment. The simplest administrative mechanism for payment is through a Federal Reserve Letter of Credit (FRLC), although IICA does not customarily use this system. It is most likely, therefore, that the direct payment mechanism will be used.

B. Implementation Plan

The grant will be obligated by means of a Cooperative Agreement with the Interamerican Institute of Cooperation in Agriculture (IICA), to be signed in Haiti in mid-September, 1983. All in-country procurement will be undertaken by IICA, and all major contracts will be negotiated by IICA and countersigned by the Mission.

Once the Cooperative Agreement is signed between the Mission and IICA, the first step in project implementation will be the drawing-up of a LOP implementation plan by the project director and the USAID project manager. IICA will then proceed to procure the services of the Swine Production Specialist and the Extension expert. The project administrator for IICA will be an IICA employee, funded outside of this project, who will most likely possess expertise in animal husbandry. He will coordinate all components of the project.

Interim Swine Production
Estimated Project Budget
By Line Item

Costs in
US \$

Version of
8/26/1965

Item	Quantity	Unit	Unit Cost	Total
<u>Swine Production</u>				
Swine Production Expert	24	P-H	9,000	216,000
Short-term FA	23	P-H	10,000	230,000
Breeder Swine Stock	450	Pigs	350	157,500
Feed	4,000	Tons	171	684,000
Mineral Supplement	500	Tons	100	50,000
Vehicle	1	Each	15,000	15,000
Flatbed Truck	1	Each	32,000	32,000
Personnel Support Costs	24	Months	1,000	24,000
(SUBTOTAL)				1,333,500
<u>Distribution</u>				
LT Extension Expert	20	P-H	10,000	200,000
Extension Personnel	48	P-H	1,000	48,000
Vehicle	1	Each	15,000	15,000
Medicine	12	Months	1,000	12,000
Other Direct Costs	24	Months	3,000	72,000
Evaluation	1	Each	9,000	9,000
(SUBTOTAL)				322,000
TOTAL				1,720,500
FICA Overhead			25%	430,125
TOTAL (Under FICA Overhead)				2,150,625
HAMPCO				
-Lease	24	P-H	21,000	504,000
-HBC Laborers	24	P-H	6,390	153,360
-Management Fee	24	Months	8,000	192,000
GRAND TOTAL (PROJECT)				2,999,985

Interim Swine Production Estimated Project Budget By Currency			
Item	US-Dollar Funded	Local- Currency Funded	Total FX + LC
<u>Swine Production</u>			
Swine Production Expert	180,000	36,000	216,000
Short-term TA	200,000	20,000	220,000
Breeder Swine Stock	157,500		157,500
Feed		684,000	684,000
Mineral Supplement	20,000	10,000	30,000
Vehicle		15,000	15,000
Flashed truck	32,000		32,000
Personnel Support Costs		24,000	24,000
(SUBTOTAL)	589,500	799,000	1,388,500
<u>Distribution</u>			
LL Extension Expert	170,000	30,000	200,000
Extension Personnel		48,000	48,000
Vehicle		15,000	15,000
Medicine	10,000	2,000	12,000
Other Direct Costs		48,000	48,000
Evaluation	9,000		9,000
(SUBTOTAL)	189,000	143,000	332,000
TOTAL	778,500	942,000	1,720,500
IICA Overhead	194,625	235,500	430,125
TOTAL (Under IICA Overhead)	973,125	1,177,500	2,150,625
HAMPCO			
-Lease		504,000	504,000
-NBC Laborers		153,360	153,360
-Management Fee	92,000	100,000	192,000
GRAND TOTAL (PROJECT)	1,065,125	1,934,950	2,999,935

During this start-up phase, the formal bid procedures for procurement of the swine breeding stock will be underway. The technical specifications for swine procurement have already been established and are included in draft PIO/T which is attached as Annex E. The purpose of the bidding will be to select the farm or farms from which animals will be procured. Prior to any shipment of swine stock, livestock experts from AID/W and IICA will personally visit the farms and approve or reject each individual animal before it is shipped.

All procurement financed under the Grant will be subject to AID Geographic Code 941 and local source/origin requirements. Almost all equipment will be purchased in the US, with the exception of local shelf item procurements for day-to-day equipment needs.

In most instances, IICA will make travel arrangements and provide clerical services and in-country transportation; however, in selected instances the latter costs may be financed by the grant, with prior approval by AID.

A summary of these contract and procurement actions is given below:

- (a) The implementing agency (IICA) will undertake the following actions:
- (1) negotiate a lease with HAMPCO for use of their facilities, in cooperation with the USAID/Haiti Contracts Officer;
 - (2) contract with the laborers hired to work at the HAMPCO facility;
 - (3) handle operating and repair expenses for the three project vehicles;
 - (4) provide the project's technical personnel with office space, equipment, and secretarial personnel;
 - (5) hire an additional IICA advisor in the field of swine nutrition;
 - (6) purchase all feed, medication and other supplies needed for the project as specified by the swine specialist;
 - (7) arrange for the transportation of pigs and feed when necessary;
 - (8) undertake the planning and coordination of the distribution program, with approval of USAID/Haiti;
 - (9) plan and implement the training program for participating farmers and PVOs;
 - (10) coordinate with the Ministry of Agriculture in the areas of animal health, importation of the breeding stock, and disease surveillance;
 - (11) contract for the technical personnel;
 - (12) contract for the purchase of three vehicles for the use of these technical personnel for project implementation;

- (13) contract for the purchase of 420 gilts and 32 boars for breeding stock; and
- (14) oversee the breeding program, making modifications where necessary.

USAID/Haiti will monitor the progress of the project and the distribution system, and draw up the distribution plan guidelines in cooperation with IICA. The IICA-SMC relationship will be formally established through a protocol which will set out the project objectives, the responsibilities of IICA and the group sponsoring the SMC, and the eligibility criteria for selecting the beneficiary farmers.

The project will be managed within ADO by the Rural Development Officer, who will have frequent meetings with IICA personnel. The Joint Project Implementation Plan (JPIP) or another similar system will be used for project monitoring.

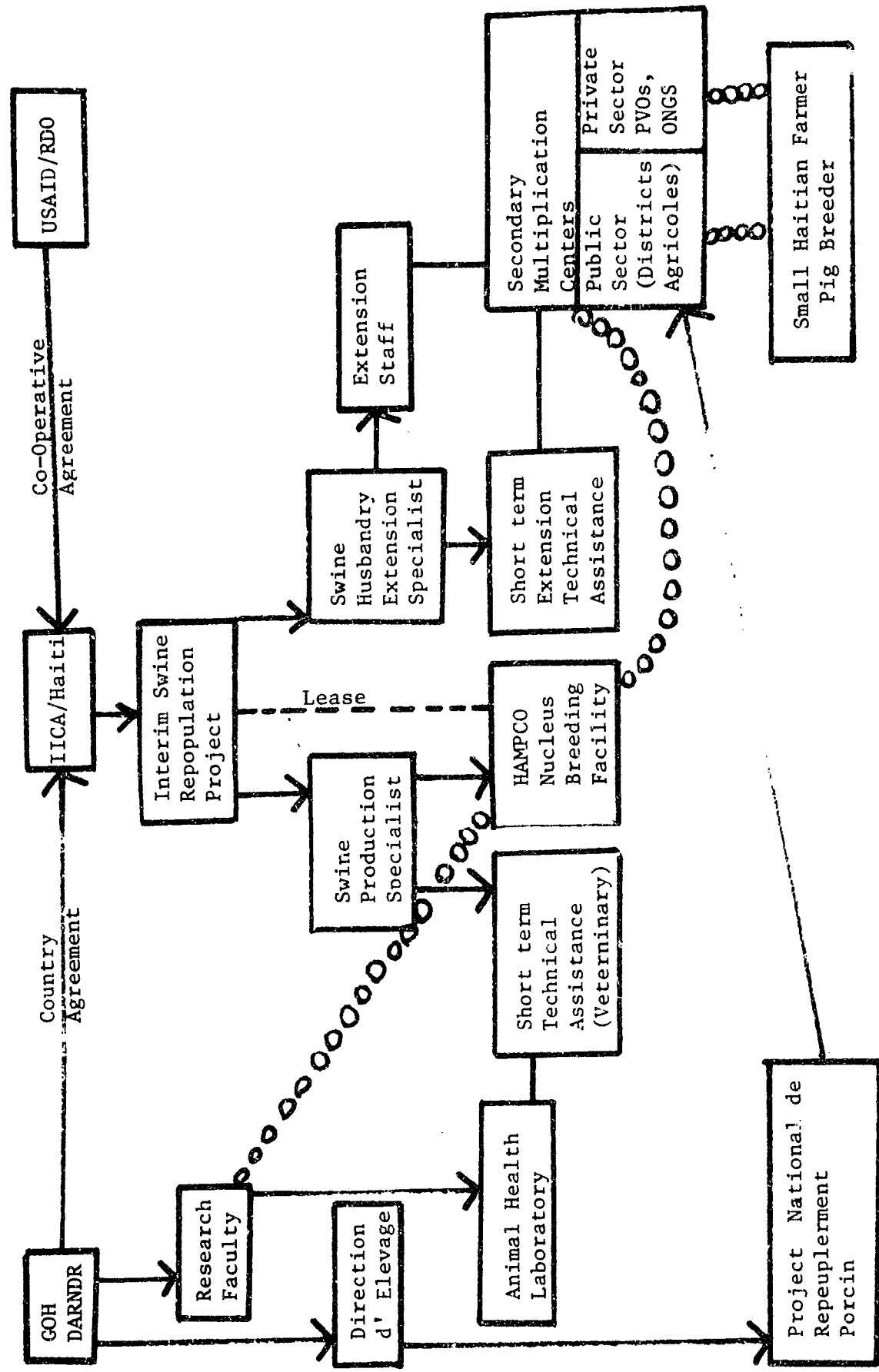
An illustrative graph (bar chart) is given on the next page, and an organigram showing the relationships between the implementing organizations and individuals is given on the following page.

C. Evaluation Plan

Because the life-of-project duration is only twenty-four months, a single EOP evaluation is scheduled. It will take place during the last months of the project, and will require about two weeks. The evaluation team will be composed of AID and IICA personnel, with the possible assistance of the USDA in technical matters. The Mission will request the services of an appropriate specialist from AID/W. The project has allocated \$9,000 for this evaluation.

The evaluation team will consider, among other things, the following:

- (1) the implementation of the project, and whether any lessons may be learned about administrative arrangements and projected timetables for rapidly-disbursing projects;
- (2) the impact of the swine repopulation effort upon the rural poor;
- (3) the effectiveness of the SMCs in reaching the target group; and
- (4) whether any follow-on activity is required.



DEPARTMENT OF STATE
TELETYPE
 AMERICAN EMBASSY, PORT-AU-PRINCE

Annex A
 P 1 of 3
 Date: 12/1/74

ACTION:
 AID-2

NNNNVV F8P0148KA237
 PP RUF8R
 DE RUEHC 0044701 107225T
 ZNR 0000 72H
 P 002154Z JUN 83
 FM SECSTATE WASHDC
 TO AMEMBASSY PORT AU PRINCE REF ID: A681
 BT
 UNCLAS
 STATE 196444
 ADM AID

Classification

- INFO:
- AMB /
- DCM /
- POL
- ECON /
- COMM
- CONS
- ADM
- PER
- D&F
- GSO
- ICA
- AID
- DAO
- MSG
- CRO
- OD
- CFI
- HRON

E C. 12256: N/A
 TAGS:
 SUBJECT: HAITI INTERIM SWINE REPOPULATION PIG GUIDANCE
 CABLE

DATE REC'D		
USAID ROYAL		
OFFICE	ACT	INFO
DIR		
D/DIR		
A/DIR		
CONT		
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FXO		
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OEA		
OPLD		
PHO		
PVD		
RCS		
RDO		
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ACTION TAKEN
 Date:
 By:

