TERMINAL REPORT

Report #57

AGRICULTURAL DEVELOPMENT SUPPORT II
HAITI

University of Arkansas,
Fayetteville

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ADS-II

TERMINAL REPORT

Agricultural Development Support II Project

USAID Contract # 521-0092
between
University of Arkansas/Winrock International
and
Ministry of Agriculture. Haiti

Prepared by Technical Assistance Team

Report # 57
January 1987
Port-au-Prince. Haiti

ACKNOWLEDGEMENTS

The University of Arkansas and Winrock International technical assistance team as a group have felt priviledged to work in Haiti. The program scope of work set before us initially has evolved into exciting and we believe highly successful programs within the Ministry of Agriculture. The success enjoyed in program activities is a direct result of the dedication of highly motivated and competent personnel at all levels which the program was able to attract and retain over the past four years.

Visitors to the ADS-II offices at Damien as well as field offices in Les Cayes and Jacmel have often remarked about the "esprit du corps" of the various interdisciplinary team members, Haitian and expatriate, about a subtle feeling of hard to suppress excitement about work well done, of new and challenging programs underway.

Finally, the team has come to have a deep respect for the thousands of small farmers with whom we have worked, and of the special relationships established with farmers particularily in Haut Cap Rouge and Bas Cap Rouge, Jacmel, and in Maniche, Fonds des Freres, and Berault in the Les Cayes region. It is our particular hope that their lives will, in at least some small way, be better because of our involvement in Haiti.

Richard A. Swanson, COP, Anthropologist
Michael Bertelsen, National Survey Economist, Ag. Economics
Douglas Brown, Geographer, Geographic Information Specialist
Amal Chatterjee, Agronomist, FSR
Joseph N. Pierre, Agronomist, FSR
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AGRICULTURAL DEVELOPMENT SUPPORT II PROJECT # 521-0092

1.0 SCOPE OF WORK

1.1 Project Document (copied directly)(pp.1-4)

STATEMENT OF WORK

"The overall objective of the contractor is to assist the Haitian Ministry of Agriculture, Natural Resources and Rural Development (MARNDR) in strengthening its operational and administrative capacity to conduct and coordinate a national program of farming systems development and agricultural data gathering, processing, and dissemination.

By providing 206 person months of technical assistance to the Center for Research and Agricultural Documentation (CRDA), it is expected that the Ministry will be better equiped to (1) provide development and support services to the country's small farmers and (2) provide on a timely basis reliable information to the policy makers for the continued development of the agricultural sector. Performance period is forty-eight months.

A. Scope of Work

.....This four year project seeks...to rapidly develop improved technological recommendations for increasing the production of those crops that have the most favorable ecological effects balanced by good market potential and/or potential for improving rural nutrition levels. It is expected that through the TA to be provided, capability of MARNDR will be strengthed and upgraded to:

- execute a vigorous country wide program on on-farm demonstration/production of sound farming systems having special relevance to the small farmer;
- maintain on an on-going basis a reliable agricultural data base.

.....The contractor will also design and develop a relevant in-service and overseas training program for CRDA personnel. The off-shore component will consist of appropriate graduate level training and short term intensive specialized training at the (international) research centers and other regional institutions in the areas of small farm production, rational land use patterns, hillside farming, etc. In-service training will focus on the planning and operational aspects of adapting agricultural research and data gathering. Also, the team will assist the CRDA in developing programs for the delivery of alternative but economically viable cropping systems to the participating farmers through intensive farmer training activities.

The technical assistance team will utilize a collaborative and multidisciplinary approach in providing the required services to the Ministry of Agriculture. In so doing, each specialist will coordinate his responsibilities as necessary to assure the success of the project. The team will also be required to fully utilize

all relevant existing data gathered from previous or other on-going agricultural projects in Haiti, in pursuit of the objectives of the project.

Specifically, the technical assistance team will be charged with providing the following assistance to CRDA:

1. Assist in the diagnosis of constraints to small farm production and productivity;
2. Assist in the preparation and execution of an adaptive on-farm research program in cropping systems inclusive of a livestock component; to determine viable, economic alternatives to present production practices;
3. Assist in the formation of functional operative units having