1. THE DAEC REVIEW OF THE SUBJECT PID WAS HELD ON MAY 23, 1983. THE PID WAS APPROVED AND, SUBJECT TO THE FOLLOWING GUIDANCE AND RECEIPT/APPROVAL OF PROJECT INITIAL ENVIRONMENTAL EXAMINATION (IEE) IN AIT/W, THE MISSION MAY PROCEED WITH INTENSIVE AIT/W AND APPROVAL/ACTIONIZE THE PROJECT IN THE FIELD.
2. PROJECT IMPACT: QUESTIONS WERE RAISED AT THE DAEC REVIEW ABOUT WHETHER ADEQUATE JUSTIFICATION EXISTED FOR PROCEEDING WITH THIS INTERIM EFFORT GIVEN THE SEEMINGLY SMALL IMPACT THIS PROJECT WOULD HAVE IN MEETING HAITI'S SWINE REPOPULATION NEEDS AND THE PLANNED MUCH LARGER AND COMPREHENSIVE IER PROGRAM. AT THE DAEC MEETING THE MISSION REPORTED THAT WITHIN A YEAR OR TWO AFTER COMPLETION OF THIS TWO-YEAR PROJECT APPROXIMATELY 160,000 PIGS PER YEAR WILL BE PRODUCED BY THE VILLAGE DEMONSTRATION STALLS (SOW HERD OF 20,000-25,000. (MANY MORE THAN THE 6000 CITED IN THE PID.) IT WAS FURTHER REPORTED THAT SOME OF THE SOWS BRED ON-FARM WOULD IN TURN BE SOLD TO OTHER FARMS FOR FURTHER BREEDING. THIS CLARIFICATION ADEQUATELY ANSWERED THE CONCERNS OF THE DAEC. THE FF SHOULD VERIFY THESE NUMBERS AND QUANTIFY, BY YEAR, THE NUMBER OF PIGS TO BE PRODUCED AND THE NUMBER TO BE DISTRIBUTED TO SMALL FARMERS; AND FURNISH DETAILS CONCERNING THE SYSTEM FOR DISTRIBUTION OF PIGLETS BORN ON-FARM.)
3. DETERMINANTS OF SWINE REPRODUCTION: THE RATE OF REPRODUCTION AND ACCURACY OF THE PROJECTIONS REFERRED TO IN PARA 2 WILL BE LARGELY A FUNCTION OF THE SURVIVABILITY/ADAPTABILITY OF IMPORTED PIGS IN HAITI AND THE AVAILABILITY AND AFFORDABILITY TO SMALL LIVESTOCK RAISERS OF COMPLEMENTARY PRODUCTION INPUTS, PARTICULARLY FEED, THAT AFFECT THE RATE OF SWINE REPRODUCTION. THE FF SHOULD EXAMINE THE EXTENT TO WHICH THESE FACTORS PRESENT POTENTIAL PROBLEMS FOR THIS PROJECT'S SUCCESS AND, IF NECESSARY, HOW THIS PROJECT OR OUTSIDE ACTIVITIES WILL ADDRESS THEM. ALONG THESE LINES, THE MISSION SHOULD EXPLORE THE POSSIBILITY OF IMPORTING DISEASE-FREE PIGS FROM COUNTRIES WITH ENVIRONMENTAL CONDITIONS SIMILAR TO HAITI.
4. GOVERNMENT OF HAITI (GOH) INVOLVEMENT: EXCEPT FOR THOSE ACTIVITIES THAT LEGALLY REQUIRE SOME GOH INVOLVEMENT SUCH AS SWINE IMPORTATION AND ENFORCEMENT OF QUARANTINE AND SANITATION, THE PROJECT SHOULD BE DESIGNED TO REQUIRE AS MINIMAL GOH, PARTICULARLY MINISTRY OF AGRICULTURE (MAPRO), INVOLVEMENT AS POSSIBLE. GIVEN THE STOP/GO PROJECT STRATEGY PROPOSED, DISTRIBUTION OF PIGS TO SMALL FARMERS MUST BE DONE AS PROMPTLY AS POSSIBLE. THE MISSION PERSUASIVELY ARGUED AT THE DAEC REVIEW THAT,

Inc: 6/10/83

UNCLASSIFIED
 Classification

Stat. 156444

GIVEN ADMINISTRATIVE WEAKNESSES, MORE THAN MINIMAL DONOR INVOLVEMENT IN PROJECT WOULD MOST LIKELY SEVERELY HINDER ACHIEVEMENT OF THIS OBJECTIVE. LEVEL OF GCH INVOLVEMENT IS A PARTICULARLY RELEVANT CONCERN IF IICA WERE SELECTED AS THE PROJECT'S LEAD IMPLEMENTING AGENCY. ALTHOUGH IICA'S OVERALL MANDATE IS TO ASSIST GOVERNMENTAL INSTITUTIONS, IF SELECTED, ITS PARTICIPATION SHOULD NOT CONSTITUTE A SIGNIFICANTLY GREATER THAN WOULD BE OFFERED WERE THE WINROCK GROUP, REIFFER INTERNATIONAL OR ANOTHER PRIVATE AFFILIATED GROUP TO BE SELECTED. WHERE GCH

INVOLVEMENT IS CRITICAL TO PROJECT SUCCESS (E.G. PROVISION OF ANIMAL HEALTH SUPPLIES), MISSION SHOULD SEEK SPECIFIC COMMITMENT FROM GCH REGARDING FUNDING/STAFFING LEVELS JUDGED NECESSARY.

5. FUNDING FOR NATIONAL ANIMAL DISEASE LAB (NACL) - FUNDING FOR THIS COMPONENT SHOULD BE MADE AVAILABLE UNDER THIS PROJECT ONLY IF ALTERNATIVE DONOR SOURCES ARE NOT IDENTIFIED OR TITLE I PROCEEDS ARE NOT AVAILABLE. IF PROJECT FUNDED, JAEC SUPPORTS MISSION RECOMMENDATION TO LIMIT THIS COMPONENT TO \$70,000 AND REQUESTS MISSION TO IDENTIFY HOW THESE FUNDS WILL BE USED TO RESPOND TO IMMEDIATE HEALTH SURVEILLANCE NEEDS IN FAH. IN ORDER TO COMPLY WITH SECTION 611 (A) REQUIREMENTS OF THE FAH, THE PP SHOULD INCLUDE FIRM COST ESTIMATES OF WHAT THIS PROJECT FINANCES FOR THE NACL.

Can we do this? Reiffers? ...

6. SWINE DISTRIBUTION AND PAYMENT SCHEME: JAEC NOTED MISSION PREFERENCE FOR OPTION 1, WITH REPAYMENT IN-KIND, TO MAXIMIZE DISTRIBUTION BENEFITS AND ENSURE PARTICIPATION BY SMALLEST FARMERS. THE PP SHOULD DESCRIBE HOW THE PIGS WILL BE DISTRIBUTED FROM THE SECONDARY MULTIPLICATION CENTERS TO THE SMALL FARMERS AND HOW THE FARMERS WILL PAY FOR SWINE PURCHASES. A COST-RECOVERY SCHEME SHOULD BE ESTABLISHED WHEREBY PAYMENTS FROM SALES OF PIGS AND RELATED INPUTS SHOULD BE REINVESTED TO FURTHER THE OBJECTIVES OF THIS PROJECT. THE PP SHOULD OUTLINE HOW THESE REFORMS WILL BE MANAGED AND WHAT INSTITUTION(S) WILL BE RESPONSIBLE FOR THIS TASK.

7. SELECTION AND FUNDING OF LEAD INSTITUTION: WITH RESPECT TO THE SELECTION OF THE PROJECT GRANTEE, AND IN ACCORDANCE WITH AID HANDBOOK 13, THE MISSION SHOULD ENSURE COMPLIANCE WITH ALL APPLICABLE REGULATIONS AND PROCEDURES. (THIS APPLIES TO THE SELECTION OF PVGS FOR DISTRIBUTION ACTIVITIES AS WELL.) THE MISSION IS ENCOURAGED TO CONSULT WITH THE SLA ABOUT ANY QUESTIONS REGARDING THESE GUIDELINES. IN ADDITION, WHEREAS THE PP DID NOT INCLUDE FUNDING FOR ADMINISTRATIVE COSTS OF THE SELECTED IMPLEMENTING AGENCY, THESE COSTS SHOULD BE BUDGETED FOR IN THE PP FINANCIAL PLAN.

8. RELATIONSHIP TO IDA PROGRAM: MISSION STATED THAT, SINCE THE IDA PROGRAM IS STILL VERY MUCH IN A DESIGN STAGE, EXPERIENCE UNDER THIS INTERIM PROJECT COULD BE VALUABLE TO IDA AND GCH IN DESIGNING LARGER FOLLOW-ON PROJECT. MISSION IS ENCOURAGED TO PURSUE THIS OPPORTUNITY TO THE MAXIMUM EXTENT POSSIBLE.

9. USE OF TITLE II COMMODITIES IN SWINE RATIONS: TAKING INTO CAREFUL CONSIDERATION THE POLICY ISSUES SURROUNDING THE USE OF TITLE II COMMODITIES IN SWINE RATIONS, THE PP SHOULD DISCUSS THE FEASIBILITY OF USING THESE COMMODITIES FOR THIS PURPOSE. IF APPROVED AT THE APPROPRIATE AGENCY LEVELS, PROJECT FUNDING SHOULD BE SOFTENED TO REFLECT THE SUBSTITUTION OF TITLE II COMMODITIES FOR ADOX FUNDS CURRENTLY BUDGETED FOR FEED.

10. IEE REQUIREMENT: THE MISSION SHOULD FORWARD TO AID/W AS SOON AS POSSIBLE THE PROJECT IEE FOR REVIEW AND APPROVAL BY THE L/C CHIEF ENVIRONMENTAL OFFICER. THE MISSION IS REMINDED THAT THE PROJECT CANNOT BE AUTHORIZED UNTIL THE IEE HAS BEEN APPROVED.

11. PROJECT FUNDING: AS MISSION AWARE, FUNDING FOR THIS PROJECT HAS NOT YET BEEN IDENTIFIED OR earmarked. WE ARE HOPEFUL THAT FALL-CUTS IN OTHER PROGRAMS WILL BE IN AN ORDER OF MAGNITUDE TO ACCOMMODATE THIS PROJECT AND OTHER COMPETITIVE PRIORITIES. WE WILL KEEP THE MISSION APPRISED OF DEVELOPMENTS. SHULTZ

BT

76444

INIT ENVIRONMENTAL EXAMINATION

Project Location

Haiti

Project Title

Interim Swire Repopulation
(AID 521-0170)

Funding

\$2,503,000

Life of Project

FY 83-84 (PRCD FY 85)

IES Prepared by

James J. Talbot, RE-MS/C

James J. Talbot
Date: 21 June 1983

Environmental Action Recommended:

Negative Determination

Concurrence:

Harlan H. Hoggood
Harlan H. Hoggood
6/23/83
Date

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D C 20523

LAC/DR-IEE-83-37

ENVIRONMENTAL THRESHOLD DECISION

Project Location : Haiti

Project Title and Number : Interim Swine Repopulation
521-0170

Funding : \$2,503,000

Life of Project : Two years

IEE Prepared by : James Talbot, REMS/CAR

Recommended Threshold Decision : Negative Determination

Bureau Threshold Decision : Concur with Recommendation

Copy to : Harlan Hobgood, Director,
USAID/Port-au-Prince

Copy to : Robert Otto, LAC/DR

Copy to : James Talbot
USAID/Port-au-Prince

Copy to : IEE File

James S. Hester Date *7 July 1983*

James S. Hester
Chief Environmental Officer
Bureau for Latin America
and the Caribbean

DESCRIPTION

USAID/Haiti is addressing the problem of repopulation of Haiti's swine herd in the aftermath of Hispaniola's mobilization to eliminate African Swine Fever (ASF) from the island by destruction of the island's entire swine population. The creole pig in Haiti has served two major roles: as protein and as capital for the rural farmer. The need, now that both of these have been removed by PEPARED's eradication program, is to get pigs back into the farmer's hands as quickly as possible.

The IDB is preparing a project to repopulate Haiti with swine but the first pigs will be delivered to the farmers until 1987. USAID/Haiti is proposing a two-year, \$2.5 M interim swine repopulation project to introduce improved breeds of pigs to Haiti by 1984.

The mission will implement the project through IICA, Winrock International, Heifer International or a similar organization already familiar with livestock production in Haiti; such an organization is not yet identified. 500 gilts and boars will be imported under sanitary conditions and will reproduce over a two-year period, gradually becoming acclimated to Haitian conditions. Swine will be bred in leased facilities and distributed to the small farmers who participated in the eradication program. Some limited training will be provided and, funds permitting, the national animal health laboratory will be organized to improve its diagnostic capability. The project is a short-term effort, with the last pigs being distributed in mid-1985.

SCOPE OF ENVIRONMENTAL ISSUES

Two issues are considered as pertinent to the proposed project and are discussed herein. Mitigative measures and ways in which the project proposes to deal with these issues are also discussed. Social aspects will not be discussed since a detailed Social Soundness Analysis will be conducted during preparation of the Project Paper.

Availability of Improved Breeding Stock

The project will attempt to introduce more improved swine varieties to Haiti's pork producers. Important considerations in choosing pig breeds for use in such a breeding program in Haiti include: scavenging ability; adaptability/hardiness/survival ability; structural soundness; growth rate/feed efficiency; prolificacy; mothering ability; and conformation. The chief concern here is with adaptability of the new breed since Haitian swine raising practices and disease and parasitic infection will stress the population. The introduction of "feedlot" traits is an additionally linked concern affecting survival since Haitian farmers provide only on-farm residues and will rarely, if at all, provide dietary supplements such as grain to their pigs. Scavenging skills thus would be highly advantageous.

Since the goal of the project is to provide pigs to farmers, have them survive, perform and reproduce reasonably well, and have them resemble the old creole pigs in factors such as color and stature, breeds which exhibit the above traits will be selected for importation and use in the

breeding program. For gilts, Yorksnires will be imported for Duroc, Spotted and Yorksnire. Other specific criteria have been established in Annex I of the PID. Further elaboration of the breeding program will be found in the PP. Selection of these breeds should mitigate any negative consequences of harsh environmental conditions or traditional cultural practices encountered once the improved breeds reach the farmer.

Tick Vector of ASF

The Problem: ASF is usually an acute but occasionally subacute or chronic contagious disease characterized by blotchy skin cyanosis and extensive hemorrhages in the internal organs. Mortality in the acute form of the disease is usually 100%. Bush pigs, warthogs and giant forest hogs undergo inapparent infection and then serve as carriers of the virus which may be transmitted by ticks of the genus Ornithodoros. ASF resembles acute hog cholera, but the ASF virus is completely unrelated. In general, ASF spreads by contact (pig-pig), by contaminated food (virus on food-pig eats garbage) and by the tick (ASF infected pig-tick carries virus-infects healthy pig).

Some basic considerations about the tick life cycle should first be reviewed. All of the following information was confirmed by Dr. Jerry Butler, University of Florida, who has been studying ticks and ASF transmission for several years. Soft-bodied ticks of this genus are burrow dwellers during the day, feeding on mammals at night when they migrate out of their burrows, 1-8 meters away, to find a meal. Their life cycle is highly variable: adult ticks usually reproduce every 1-2 years, or live longer to reproduce, or live 11-12 years without feeding.

The species of tick found in Hispaniola is similar to species found in Spain and Africa which do carry ASF and which do transmit it to domestic swine. However, during the course of a short survey conducted by Dr. Butler at sites in Haiti where pigs were being held for eradication, ticks found at these sites were not carrying the virus. In the lab, when ticks are exposed to ASF virus, they can pick it up. Dr. Butler concluded at a recent scientific meeting (Animal Disease Conference, Orlando Florida, 1965) that these ticks would serve as a good reservoir for ASF and that if enough ticks were found and examined ASF carriers would be found. Dr. Butler estimates the chances of finding an infected tick to be somewhere around 1 in 1,000. But it has not been determined that ticks of this species on Hispaniola carry ASF at the moment. Many argue that pigs and ticks were not in contact long enough for ASF to be transmitted to ticks by infected pigs. Others argue that if pigs and ticks were only intermittently in contact during the active ASF cycle, there is still a high potential threat that ticks will carry disease. The way different groups view the threat of ASF from ticks, i.e. the manner in which the disease is vectored, affects the entire eradication/repopulation program. IICA takes the former position; Dr. Butler takes the latter.

Anywhere one finds the second situation of contact, one loses control of the disease eradication program; Spain and Africa serve as ready examples. Recently, industry's response in a developed country taken of control of the

-3-

Separate the pigs from the ticks. Since there are no other options to control ASF in a country such as Spain heavily invested in the swine industry and its accompanying infrastructure, one restricts access of pigs from ASF carriers and from people who want to raise pigs in their backyard.

In the context of a tick vector scenario, reinfection of the swine herd might look as follows:

- (1) Pigs and ticks are in contact during the ASF Phase
- (2) Pigs are eradicated by PAPPADEP
- (3) Ticks retain ASF, feed on other mammals in interim or go without feeding (as has been observed)
- (4) Pigs are reintroduced, ticks reinfect some individuals which reinfect others or send infected meat outside the small locus to other areas.

Viability of ASF, however, is influenced by the tick life cycle. For example, ASF virus is transmitted through tick of Ornithodoros. Therefore, assuming an infected tick lives only one year and reproduces, ASF can be transmitted in this manner for up to eight years. Further evidence that there is depletion of the viability of the virus with time mitigate this fact, but it is not known how much virus viability loss occurs with time and with each successive generation. With luck the pigs and ticks can be kept separated long enough to reduce any existing ASF in the tick population.

Mitigation Measures: Three options exist for consideration to mitigate negative effects of reinfection of the repopulated swine herd.

- (1) No reintroduction of pigs.
- (2) Reintroduction of pigs but only to restricted areas where pig and tick separation can be maintained
- (3) Given the risk of reinfecting pigs with ASF from ticks, reintroduce pigs into the system and monitor/evaluate whether or not transmission will occur. If it is found, it can be isolated and treated accordingly.

Option (1) is not practicable given the needs of the rural poor and momentum of pig reintroduction program such as with the IDB. Option (2) which is being tried now in Spain, places restrictions on who gets to keep pigs. Thus, the rural poor would suffer since only large operations could develop such "quarantine" capabilities. Option (3) is the most practicable and cost-effective. The sentinelization program carried out through IICA could be a logical mechanism to monitor/evaluate pig-tick interaction since a program of regional stations where non-infected pigs will be placed can serve as a study center.

Final evaluation of pig-tick interaction must be both intensive (e.g. feeding, closely at behavioral ecology, rates of infection/transmission, etc) and extensive (e.g. take a regional approach to cover as many different

-4-

situation as possible). The services of a Medical Entomologist would be required for the LOP and basic laboratory and field equipment should be provided this person. A high cost option would be to contract for professional services, in which case such an evaluation would run nearly 10% of project budget for such FA. A low cost option would be to contract a short-term advisor and one graduate student, the latter who would implement the monitoring/evaluation component. In this case, study cost could be reduced to less than 1% of the project budget.

EVALUATION OF PROPOSED PROJECT

Based on the above considerations, the activities proposed by USAID/Haiti will improve overall delivery of pigs to rural farmer and a Negative Determination is recommended. However, because of the potential threat of reinfection with ASF by soft bodied ticks of the genus Ornithodoros a monitoring/evaluation program is recommended as a minimum condition for implementation of this project. Further, a medical entomologist should be assigned to the PP team to assist in better defining the scope of work of this subcomponent.

EPIZOOTIOLOGY OF ASF

Introduction. African swine fever (ASF) is a contagious, acute to chronic febrile viral disease of swine characterized by high fever, hyperemia of the skin, abortions, edema and hemorrhages in many internal organs, especially the lymph nodes, with a high mortality rate. It is caused by a deoxyribonucleic acid (DNA) virus of the family iridoviridae (Fenner, 1976). Other members of this family are the lymphocystis virus of fish, frog virus 3 and the iridescent viruses of insects which share common physical and chemical properties. However, ASF is not serologically related nor does it share a common host range with any of the other iridoviruses. Swine are the only mammals found to be naturally susceptible to the disease (Came and Dardiri, 1969).

To date, there is no available safe and efficient vaccine to ASF. In Africa, warthogs and perhaps giant forest hogs and bushpigs serve as virus reservoirs (Detray et al., 1961). In Africa and southern Europe ticks of the genus Ornithodoros also are reservoirs and play a role in the transmission of the disease (Sanchez Botija, 1963; Plowright et al., 1969). Specific antibodies to the ASF virus develop in infected and recovered animals, but they do not neutralize the virus. Most recovered pigs are virus carriers (either symptomatic or asymptomatic) for longer periods, perhaps for life (Detray and Scott, 1957; Handy, 1983).*

Epizootiology of ASF in Africa. The first full description of ASF was given by Montgomery (1921) in which he described the clinical signs, pathological lesions, disease epizootiology and the possible mechanism of transmission.

In Africa, the ASF virus infection is well adapted to the African wild pigs in which it causes no outward clinical signs of disease. It was only when domesticated European swine were introduced into this environment that ASF occurred and the causal virus was revealed. Montgomery quickly established that the warthog (Phacochoerus oethiopicus) and bushpig (Potamochoerus species) were likely reservoirs of the disease. The means whereby the disease was transmitted from them to domestic pigs was difficult to explain because contact exposure proved ineffective. Therefore, he postulated that ingestion of infected warthog tissues (i.e. offal) might be the means of infection. Up to 1957, ASF was confined to the continent of Africa, where cases have been reported from Kenya, Tanzania, Malawi, Rhodesia, Zambia, South Africa, Mozambique, Lesotho, Dahomey, Senegal, Angola and Algeria (Detray, 1963; Neitz, 1963; Scott, 1965). The last ASF epizootic was in Cameroon. In 1982, ASF occurred in Cameroon and wiped out 80% of the swine population in few months.

*Presentation to the coordination committee meeting of African Swine Fever and Swine Development in Haiti; Port-au-Prince, July 13-15, 1983

ASF Outside Africa. In 1957, however, the disease was first reported on a farm near Lisbon Airport (Ribeiro et al, 1958). Feeding of swill prepared from airlines waste was considered to be the source of infection (Coggins, 1974). A "stamping out" policy was carried out; all pigs infected and exposed were killed, and this was considered successful. After 2 years, however, ASF reappeared near Lisbon and in 1960 it spread to Spain (Anon, 1961). In 1964 ASF was reported in Southern France (Larenaudie et al, 1964) and this and its reappearance in 1967 and 1974 in the same region were thought to be an extension of the disease from Spain. Italy, in 1967, became the next European country to report ASF (Hess, 1971). In 1970, the disease suddenly appeared in Cuba (Oropesa, 1971) where it was initially misdiagnosed as hog cholera. In these last 3 countries a slaughter policy followed by efficient cleaning and disinfection of contaminated premises led to successful disease eradication. Emergency eradication measures in Cuba were rapidly and decisively applied. Reportedly, all of the more than 400,000 swine in the province of Havana were killed, even though some were miles from any known source of the ASF virus.

The movement of swine and pork was restricted and feeding raw garbage to swine was not allowed. By August 1971, ASF had been eradicated from Cuba and no recurrence was reported until 1980, when a new ASF outbreak occurred which was traced to infected pork carried by Haitian refugees. This outbreak was also eradicated. This efficiency in eradication is in contrast to the situation in the states of the Iberian Peninsula, where the disease is not only currently enzootic but also a possible source of infection to other countries.

Although the virulence of the virus has decreased progressively since it was first introduced, the number of outbreaks in Spain and Portugal increased in 1977. This region probably was the source of infection to the Western Hemisphere in 1978. ASF was first recognized in Brazil in May 1978, when samples of swine tissues were submitted to Plum Island Animal Disease Center (PIADC) for diagnosis: ASF was confirmed (Gibus et al., 1978). This was followed by recognition of the disease in Sardinia, Malta and in the Dominican Republic in July 1978 (Peritz, 1978).

In Malta and Sardinia, initial outbreaks were reported in swine fed uncooked garbage from sea ports. Although the source of ASF virus to Brazil and the Dominican Republic has not been conclusively established, it is generally believed that garbage containing uncooked pork off airplanes from Spain or Portugal was responsible, since initial outbreaks occurred in swine fed uncooked garbage from international airports (Reichart, 1978). This was approximately six months before it was recognized as ASF and by the time it was declared, the disease had spread throughout the country. Samples of swine tissues from nine different locations throughout the Dominican Republic including the frontiers were submitted to PIADC in July 1978 and they were all positive for ASF. The initial outbreaks existed in herds where acute infections were predominant with high mortality rate. After these herds were wiped out, subacute and even subclinical infection became predominant and the mortality rate decreased sharply.

In Brazil, intensive measures were taken to reduce the disease's incidence, in the hope that the number of outbreaks would continue to decrease until eradication was achieved. It was estimated that the direct costs of the program in 1978 amounted to some \$13 million. In addition, \$25 million was appropriated by the government to provide working capital to the processors, subject to normal bank conditions and to verification that producers had been

paid pre-established reference prices. A further US \$25 million was set aside by the government for the purchase of pork carcasses from those processors who could prove that they had paid producers the pre-established reference price.

The initial diagnoses of ASF in Brazil were made in herds in which the acute form of the disease predominates and the mortality rate was high. After these herds were wiped out, subacute and subclinical infections prevailed. Mortality rates sharply decreased, and in some instances, the disease seemed to disappear without applying a drastic slaughter program. Under such circumstances, those who made the early diagnosis were faced with the embarrassment of trying to explain what had happened (Hess, 1981). Currently, ASF is enzootic in at least several states of Brazil.

In the Dominican Republic, where the pig population decreased from 1.5 million in January 1978 to 0.7 million in July 1979 (when phase I of that country's radical eradication campaign was initiated with financing from a USAID loan), the cost of the campaign included \$7.6 million in indemnities paid for 292,000 pigs sacrificed as an item of the control measures applied. An estimated 145,000 pigs were also slaughtered for consumption, in addition to an unknown number of unregistered deaths.

In December 1978, diagnosis of ASF was confirmed in Haiti after submission of swine tissue samples to PIADC. Early in January, 1979, Haiti was officially declared infected.

In Haiti, where 85% of the rural families maintain an average of between 4 and 40 swine, pigs provide the major source of protein of animal origin for the rural population, as well as being an important source of cash income. A program was carried out between July and September 1978 to eliminate the pigs along the Dominican border in an effort to prevent the spread of the disease. In spite of this effort, ASF was detected in the Artibonite Valley of Haiti in December of that year. Of an original estimated pig population of 1.5 million pigs before the outbreak, 300,000 had succumbed to the disease by October 1979.

The disease then spread to all parts of the country. In spite of the efforts made to control the disease, technical personnel were constrained by the lack of funds to indemnify farmers and carry out efficient control procedures. The ASF eradication program that started officially on September 15, 1981 is now coming to an end. Depopulation and indemnification activities were completed and the sentinelization stage is now underway.

The explosive ASF epizootic in Haiti, although hard and severe in the economy has nevertheless produced some positive results:

- (1) The capacity to recognise a new ASF outbreak or that of another devastating swine disease. The alert veterinarians could be instrumental in providing rapid diagnosis of such pigs before further spread could occur;
- (2) the establishment of a diagnostic laboratory.
- (3) training in animal health administration;
- (4) training of technicians in quarantine measures; and, more generally,

(5) Development of good working habits by Haitian employees.

These dividends will pay off in the execution of the interim repopulation project.

Early February, 1980, ASF again appeared in Cuba. It was traced to have been brought in with food carried by refugees from Haiti. The average mortality rate of the 1980 ASF apizootic in Cuba was approximately 30 percent (Mussman, 1980 cited by Hess 1982). An eradication program was followed through and Cuba is currently free of ASF.

In 1982, ASF occurred in Cameroon and wiped out 80% of the swine population in few months.

In 1983, ASF gained entrance to Italy, presumably through Sardinia. ASF has never been reported on the North American continent, nor in Asia nor Australia. Economic studies by McCauley and Sunquist (1979) indicate that eradication of an outbreak of ASF in the United States would cost between \$7.5 million and \$558.6 million depending on its size. If eradication were not successful, the cost to U.S. consumers would be \$2 billion the first year.

The ASF Vector. The possibility of a vector being incriminated in ASF transmission was first investigated by Montgomery (1921) who found that the ASF virus was not transmitted by fleas or lice. The latter was also disregarded by Heuschele and Coggins (1965) although Lotija and Badiola (1966) showed that Haematopinus suis was perhaps a mechanical vector. Walker (1933) postulated that perhaps a winged vector could carry the virus from warthog to pig, but this hypothesis was strongly questioned when it was found that "paddocking" of pigs was an effective method of controlling ASF (Detray, 1963; Pini and Hurter, 1975). Attention has been paid to hard ticks which were found on warthogs but Rhipicephalus spp., Ambylonma spp. and Ixodes spp. have been shown not to be important (Detray, 1963; Heuschele and Coggins 1965; Plowright, 1977). The argasid tick Ornithodoros moubata which was found in warthog burrows was investigated (Detray, 1963), but did not yield the virus.

Interest in this species was rekindled when Lotija (1963) recorded that ASF was recovered from Ornithodoros erraticus ticks which he found in piggeries in Spain. This argasid tick could be infected by feeding on viraemic pigs, retain the virus for up to 12 months, and pass on infection by feeding on susceptible pigs. It was two years later that Heuschele and Coggins, working in Kenya, showed that Ornithodoros moubata was also capable of transmitting the virus.

Further work on the role of the warthog and the transmission between wild and domestic pig was reported by Plowright et al. (1969), who demonstrated that in the Serengeti area of Tanzania, 71% of warthogs were infected. The virus was recovered largely from lymph nodes, with a low level of viraemia being detected in only two cases. Thus it was difficult to explain how up to 40% of the warthog burrows contained infected ticks, when ticks had to ingest blood with a virus level of 10^3 - 10^4 mean hemadsorbing units (HAD50) before the infection persists (Plowright et al., 1970). Blood meal identification had shown warthogs to be the primary source of blood meals for Ornithodoros moubata with antbears (Orycteropus afor), porcupines (Hystrix spp.) and lynae being alternative hosts (Pierca, 1974). It was postulated that these alternative hosts may circulate enough virus to infect the ticks, or that

perhaps an adequate viraemia occurred in young warthogs, where a high mortality is known (Jarman, 1970). However, once it was shown that trans-stadial (Plowright et al., 1969), transovarial (Plowright et al., 1970) and sexual transmission (Plowright et al., 1974) of the virus occurred in Ornithodoros moubata, there was no real need for a vertebrate host for primary infection. These observations led to the hypothesis that the ASF virus is originally a tick virus and the infection to the pig was accidental.

While this hypothesis is acceptable for the Serengeti area, in Uganda the situation is less clear; almost all warthogs two years old had ASF viral antibodies while infected ticks were found in only two of 46 burrows investigated (Plowright, 1977). Further problems also arose when outbreaks of ASF in domestic pigs occurred at around 9,000 feet above sea level, since O. moubata had not been detected above 6,150 feet above sea level. (Pierca, 1974) The difficulty of established a source of infection for outbreaks of ASF in South Africa was recorded by Pini and Hurter (1975), and in some instances they considered warthog ofial to be the source, although one outbreak may be attributed to infection carried by O. moubata.

Ornithodoros ticks were collected from Haiti and were classified as Ornithodoros puertoricensis, but no wild collected ticks to date have been found to carry the ASF virus in USDA-PIADC transmission trials. However, it was established that both O. puertoricensis and O. tyricata (collected from Florida) are capable of biologically vectoring ASF, and have also shown the virus for ASF reoccurrence in Haiti.

Future outbreaks. The source of any future ASF outbreaks would likely be:

- (1) Left-behind, infected pigs that had escaped the depopulation effort of PEPPADDP. Even if the pig looks healthy, recovered swine remain carriers of the virus and make the disease eradication extremely difficult. Movement of these live pigs, especially if these pigs experienced stress by farrowing, infection with other diseases, movement, adverse climatic conditions, or effluent from the premises may initiate a new outbreak. To solve this potential problem, DARDNR may be encouraged to continue surveillance through their veterinary services organization.
- (2) Left-behind infected pork or pork products that were stored in the cold, refrigerator or freezer, that have not been consumed, and that have found their way, uncooked, to susceptible pigs. Again DARDNR should take interest in following up with this task.
- (3) Reintroduction of the virus through intercontinental movement of unsterilized pork products (salami, sausages, and hams) carried by travelers, aircraft or ships. The garbage from these found its way to pigs in the cases of Brazil, the Dominican Republic and Cuba.

The entry of the ASF virus must be prevented. The practice of feeding garbage which may contain table scraps and pork trimmings capable of carrying ASF should be stopped. Neither fresh nor cured pork products should be introduced into an ASF-free area, even if only for human consumption. Cured pork and pork sausages are especially hazardous since the curing process is not likely to deactivate the virus (Kercher, Hess and Handy, 1978).

PEPPADDP is currently training personnel in seaport and airport quarantine, but

it is not certain what the future of those trainees will be once PIPPADEP closes its operations. LARDER should take the lead to employ them in positions for which they were trained, and constant surveillance should be implemented.

Infected Ticks. Ticks infected with ASF virus have not been found yet, in spite of the limited effort that has been made by PIPPADEP in tick surveys. Some three hundred ticks collected in Haiti and tested for infection with the virus have so far been negative. Approximately half of these tick samples reached PIADC dead. Live ticks have been found susceptible to the virus and are potential vectors for disease transmission, and are thus able to transmit the virus.

As the incidence of ASF-infected ticks decreases, the probability of its detection obviously decreases. It is likely, therefore, that the aforementioned negative results represent nothing more than a failure to detect a low incidence of infected ticks due to a small sample size. For example, in a hypothetical tick population with a 0.1% ASF virus infection rate, the possibility that several hundreds of ticks were negative is to be expected. To rule out the infection at this rate with a reasonable degree of confidence, many thousand ticks are required to be collected, properly preserved, and tested before an accurate assessment is achieved. Also the number of locations from which ticks are collected is also important. The number of these locations should be large enough in order to enable us to make inference of results with high degree of confidence. There is no way to predict whether or not the ticks will create a problem in the swine repopulation. We have no way of knowing without further study whether ASF-infected ticks even exist, much less whether they achieve the densities and other conditions necessary to initiate an outbreak.

It was established that both Ornithodoros puertoricensis (collected from Haiti) and O. turicata (from Florida) are capable of biologically vectoring ASF and it was also demonstrated that the ASF virus infects the salivaries and the ovaries of the ticks (Butler, 1982). Research on transovarian transmission and longevity of ASF virus infections in the ticks is continuing.

This information imposes a significant question as to whether or not the Ornithodoros ticks in Haiti might provide a reservoir of ASF virus in the absence of swine for a period of time which might permit recrudescence of ASF when Haiti is repopulated. The theoretical link in the chain of pig-tick-pig is present. The probabilities are the only imponderables. This question takes one quickly from the theoretical aspects of the repopulation project to the promising reality at hand with experience in the Dominican Republic.

The two sides of the island of Hispaniola have similar conditions regarding this matter. Since the beginning of the sentinelization phase in the Dominican Republic, which started approximately three years ago, no incidence of ASF has occurred. With the increase number of swine population (now currently 175,000 pigs) and the absence of ASF evidence in the DR, we are encouraged to state that future problems through ASF tick transmission in Haiti seem less likely.

By no means is this meant to relax concern about future ASF outbreaks. On the contrary, one should expect them, develop plans to recognize them instantaneously, contain them, and mobilize the resources necessary for early

eradication and for implementing the already spelled-out series of eradication activities. Therefore we recommend that, during the activities proposed in this project, a serious monitoring and evaluation program should be an integral part of this project. This could be efficiently performed through by a medical entomology student and a short-term consultant. The graduate student will be assigned to

- (1) Study the role of soft ticks in ASF virus transmission in Haiti.
- (2) Receive training in the best methods to collect, preserve and ship ticks for further study, bleed pigs, and collect proper swine tissue samples.
- (3) Give special emphasis to areas and premises where positive pigs were found (a list will be provided).
- (4) Make continuous and serious efforts to collect large volumes of ticks from potential infected sources.
- (5) Collect blood samples from pigs located in these areas during the interim project, deliver them to the diagnostic laboratory, and follow through with the results obtained.
- (6) Courier ticks to PIADC for testing. Results have to be sought from PIADC. Because of the lack of animal isolation facilities in Haiti, PIADC is the only place that can do the testing for the ASF virus in ticks.
- (7) Consider that ASF virus infected ticks do exist, until there is conclusive proof that they do not, and efficient acaricide treatment should be applied. This treatment will also help controlling other tick-borne diseases.

There are a few other important considerations as well:

Diagnosis. Because of the lack of a safe and effective vaccine, drastic slaughter and quarantine methods are required in controlling and eradicating ASF. The effectiveness of these procedures has been demonstrated in France, Italy, Cuba and South Africa. In each instance, the country is to be commended for its forthright and successful application of the eradication procedures. However, the French performance is cited as the model to aspire to in combating ASF, for it clearly demonstrated the efficacy of close surveillance, early diagnosis and rapid destruction of infected and exposed swine. The disease was eradicated in France on two occasions, with the loss of only 5,000 pigs at a cost of less than \$500,000.

In Italy, 100,000 pigs were destroyed with an estimated cost of \$5 million; in Cuba, 1971, the disease cost approximately \$25 million and the loss of 460,000 pigs. Early diagnosis and the quick destruction of infected and exposed pigs in France accounts for the difference.

Several forms of the disease occur. The following quotation best describes the problem in ASF diagnosis: "The diagnosis and control of ASF has been complicated in recent years by the appearance of new clinical forms of insidious, low mortality varieties with symptoms and lesions of lesser severity. There are no characteristics which cannot be observed

in, or confused with, other pig diseases". (Sanchez Botija, et al, 1977 cited by Hess, 1981). The disease cannot be diagnosed in the field and submission of proper specimens to the laboratory is essential. For an early diagnosis, certain conditions have to be met, through understanding of the epizootiology of the disease and the country's points or areas of vulnerability. The farmers and animal health personnel must be constantly alert to the potential threat, and immediately recognize and act on any unusual health problems arising their pigs. The farmers are not likely to become alarmed when only a few animals sicken and the symptoms are mild. Yet that is when the disease must be detected if it is to be contained and prevented from becoming a major disaster.

These milder forms of ASF, which are now seen much more frequently, pose a greater threat of not being recognized (Nebus and Darin, 1979). This is due to several reasons:

- (a) Many deaths do not occur within a short period of time, which may diminish an immediate concern.
- (b) A low mortality rate may decrease the chance of necropsy, but these dead pigs are most likely to demonstrate suggestive lesions of ASF.
- (c) Pigs that die later in the course of the disease may have chronic lesions of pleuritis, necrotic pneumonia, pericarditis, arthritis, skin ulcerations, and enlarged lymph nodes, which may not be recognized as lesions of ASF. Spleen and lymph node enlargement is due to hyperplasia rather than engorgement.

There should be a general awareness of vulnerable areas. Close surveillance should be maintained and all swine disease should be reported. Blood and tonsil biopsies from affected live pigs and blood and tissues from dead pigs should be immediately submitted to the diagnostic laboratory for examination.

The maintenance of a properly equipped laboratory staffed with technicians who are skilled in conducting the various tests that may be required to establish ASF diagnosis and a variety of other swine diseases. It must be emphasized that no single test can be expected to detect the disease under all conditions and rapid diagnosis is of prime importance. Speed, convenience, accuracy, and sensitivity are considerations in selecting the diagnostic procedure.

Diagnosis. The direct immunofluorescence test (Henschele et al. 1966) in tissue specimens from suspect animals or cell cultures inoculated with materials from suspect animals and the Hemadsorption test (Nalmquist and Hay, 1960) are the main tests for virus isolation and identification. Detection of specific antibodies by the immunoelectroosmophoresis (Pan et al, 1972), the indirect immunofluorescence test (Sanchez Botija and Orci 1977) and the Enzyme-linked immunosorbant test (ELISA, Handy and Dardiri, 1979, 1980) are the most efficient tests. The latter two have the combination of high levels of specificity and sensitivity. The ELISA has an additional advantage of being applicable to mass testing and automation (Kandy et al, 1981).

The cost of ASF varied tremendously from country to country, depending primarily on the rapidity with which the diagnosis of the disease was made and the implementation of control measures initiated. At one extreme, France, where the disease has been introduced on two occasions, rapid diagnosis and

prompt eradication procedures resulted in the expenditure of less than half a million dollars for the whole eradication effort. At the other extreme, Spain and Portugal have been unable to mobilize the resources necessary for eradication and for instituting control activities. Control measures are very costly in the case of Spain, for example, having averaged over \$14 million annually between 1967 and 1976. In Portugal losses in 1977 amounted to nearly \$48 million in addition to other losses suffered by affected farmers in that year. Proper disposal of garbage from international airports and sea ports to prevent consumption by swine will greatly reduce the international spread of ASF.

General Recommendations. It is recommended that the project document call for:

- (1) Formulation of a coordination committee with representatives of DARDNR, USAID, the project executing agency, and private animal breeders. This committee should meet at intervals to review the plans and progress of the project and help in solving major problems that are faced by the executing agency.
- (2) Development of a contingency plan agreed upon by all the institutions involved--USAID, DARDNR, PEPPADEP and the Executing Agency. This plan should spell out procedures to be taken to mobilize resources for recognition, containing and eradicating an ASF outbreak or a devastating other swine disease such as hog cholera before it spreads. USDA/APHIS will be happy to review this plan and make recommendations for its implementation. The plan should cover the following main points:

Introduction of swine or pork products from areas affected with ASF is prohibited to prevent the introduction of the disease. Should ASF occur again in any part of the country, the policy should be to eradicate the disease, impose immediate quarantines on infected and exposed premises, slaughter infected and exposed swine, dispose of carcasses by burial and burning, and proper cleaning and disinfection of the premises.

Garbage from ships, land vehicles, and aircraft which may contain meats or pork products should be prohibited entry or disposed of in a safe manner. ASF is readily spread by garbage containing meat scraps from infected swine which is consumed by swine.

Movements of people should be restricted only in relation to quarantined areas and premises during an epizootic.

The baggage of all persons entering the country from ASF-infected countries should be subject to close inspection.

Reporting of ASF and other contagious disease should be mandatory and failure to do so should be punishable by fine or imprisonment. Every swine owner and veterinarian as well as other must be held responsible for immediate reporting any illness suspect of ASF or other communicable disease. Such reports should be made to the Veterinary Services of DARDNR.

In addition to prompt imposition of effective quarantines and immediate establishment of inspection procedures for the purpose of checking all possible contact animals, the prompt disposal of infected and exposed animals and thorough cleaning and disinfection of affected premises constitute the surest means of combatting the disease.

Establishing contacts between institutions that have interest in the success of the project, such as the administration of DANON, veterinary services and staff, the senior staff of the Animal laboratory, and animal breeders, is a necessary and useful step. Discussions with them, their familiarity with the project document, and their input are a matter of good public relations.

A sizable amount of money for a contingency fund (\$50,000 - \$100,000) should be appropriated. This money will be spent on emergency needs that will face the entire project and cannot be met by any other institution. A portion should be set aside for laboratory equipment and supplies to promote the diagnostic capabilities of swine diseases, to pay incentives for national employees, fellowships for training of laboratory personnel, short term consultants and travel funds.

Delivery of new pigs will be conditional on the success of the ASF eradication program and the survival of the sentinel pigs which should maintain a negative state for ASF and other major swine diseases.

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July 1983
Port-au-Prince, Haiti

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**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Life of Project: From FY 83 to FY 85
Total U. S. Funding 3,000,000
Date Prepared: August 1983

Project Title & Number: Interim Swine Repopulation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes: (A-1) To raise standard of living of the poor Haitian farmers who were most affected by the ASF epidemic.</p>	<p>Measures of Goal Achievement: (A-2) -Improvement in health status. -Increase in income.</p>	<p>(A-3) -Project evaluations -Project Reports -JPIP</p>	<p>Assumptions for achieving goal targets: (A-4) -New pigs are accepted by farmers and are able to survive under local conditions. -Current demand for pig meat is as high as the pre-ASF level. -No hyperdeflation in the economy -No major disease spread.</p>
<p>Project Purpose: (B-1) To repopulate and improve the Haitian pig breeding stock.</p>	<p>Conditions that will indicate purpose has been achieved: End-of-Project status: (B-2) -Extension Service program fully functioning. -Better quality pigs fetching higher prices on the local market.</p>	<p>(B-3) -Project evaluations -Project reports -Audits -JPIP</p>	<p>Assumptions for achieving purpose: (B-4) -Farmers accept advice of Extension Service agents and dispose of resources to carry it out. -Local consumers accept the taste of the new pig stock. -No reoccurrence of ASF.</p>
<p>Project Outputs: (C-1) -Pigs distributed to poor farmers. -Establishment of breeding centers.</p>	<p>Magnitude of Outputs: (C-2) -Approx 4,700 pigs distributed to at least 50,000 farm families over a period of two years. -55-70 regional, secondary breeding centers fully functioning as swine husbandry demo. sites.</p>	<p>(C-3) -Project reports -JPIP</p>	<p>Assumptions for achieving outputs: (C-4) -The target group is easily identified. -PVOs dispose of the necessary resources to establish the regional, secondary breeding centers.</p>
<p>Project Inputs: (D-1) -452 high-quality breeding pigs imported. -two experts (short-term, swine production/extension) contracted. -2 vehicles, 1 truck procured. -4,000 tons of feed procured. -Lease HAMPCO facility</p>	<p>Implementation Targets (Type and Quantity) (D-2) -JPIP -Project reports -Adults</p>		<p>Assumptions for providing inputs: (D-4) -Procurement of supplies occur on schedule. -AID funds received on schedule.</p>

DRAFT PIO/T FOR COOPERATIVE AGREEMENT

Purpose. The purpose of the Cooperative Agreement between AID and the Inter-American Institute for Cooperation in Agriculture is to provide for the implementation of the USAID-funded Interim Swine Repopulation Project (521-0170). The objective of this project is to re-establish Haiti's pre-eradication hog population at the peasant farm level as quickly as possible. At the same time, the project should upgrade swine husbandry practices at that level so that the potential of the upgrade breeds to be introduced there can be realized. This two-sided objective will be pursued by the co-operator:

- (1) the leasing, through this agreement, of a nucleus swine breeding center (here in after 'NBC') from the Haitian American Meat and Produce Company (here in after 'HAMPCO');
- (2) the importation of 452 breeding swine (432 gilts, 20 boars) to be bred out over a two-year period at the NBC;
- (3) the management of this NBC breeding operation through the leased services and inputs and technical assistance provided through the Agreement, such that the maximum number of breeding grade F₁, gilts and boars can be placed for systematic multiplication purposes at Secondary Multiplication Centers (here in after referred to as 'SMCs') around the country;
- (4) the provision of these SMCs with, in addition to the F₁ breeding stock, adequate extension services and, when available, material inputs, so that they can multiply out the largest possible F₂ generation of piglets both during and beyond the life of the project;
- (5) the supervision of these SMC operations such that at least half of the F₂ piglets bred there are placed for breeding purposes with those farmers most dependent on the contribution of swine production to their savings and revenue opportunities; and
- (6) the animation of these SMC operations as swine husbandry demonstration centers so that these swine-dependent peasants farmers will adopt practices best suited to the health and reproductive success of the breeder pigs placed with them.

Period of the Agreement. The Agreement will be effective and obligation made as of the date indicated on the cover sheet and shall apply to expenditures made by the recipient in furtherance of program objectives through the expiration date set forth on the cover sheet. The Agreement may be extended beyond the estimated completion date indicated on the cover page.

Background. Very recently USAID has taken responsibility for providing Haiti with an Interim Swine breeding program to be underway by the time that the country is declared free of the African Swine fever. This program will provide 452 U.S. pigs (420 gilts and 32 boars) to a nucleus breeding center (NBC) to be operated in a piggery, leased under the same project, from the Haitian American Meat and Produce Company (HAMPCO) in Port au Prince. Pigs for breeding at secondary multiplication centers (SMCs) throughout rural Haiti will be chosen from the offspring at the NBC and distributed to those SMCs

meeting the technical, organizational, and development specifications for receiving them. These SMCs will receive, in addition to a predetermined number of breeder pigs, technical assistance, vaccine and some feed, pending its availability, from the USAID-funded program.

The Role of the Cooperator. The grantee will assume administrative and technical responsibility for executing this repopulation program on schedule. USAID funding under the co-operative agreement will provide for:

- (1) the services of a swine production specialist for two years to direct and manage all operations into, in, and out of the NBC;
- (2) The services for 20 months of a swine extension specialist to be responsible for coordinating all inputs to the SMCs;
- (3) up to two person-years of short-term technical assistance (including emergency veterinary help) on an as-needed basis;
- (4) the services for two years of selected local-hire extension personnel;
- (5) 452 breeder pigs procured competitively from the US;
- (6) a two-year lease for HAMPCO's pig production facility in Port-au-Prince;
- (7) the services of the laborers to be assigned to this facility;
- (8) US procurement of two personal vehicles to be assigned to the technicians, and one truck, with a two-ton payload, equipped to transport pigs;
- (9) 4,000 tons of pig feed;
- (10) Evaluation and monitoring inputs; and
- (11) Administrative and operating costs.

Technical Assistance. The two full-time expatriate employees to be funded under this project will manage the project and provide technical assistance. IICA/Haiti's permanent in-country staff will administer and coordinate the project.

This 24-month project is designed to get the maximum number of pigs into the hands of the small Haitian farmer as quickly as possible. For this reason these full-time technical assistants will have line management as well as advisory responsibilities. Short-term technical assistance (23 months) and local-hire extension support (48 months) will be funded to support their activities.

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Background. The Interim Swine Project is not a customary institutional development project, but rather a short-lived, 24-month, emergency development project which will:

fill the gap between the eradication of all Haitian pigs and the planned IDB-funded repopulation project;

reinforce and encourage the establishment of mid-level production units (swine multiplication centers, or SMCs) with NGOs, the GOH Faculty of Agronomy, and district agronomats; and

make pigs available to farmers through the SMCs.

To accomplish this within the 24-month period, within a fixed budget, the project must be managed and operated by technical personnel, hired through IICA, with previous experience in Haiti.

The project contemplates the use and services of two full-time technical advisors, a swine production specialist, and a swine extension specialist.

SCOPES OF WORK

- (1) Swine production specialist. He will be hired for 24 months. He should hold an MS or PhD in animal production and/or nutrition. He must have a minimum of five years experience in swine management and production, preferably in developing countries.

Duties and Responsibilities. The swine production specialist will be entirely responsible for the planning and implementation of multiplication activities in the Nucleus Breeding Center. The nutrition and health programs will likewise be under his supervision. The Swine specialist will control the number of visitors that can enter the breeding center, so as to control the introduction of diseases. He will make and post a set of rules by which the breeding center will be operated. He will select a foreman from within the NBC work force to conduct the daily activities there.

He will plan and coordinate all the activities necessary for the smooth distribution of the pigs to the secondary multiplication centers. These activities will include

the selection of gilts and boars at the nucleus center for distribution;

the selection of culled pigs for fattening;

coordination with USAID/Haiti, the project director and contract staff on the certification of available PVOs, NGOs, GOH entities, or private sector groups that may qualify for pig delivery;

coordinate with the project administrator to provide SMCs with TA in swine management, production, nutrition, and health;

schedule the transportation of pigs to SMCs;

determine what feed or protein supplements can or should be provided to SMCs; and

determine, in coordination with USAID/Haiti, which areas of the country should receive priority in pig distribution, based on the quantity and quality of feedstuffs available within the area as well as upon the pre-determined criteria for SMC selection.

He should supply, through IICA/Haiti, a monthly progress report of activities to the USAID project manager.

(2) The Swine Extension Specialist. He will be hired for 20 months, and should possess the following qualifications:

a degree or adequate experience in livestock development;

experience with agriculture extension and communication methods;

working experience in a tropical LDC environment;

personnel management skills and demonstrated leadership capability; and

a working knowledge of French and/or Creole.

Duties and Responsibilities. This person will be primarily responsible for working with potential SMCs, and applying USAID/Haiti's criteria for eligibility to receive pigs. These are

agricultural development experience in rural Haiti;

the financial and managerial capacity to set up an SMC farrowing barn;

a USAID/Haiti-approved distribution plan providing equal access to F₃ breeding pigs for the smaller Haitian farmer, without regard to his religious affiliation.

Other duties include the following:

helping USAID/Haiti with the selection of SMC management units pre-qualified to receive F₂ breeding pigs;

aiding these management units to prepare for the arrival of the pigs;

helping the SMCs to prepare a swine husbandry demonstration program;

helping with the swine distribution program from the NBC;

monitoring the statistics of the swine demography in each SMC and, when the time comes, the production and reproduction success of swine distribution from the SMC to the peasants;

preparing a monthly report on this monitoring of the project's progress towards its objectives;

supervising the project accounts, information system, and contract staff;
and

establishing an implementation plan with USAID and the contractor, and
filing quarterly reports of progress according to that plan.

(3) Short Term Technical Assistance (23 months)

- a. Veterinary
- b. Other

(4) Local-Hire Extension Personnel (48 person months)

PIG PURCHASE SPECIFICATIONS

1. Gilts

- (A) Total number. 420; Must have been born and raised on farm where purchased; Health Certificate must so state.
- (B) Gilts will be purchased only in groups of at least 50 animals, and must originate from a single swine production unit.
- (C) Approximate delivery dates:
 - 140 to be delivered the first month of the HAMPCO lease.
 - 140 to be delivered six weeks later.
 - 140 to be delivered five weeks later.
- (D) Transportation. Air transport non-stop from the country of origin to Port-au-Prince, Haiti. Transportation cost to be included in bid. Supplier to take full responsibility to see that shipment arrives early, no later than 10 pm.
- (E) Quality and Size:
 - (1) All gilts must meet standards equal to those for U.S. No. 1 feeder pigs.
 - (2) All gilts must be healthy and free from any genetic defects.
 - (3) All gilts must weigh between 100 and 140 pounds at time of movement into quarantine on the farm of origin, and be aged between 3-1/2 and 4 months.
 - (4) All gilts must have a minimum of 12 functional teats (6 per side).

NOTE: Gilts and boars will be inspected on the farm of origin at purchaser's expense by two AID representative specialists and one country of origin representative, who will be authorized by USAID or its representative to accept or reject any animal or the entire group if they fail to meet any of the above conditions.

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Gilts selected must be separated from the rest of the herd until laboratory results are available, and then be shipped to the export quarantine facility for shipment to Haiti.

The contractor must notify the purchaser by telephone or by telex at least 72 hours in advance so that arrangements can be made for inspection and selection).

(F) Breeds: The gilts must be Yorkshire or Yorkshire crossbred gilts showing predominately Yorkshire breeding. Importation must be from a country free of African Swine Fever and Hog Cholera.

(G) Health Requirements:

- (1) Gilts must originate from herds officially free of pseudorabies and brucellosis. The herd must be validated brucellosis-free, or the swine individually tested negative for brucellosis prior to entering quarantine in country of origin and all breeding animals in the herd six months of age or older are negative to an official brucellosis test conducted within thirty days of purchase.
- (2) In addition, all gilts must originate from herds which have had no history nor clinical evidence of the following diseases during the preceding twenty-four months: tuberculosis, septospirosis, erysipelas, transmissible gastro-enteritis (TGE), jaw abscess or cervical abscess, Glasser's disease, vesicular stomatitis, swine dysentery, mycoplasma pneumonia (Enzootic Pneumonia), and Atrophic Rhinitis.
- (3) On Farm Quarantine Requirements. The cement facility must be cleaned and disinfected before the start of the quarantine period, and must be located a minimum of one hundred feet from other swine pens. During the on-farm quarantine, the pigs must test negative for brucellosis (card test or tube test 1:25), pseudorabies (SN Test 1:4), tuberculosis, transmissible gastro-enteritis (TGE) SN-1:8), leptospirosis (pomona, canicola, hardjo, icterohemorrhagiae, and gryppothyphosa serotypes), and hog cholera. The specific date of test, results obtained, and name and address of the laboratory must be provided. The pigs must be treated for endoparasites and ectoparasites, and the date, type of product and dosage must be provided.
- (4) Pigs must meet the requirements specified in the form SV-001 except for the African Swine Fever requirements.
- (5) Pigs must have passed an export quarantine period of not less than ten days immediately before departure to Haiti. The quarantine facility must be approved by the veterinary services of the country of origin.
- (6) The pigs must be accompanied by a health certificate which includes the following: (a) the name and address of the exporter, (b) name and address of farm of origin, (c) name and address of buyer, (d) complete swine identification, with one official

ear tag in each ear, both listed on the Health Certificate, and (e) certification of the requirements for the country and herds of origin.

The country of origin must be free of foot and mouth disease, vesicular swine disease, hog cholera, African Swine Fever, and Teschen's disease.

The Health Certificate must be issued by a veterinarian licensed and accredited in the state or country of origin of the swine. The issuing veterinarian must have visually inspected the entire herd of origin and so state on the health certificate. The certificate must be endorsed by the official veterinarian in charge, and must show the laboratory tests results and type of treatments. If vaccinated, the name and type of vaccine and date of vaccination must be shown.

2. Boars

(A) The total number of boars will be 32. Boars of each breed must come from only one production unit. They must have been born and raised on the farm where purchased and the health certificate must so state.

(B) Delivery. The boars will be delivered according to the following schedule:

16 during the first months of the HAMPOO lease; and 16 six weeks later.

They will be delivered to the same address as the gilts. 16 boars will be delivered with each of the first two shipments of gilts. The transportation arrangements will be the same as for gilts.

(C) Quality and size. All boars must be purebred and registered in the appropriate breed association. All boars must be healthy and free from any genetic defects. Both testicles must be in the scrotum. All boars must have a minimum of twelve teats (six per side), and should not exhibit "sheath-nipples".

(D) Weight and age. Boars should be 4 to 5 months of age and weigh 140 to 130 pounds.

(E) Breeds. The first shipment must include boars of Duroc and Spotted Swine, eight boars of each breed. The second shipment must include Hampshire and Chester White, eight boars of each breed. All boars must be registered in the appropriate breed.

(F) Health Requirements. Same as for gilts.

All documents accompanying the animals shall be appropriate documents transferring ownership to the importer.

B. Lease guidelines.

C. Vehicles.

2 Jeep-like 6 passenger vehicles with: 4 wheel drive, 4 doors, 5-speed transmission, overload springs, gasoline engine, heavy duty tires, and air conditioning;

1 truck with gross vehicle weight of 10,000 lbs. including a 2 ton payload on a ten foot bed with livestock stacks (pig-size), V-8 diesel engine (460 cc), dual tires in rear, side boards, overload springs, and an air conditioned cabin.

D. Feed and Mineral Supplement (see Technical Analysis)

E. Equipment

F. Medicine

IV Miscellaneous

A. Evaluation

B. Entomological Monitoring (18 months)

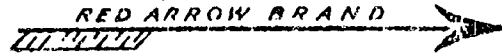
C. Laborers for the NBC

D. Personnel Support Costs

E. Other Direct costs

1. Production

2. Distribution



HAITIAN AMERICAN MEAT & PROVISION CO. S.A.

P. O. BOX 1105 · PORT-AU-PRINCE · HAITI · CABLE ADDRESS · HAMPCO · PORT-AU-PRINCE

PORCHERIE D'HAITI

I. AREA

5.75 acres entirely enclosed by eight foot concrete block wall.

II. SWINE BUILDINGS

Total 28 hog structures, semi-confinement, electrified, automatic waterers. Consist of two farrowing buildings, one nursery, barns for breeding herd (sectioned for gilts and open sows, gestation and boars). Boar pens equipped with automatic, programmable sprinkler/shower watering. Growing/finishing barns. Barn occupancy interchangeable.

Farrowing buildings have sufficient stalls for 400 sow operation.

Farrowing buildings and nursery building are fitted with "tenderfeet" (baby saver) elevated, perforated flooring.

All barns connected to cement pits for waste collection.

III. AUXILIARY BUILDINGS AND FACILITIES

One office building containing two offices, one small laboratory and toilet.

One welfare facility including showers and toilets for farm employees.

One incinerator.

Two feed mixing tanks, manual, open construction, cement.

LEASE COST PER CALENDAR MONTH - \$15,300; on 12-month lease.

HAITIAN AMERICAN MEAT & PROVISION CO. S.A.

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IV. ANCILLARY SERVICES/EQUIPMENT AVAILABLE

CHLORINATED WATER adequate for 5000 pig herd: \$350 per month. This is deep well water, chlorinated on site, tested four times yearly by certified U.S. lab. Meets USDA requirements for HAMPCO meat processing plant.

ELECTRICITY. Lessor will install one meter for electricity supplied by Electricite d'Haiti; charges to be paid by lessee. Lessor will install one meter for electricity supplied by HAMPCO via existing Caterpillar diesel generator. This is source of stand-by electricity for "black out" periods from Electricite d'Haiti. Lessee will be charged monthly, per kilowatt hour at 2.5 times local rate. (HAMPCO cost to produce electricity is approximately twice the cost of purchased electricity. HAMPCO must also provide generator maintenance.)

FEED DEPOT AND FEED MILL. Approximately 6000 square feet modern, cement construction depot. Feed mill facilities are in place and operating. Lease cost: \$4,100 per month.

MANURE WAGON WITH VACUUM PUMP AND DISCHARGE
"Clay" model. Requires one tractor to haul, 48 hp or higher. Size is adequate for daily removal of manure from cement collection pits connected to each hog building. Waste is spread as fertilizer on nearby farms. Lease cost: \$270 per month.

OFFICE TRAILER, 60' x 12', Model No. 6012FC. Furnished complete with carpeting and drapes. Modern including toilet, full heating/air conditioning. Divided into one general office, three private offices. Desks, chairs, filing cabinets, water cooler, etc. Lease cost: \$675 per month.

N.B. Above offering 's separable. Any, all or none of ancillary services may be included in lease.

CERTIFICATION PURSUANT TO SECTION

611(e) OF THE FOREIGN ASSISTANCE

ACT OF 1961, AS AMENDED

I, Phyllis Dichter, acting for the principal officer of the Agency for International Development in Haiti, having taken into account, among other factors, the maintenance and utilization of projects in Haiti previously financed or assisted by the United States, do hereby certify that, in my judgement, the Interamerican Institute for Cooperation in Agriculture (IICA) bureau in Port au Prince, Haiti has both the human resources and financial capability to maintain effectively and utilize the grant assistance project: Interim Swine Repopulation, project number 521-0170.

This judgement is based, among other things, upon the demonstrated experience of IICA in coordinating the eradication phase of the African Swine Fever project with PEPPADSP; its adherence to rigid professional standards in project implementation; its stated willingness to undertake the present project; and its history of cooperation with the Haitian Government in a variety of activities.



Phyllis Dichter
Phyllis Dichter
Acting Mission Director
USAID/Haiti

5c(1)- (XAMHS) (3/1/17)

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481. Has it been determined that the government of the recipient country has failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel to their dependents, OR from entering the U.S. unlawfully? No.
2. FAA Sec 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? N.A.
3. FAA Sec. 620(c)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? N.A.
4. FAA Sec. 532(c), 620 (a)620 (f)620D; FY 1982 Appropriation Act Secs. 512 and 513. Is No.

recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will Assistance be provided to Afghanistan or Mozambique without a waiver?

5. ISIXA of 1981 Secs. 724, 727 and 730. For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISIXA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727 and 730 of the ISIXA of 1981. N/A
6. FIA Sec. 520 (j) Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by negligent action of U.S. property? No.
7. FIA Sec. 520 (l) Has the country failed to enter into an agreement with PIC? No.
8. FIA Sec 520 (o); Fisherman's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters?
(b) If so, has any deduction required by the Fishermen's Protective Act been made? No.
9. FIA Sec. 520 (o); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds? No.

10. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be made to the annual "Taking into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OI." This approval by the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.) N/A
11. FAA SEC 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? No.
12. FAA Sec. 620(v). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taking into Consideration memo.) Haiti is not in arrears.
13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from or prosecution to, any individual or group which has committed a war crime? No.

Best Available Document

14. FAA Sec. 669. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA? No.
15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620L permits a special waiver of Sec. 669 for Pakistan.) No.
16. ISDA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. of Sept. 25 and 26, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? N/A
17. ISDA of 1981 Sec. 721. See special requirements for assistance to Haiti. Special requirements have been met.

B. FURTHER SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

2. EEA Sec. 115. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that No.

contemplated assistance will directly benefit the needy?

2. Economic Support Fund Country Criteria

- a. FAA Sec 502E. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest? No.
- b. ISLCA of 1981, Sec 725 (b) If ESF is to be furnished to Argentina, has the President certified that (1) the government of Argentina has made significant progress in human rights; and (2) that the provision of such assistance is in the national interests of the U.S.? N/A
- c. ISLCA of 1981, Sec. 726 (b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Govt. of Chile has made significant progress in human rights; (2) it is in the national interest of the Chile is not aiding international terrorism and has taken steps to bring to justice those indicted in connection of Orlando Letelier? N/A

DC (2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance Funds, B.2. applies to projects funded with Development Assistance Loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD TFM CHECKLIST BEEN REVISED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriation Act Sec. 523; FVA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) Country or international organization allocation reported to Congress (or not more than \$1 million over that amount)?

A congressional notification has been submitted.

2. FVA Sec. 611(c)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

Yes

3. FVA Sec. 611(c)(2) If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

N.A.

4. FAA Sec. 611(d); IS 1982
Appropriation Act Sec. 501 Is for
water or water-related land
resources construction, has
project met the standards and
criteria as set forth in the
Principals and Standards for
Planning Water and Related Land
Resources, dated October 25,
1973? (see AID Handbook 3 for new
guidelines.) N/A
5. FAA Sec. 611(c) Is project is
capital assistance (e.g.,
construction), and all U.S.
assistance for it will exceed \$1
million, has Mission Director
certified and Regional Assistant
Administrator taken into
consideration the country's
capability effectively to maintain
and utilize the project? N/A
6. FAA Sec. 209. Is project
susceptible to execution as part of
regional or multilateral project?
If so, why is project not so
executed? Information and
conclusion whether assistance will
encourage regional development
programs. No.
7. FAA Sec. 601(a) Information and
conclusions whether projects will
encourage efforts of the country
to : (a) increase the flow of
international trade; (b) foster
private initiative and
competition; and (c) encourage
development and use of
cooperatives, and credit unions,
and savings and loan associations;
(d) discourage monopolistic
practices (e) improve technical
efficiency of industry, agriculture
and commerce; and (f) strengthen
free labor unions. (a) yes, through satisfaction
of local food demand;
(b) yes, through individual
production units; (c) yes;
(d) yes; (e) yes; (f) no.
8. FAA Sec 601(b) Information and
conclusions on how project will
encourage U.S. private trade and
investment abroad and encourage
private U.S. participation in
foreign assistance programs
(including use of private trade
channels and the services of U.S.
private enterprise). Equipment and TA will be pro-
cured from U.S. (000)
sources.

9. I/A sec. 612(b); FY 1982 Appropriation Act Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.
10. I/A Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? **No.**
11. I/A Sec 501(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? **Yes**
12. FY 1982 Appropriation Act Sec 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. procedures of the same, similar or competing commodity? **N/A**
13. I/A 118(e) and (d) Does the project comply with the environmental procedures set forth in AID Regulation 10? Does the project or program take into consideration the problem of the destruction of tropical forests? **Yes**
Yes
14. I/A 121(c) If a Saram project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)? **N/A**

There is no government counterpart contribution to the proposed cooperative agreement.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project
Criteria

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

(a) distribution will be focused on smallest farmers; (b) cooperatives will be favored; (c) this will contribute to the development of a national swine industry.

b. FAA Sec. 103, 103A, 104, 105, 106. Does the project for the criteria fit the type of funds (functional account) being used?

Yes

c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?

Yes

Haiti is an RLDC.

d. FAA Sec. 119 (a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?

No.

e. FAA Sec. 110(b) Will grant capital assistance be disbursed for project over more than 3 years? if so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (A.O. 1232.1 defined a capital project as "the construction, expansion, equipping, or alteration of a physical facility or facilities financed by AID collar assistance of not less than \$100,000, including related advisory managerial and training services, and not undertaken as part of a project of a preponderantly technical assistance character."

Yes

f. FAA Sec. 122(u) Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

g. FAA Sec. 231 (c) Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

Importance of swine in the national economy is described at length in the body of the PP. Whenever possible, indigenous organizations will be utilized.

2. Development Assistance Project Criteria
(Loans Only)

a. FAA Sec. 122 (b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest. N/A.

b. FAA Sec 620 (c). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan? N/A.

c. ISICA of 1981, Sec. 724(c) and (d) If for Nicaragua, does the loan agreement require that the funds be used to the maximum extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624 (g)? N/A.

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a) Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of FAA Section 102? N/A.

b. FAA Sec. 531(c) Will assistance under this chapter be used for military, or paramilitary activities? N/A.

c. FAA Sec. 534. Will ESR funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives? N/A.

d. FAA Sec. 609 If commodities are to be granted so that sale proceeds will accrue to the recipient country, have special account (counterpart) arrangements been made?

N/A.

5C (3)- STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? **Yes.**

2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him? **Yes.**

3. FAA Sec. 604(c). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? **N/A.**

4. FAA Sec. 604(e), ISICA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) **N/A.**

5. FAA Sec. 501(c)(7). Will construction or engineering services be produced from firms of countries otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one or these areas?

N/A

6. FAA Sec. 603. Is the shipping excluded from compliance with requirement in section 901 (b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent that vessels are available at fair and reasonable rates?

No.

7. FAA Sec. 521. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and are available without undue interference with domestic programs?

Yes

8. International Air Transport Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available?

Yes

9. FY 1982 Appropriation Act Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?

Yes

B. Construction

1. FAA Sec. 601(d). If capital (e.g. construction) project, will U.S. engineering and professional services to be used? N/A.
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on competitive basis to maximum extent practicable? N/A.
3. FAA Sec. 620(is). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million (except for productive enterprises in Egypt that were described in the CP)? N/A.

C. Other Restrictions

1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter? N/A.
2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? N/A.
3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? Yes.
4. Will arrangements preclude use of financing.

- a. FAA Sec. 104 (1); FY 1982 Appropriation Act Sec. 525: (1) To pay for performance of abortions as method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; (4) to lobby for abortion? **Yes.**
- b. FAA Sec. 620(g). To provide training, or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? **Yes.**
- d. FAA Sec. 602. For CIA activities? **Yes.**
- e. FAA Sec. 336(1). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained? **Yes.**
- f. FY 1982 Appropriation Act, Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel? **Yes.**
- g. FY 1982 Appropriation Act, Sec. 505. To pay U.M. assessments, arrearages or dues? **Yes.**
- h. FY 1982 Appropriation Act, Sec. 506. To carry out provisions of IAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)? **Yes.**

i. FY 1982 Appropriation Act, Sec. 510. To finance the export of nuclear equipment, fuel or technology or to train foreign nationals in nuclear fields?

Yes

j. FY 1982 Appropriation Act, Sec. 511. For the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?

Yes

k. FY 1982 Appropriation Act, Sec. 515. To be used for publicity or propaganda purposes within U.S. not authorized by Congress?

Yes

AGENCY FOR INTERNATIONAL DEVELOPMENT

MISSION TO HAITI

July 21, 1983

For U.S. MAIL:

USAID / HAITI

Department of State

Washington, D.C. 20520

For INTERNATIONAL MAIL:

USAID / HAITI

P.O. Box 1634

Port-au-Prince, Haiti, W.I.

To Whom It May Concern:

Subject: Request for Expressions of Interest in
Secondary Multiplication and Distribution
of Pigs to Small Farmers in Rural Haiti

A. Project Summary:

For one year, beginning in mid-1984, USAID,¹ working with IICA² and DARNDR's³ PNRP,⁴ will be distributing pigs on a monthly basis out of Port-au-Prince. These pigs are to be placed in secondary multiplication centers (SMCs) throughout Rural Haiti and bred. Then the weaned piglets are to be sold, for no more than is necessary to recover the costs of the SMC and its operation, to small farmers capable of managing them for further breeding.

The objective of this project is to breed the most pigs in the least amount of time and distribute them to these Haitian farmers who have suffered the most from their eradication.

To assist in SMC management and subsequent pig distribution, approximately 25 organizations, public or private, based on their record of effective agricultural extension to the small Haitian farmer, need to be pre-qualified by USAID. One organization will be chosen for each of Haiti's 20 District Agricoles. A second organization will be selected for the five larger and more populous Districts.

B. Selection Criteria:

The choice of these participating local organizations will be made according to the following criteria:

- 1) a proven history of organizational and agricultural success in a community of small Haitian farmers;

-
1. United States Agency for International Development
 2. Instituto Inter-Americano das Ciencias Agricolas
 3. Département de l'Agriculture, des Ressources Naturelles et du Développement Rural
 4. Projet National de Reppeuplement Porcin;

- 2) good working relations with local authorities and local sources of agricultural expertise;
- 3) the technical and financial capacity to establish, maintain, and recover the costs of a pig SMC;
- 4) an expressed willingness to co-operate with the technical assistance being provided by USAID under this project;
- 5) the agronomic and organizational ability to use a SMC as a demonstration site to prepare local farmers for tertiary swine production;
- 6) existing agricultural extension links with the lower economic levels of Haitian farmers;
- 7) A record of having assisted the small Haitian farmer in improving his productivity, preferably, but not exclusively, in animal husbandry;
- 8) a commitment to be monitored, evaluated, and audited by USAID against the equity, impact and financial management criteria established by the project.

C. Implementation Plan:

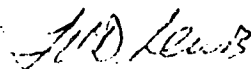
- 1) Once selected, by September 1983, these organizations, will be listed by name and locality in the project agreement documents. At this time each organization will commit itself to the construction of a SMC with a capacity of no less than 10 sows. If a larger SMC is built, the project may be - but cannot commit itself to be - in a position to supply the sponsoring organization with more than 10 sows at a time.
- 2) Each of the organizations listed in the project agreement will have to have their SMC and their demonstration/extension/distribution plan certified by the technical assistance team. However, any changes from the organizations listed in the project agreement will have to be approved by the USAID project manager. Any organization that was overlooked in the first selection process can submit a proposal outlining its SMC demonstration/extension/distribution plan. Pending the availability of pigs and depending on the location of the organization, it, should its proposal be acceptable, can be included on the list. Such decisions will also require the approval of the USAID project manager.

-3-

- 3) Once listed and certified each organization will be guaranteed two shipments of no less than 10 sows and 2 boars each. Subsequent shipments will be made, as determined by the USAID project manager, as a function of each organization's success with the first 10.

Thank you for your interest in and attention to this livestock development opportunity.

Sincerely yours,



John V.D. Lewis
Rural Development Officer

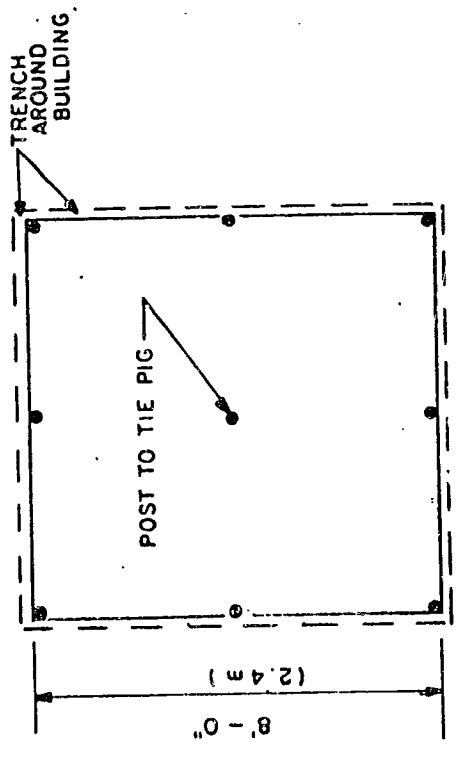
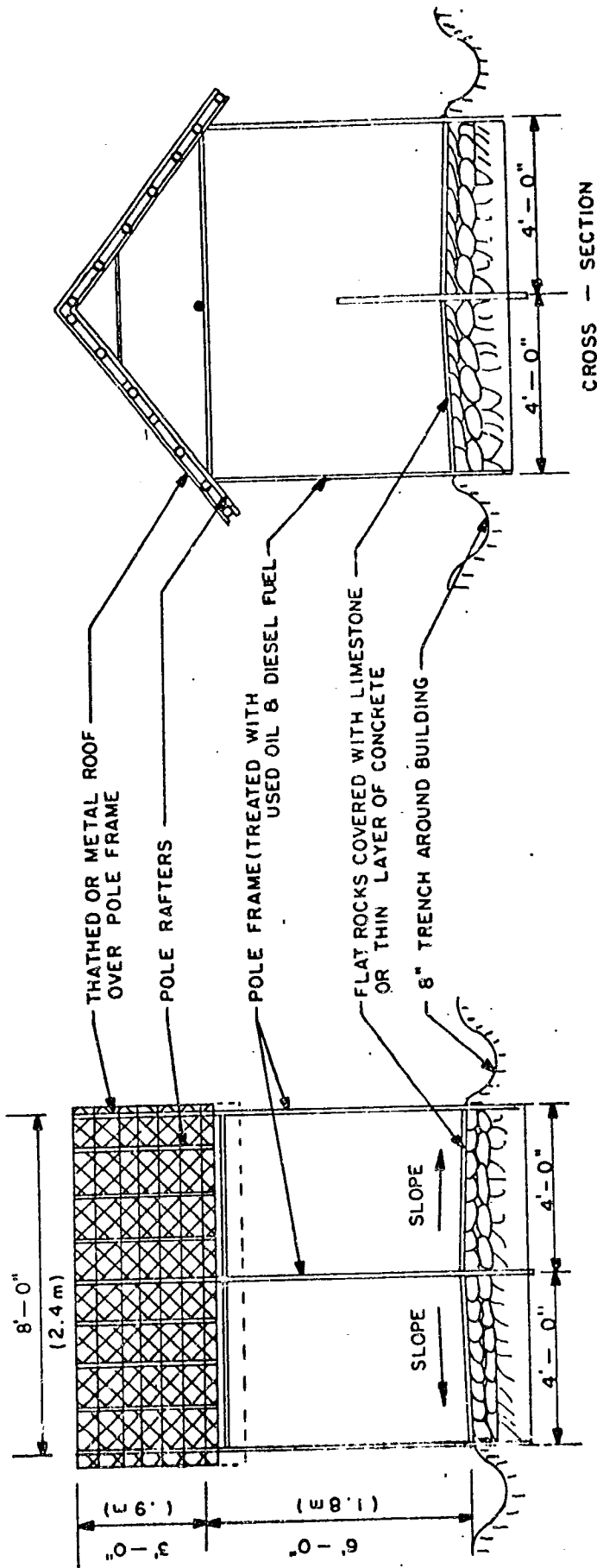
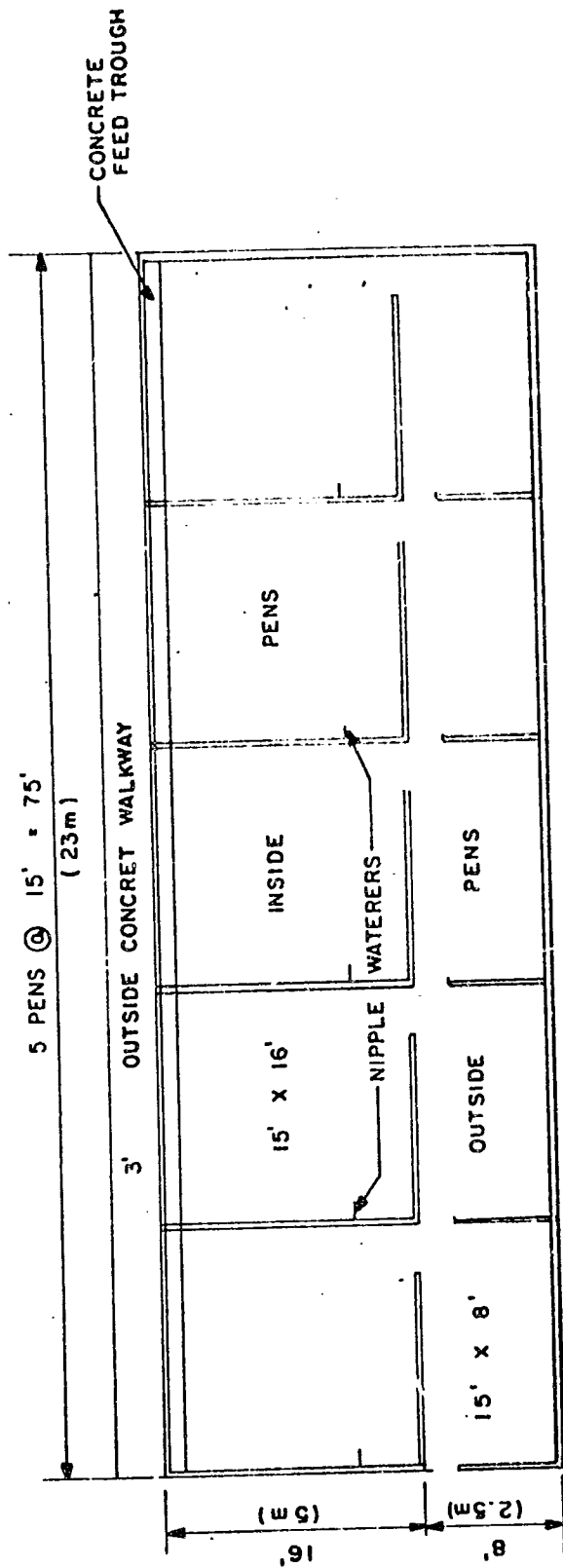


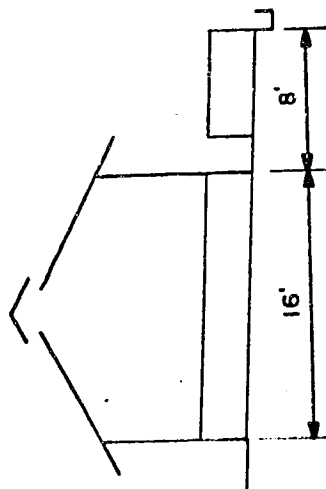
Fig. 16: PEASANT PIG HOUSING

SCALE: 3/8" = 1'-0"

SWINE REPOPULATION PROJECT: HAITI	
Drawn by: A. J. M. Traced by: W. P.	Page 12 of 22
PEASANT PIG HOUSING	
Date DEC. 1982	



PLAN



CROSS - SECTION

Fig. 21: SOW - NURSERY - FARROWING UNITS
(3 BUILDINGS)

SCALE: 1/8" = 1'-0"

SWINE REPOPULATION
PROJECT: HAITI

LES CAYES RENOVATION

Drawn by: A.J.M.
Traced by: W.P.
Date: DEC., 1982

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ONGs WORKING ON AGRICULTURAL DEVELOPMENT WITH SMALL FARMERS IN RURAL HAITI

<u>District Agricole</u>	<u>Section Rurale</u>	<u>Organization</u>	<u>Individual(s) sur Place</u>	<u>P. au P. Contact</u>
Jean Rabel	Jean Rabel	1.Monfortians-Com-pagnie de Marie	Frere Jean-Marie Vincent	R.P. Boniface Fils-Aimé, Maison Marie Reine des Coeurs, St. Louis de Turgeau 5-5262
Port-de-Paix	Port-de-Paix Passe Carabois	" 2.Union Evangeli- que Baptiste d'Haiti	Ben Loyer	1230 Tyrgeau B.P. 458 2-3960
Cap-Haitian	Le Borgne Vaudreuil Quartier-Morin	3.Petit Bourg la Borgne 4.Convention Baptiste d'Haiti (CBH) B.P. 20 Cap 5.Mission Baptiste, Centre Agricole	Willy Jean-Baptiste Rev. Phillip Unlinger Rev. Luc Joseph, B.P.I. Kenneth & Deborah Heneise	Wesleyan Church B.P. 1764 4-0141 Rev. Jack Hancox B.P. 2101, 2-5289, 7-6509
Cap-Haitian	Cap-Haitian	6.Rotary Club	Freres Salesiens	Foundation Vincent Grand Rue on R, S of Delmas.
Grand Riviere du Nord	Grand Riviere du Nord	7.Mennonite Economic Development Agency	David Cutrell	Paul Derstine MEDA R. Brown
Plaisance	Plaisance	8.Filles de Marie Notre Dame de Perpetuel Secours	Sister Desrouleaux: Dispensaire Plaisance	Bel-Air, 2-2543, 2-1047
Pilate	Pilate	9.MODECOP	Pere Pollux Bayas, Pero- isse St. Rose de Lima	Holy Cross, P.O. Box 1230 Turgeau

ONGS WORKING ON AGRICULTURAL DEVELOPMENT WITH SMALL FARMERS IN RURAL HAITI

<u>District Agricole</u>	<u>Section</u>	<u>rale</u>	<u>Organization</u>	<u>Individual(s) sur Place</u>	<u>P. au P. Contact</u>
	Cap-Haitian		10. Institute Diocesan d'Education d'Adultes (IDEA)	R.P. Yvon Joseph College de Notre Dame 03-20969	"
Fort-Liberte	Terrier-Rouge	11.	"	Pierre-Louis Delinx	"
	Ferrier	12.	World Hunger Relief Inc.	Ed Brentnam and Jammie Davis	
	Terrier-Rouge	13.	Missionnaires De Scheut (CICM)	Pere Joseph Debauw Pere Joseph Releman Pere Joseph Honore Pere Joseph Bergmans	R.P. Jan Berghmans 13 Morne St. Gerald Villa Mon Reve B.P. 1594, 2-0452
	Fort Liberte			Pere Francois Dierickx Pere Andre Vanderlinden	
	Grand Bassin			Alfred Charpentier	Rev. Mauril Rancourt 40 Ave. N B.P. 691-B 5-5654
	Acul Samedi				
	Valliere				
	Ouanaminthe	14.	Oblates de Marie Immaculee		
Hinche	Mt. Organise	15.	Co-op St. Helen de Carice (COSAHC)	Pere Raymond Marquis Pere Real Corrivean	"
	Carice				
	Thomasique	16.	Missionnaires de Scheut (ICM) Paroisse St. Thomas d'Acquin	Pere Marc Fizez and Sr. Martha Vanrompay	R.P. Jan Berghmans, 13 Mornest Gerard, Villa Mon Reve, B.P. 1594, 2-0452
	Maissade	17.	SHEEPA		Hugues Slyvain

ONGs WORKING ON AGRICULTURAL DEVELOPMENT WITH SMALL FARMERS IN RURAL HAITI

<u>District Agricole</u>	<u>Section Rural</u>	<u>Organization</u>	<u>Individual(s) sur Place</u>	<u>P. au P. Contact</u>
	Saltadere		Pere Jean Hoit	
	Salt la Source		Bill Quiggley	
	L'Hospalice		Raymond de Caluvre	
	Papaye	Centre "Emmaus de Papaye"	Jean Hanssens/Baselet Jean- Baptiste	
	Cerca Cavagal		Marcel Marchal	
	Mombin-Crochu		Jules Van Looveren	
	La Victoire		Paul Hanson	
	Pignon		Lievan Loga	
	Maissade		Guy Reynaerts	
	Ferme Papaye	18.DARNDR/Winrock	Ed Gears, Agr. Cleopate	DARNDR/PNRP
Gonaives	Gros-Morne	19.Centre de Dev- elopement Rural de Grepin	Marc Antoine Noel	Catholic Relief Services B.P. 947, 2-0654, 2-5066
	Bayonnias	20.Project Pilate de Groupements	Chavannes Jean-Baptiste	"
St. Marc	La Braule			Caritas/Gonaives Pierre
	Verettes	21.Project de De- velopement Rural de Verettes	Jean Paul, Pere Gilles	Salvetti, B.P. 2213-B
	Desarmes	22. Dominicains- Ordes des Freres Pechups	Pere Grandoit	"

ONGS WORKING ON AGRICULTURAL DEVELOPMENT WITH SMALL FARMERS IN RURAL HAITI

<u>District Agricole</u>	<u>Section Rurale</u>	<u>Organization</u>	<u>Individual(s) sur Place</u>	<u>P. au P. Contact</u>
	Borel	23. Church of God General Conference (Project HELP)	Fred Horne	Pierre Allen, B.P. 1744 2-3159, HELP, B.P. 2065
	Deschapelles	24. Hospital Albert Schweitzer	Bill Jackson	"
	Leschapelles	25. Mennonite Central Committee (MCC)		Eldon Stolfus, B.P. 2160, 6-1739
	Montrouis	26. Mission Possible	Jeff Palmer	Jack Synder, B.P. 134733, Delmas 6-0810
	St. Michel de l'Attalaye	27. Centre d'Etdue et de Co-operation Internationale (CECI)	Pere Paul Bouchard Paroisse de St. Michel	Scheuts
Mirebalais	Laschobas	28. Convention Baptiste d'Haiti (CBH)		Jack Hancox, B.P. 2101 2-5289, 7-6509
Belladere	Project Croix Fer	29. Comite Haitien- ne de Developpement (CHADEV)	Bernard Etheart	100 Ave. Lavartiarere B.P. 241, 5-1910
Port-au-Prince Nord	Thomazeau	30. (SBM) Strategic Baptiste Mission	Erick Lange	Mr. Erick Lange, B.P. 673

ONGS WORKING ON AGRICULTURAL DEVELOPMENT WITH SMALL FARMERS IN RURAL AITI

<u>District Agricole</u>	<u>Section Rurale</u>	<u>Organization</u>	<u>Individual(s) sur Place</u>	<u>P. au P. Contact</u>
	La Gonave	31.Church World Service (CWS)	Peter Graff	Rev. John Muilenburg Rev. Luc Garnier B.P. 285, 6-4321
	Anse a Galetes (La Gonave)	32.Wesleyan Mission (EWA)		Rev. Jim Vermilya B.P. 1309, 7-1624
	Archaie	33.Eglise Episcopale		Rt. Rev. Luc Garnier B.P. 1309, 7-1624
	Gathier			Mennonite Central Committee
	Fond Parisien		Pasteur Thomas	Baptists
	Bell Fontaine	34.Notre Dame de Lourdes		
Port-au-Prince Sud	Gressier	35.Action Mission- aire Globale Institut Chrétien de Technologie et d'Agriculture	Frank Arbaugh	Mrs. Jesse Skreeve, Mr. Nolbest, B.P. 493 6-2029 6-0335, Rev. Clyole Ben- der: Blue Ridge Christian Home Stuarts Draft, VA. 24477
	Leogane	36.Christianville Foundation	James Herget	Mr. James Herget, B.P. 1690, 2-0508
Jacmel	Jacmel	37.Plan de Parran- inage, Plan Inter- national	Charles Ames	Mme. Joy E. Greenidge B.P. 2193 PAP, Tel:61102 61438 Delmas 3
	Beloc	38.Missionary Out- reach		Rev. Richard Steele Dalton, GA

<u>District Agricole</u>	<u>Section Rurale</u>	<u>Organization</u>	<u>Individual(s) sur Place</u>	<u>P. au P. Contact</u>
	Marbial		Rev. Chas. Burton	Presbytere de Bainet
	Bainet	39.Paroisie Catholique de Bainet	Pere Parisrot Bill Buffum	Bainet, Jacmel Tel: 2-2043
	Morne a Bruler	40.GRD groupe de Recherche pourle Developement: Unite de Morne a Bruler	Daniel Michel	Mme. Philippe B.P. 1123 PAP 2-4253
	Vallee de Jacmel	41.CODEVA	Phillipe Luies Agr. Luc Pierre Jean	Institut Francais
Belle-Anse	Thiotte	42.CCH		Oblats
Petit-Goave	Peti-Goave	43.Wesleyans		Rev. James Vermilya B.P. 1764, 4-0141 B.P. Paul, 2-2976
	Violet	44.Inst. Chretien de la Vie Rurale	Rev. Marco Depstre	
Nippes	Miragoane	45.Project Madien- Salagnac, Feres de St. Jacques	Phillip Dierrexck Alex Bellarde Phillip Mathieu	c/o Cooperants Francais Tel: 2-3925, Michel Brouchet, CARITAS/CARITAS Presnor Poteau
	Valle de Plaisance	46.World Concern/ CRISTA		Rev. Louis Markwood Rev. B. St. Germain, B.P. 71 Cayes B.P. 1050 PAP Tel: 4-1284
Fond des Negres	Fond des Blancs	47.CODEPLA,	Dr. Bob Baker	Agr. Paul Thomas CEEH B.P. 2475 PAP, Tel:
		Christain Veterni-	6-4829	

ONGS WORKING ON AGRICULTURAL DEVELOPMENT WITH SMALL FARMERS IN RURAL HAITI

<u>District Agricole</u>	<u>Section Rurale</u>	<u>Organization</u>	<u>Individual(s) sur Place</u>	<u>P. au P. Contact</u>
Cayes	Torbeck	"	"	"
	La Borde	48.(DCCH) Develop- ment Communautaires Chretiens d'Haiti	Pere LeBeller	Rev. Louis Markwood Rev. B. St. Germain Soeur Marie Rose 2, Rue 6, 5-2544, 5-4444
	Cayes	49.World Team		
	Berault	50.Soeurs de Saint Francois d'Assise		
	Camp Perrin	51.Atelier des eco- les de camp Perrin	Jean Sprumont Jean Bernard Sugier	
	Renel, Chardon- niers	52.NICORS/CCH	Roger Hallee et.al Oblates	Rev. Mauril Rancourt 40 Ave. N Mailing: B.P. 13 PAP, C.P. 691-B PAP, 5-5654
	Jeremie	Gebeau	53.Methodist Church	Rev. Edward Domond B.P. 6, 2-2976
	Dame-Marie	Chambellan	54.Save the Child- ren Federation	Claude Boutillier 3 Ruelle Dancombe PAP Tel: 5-2102

ANNEX L: Bibliography

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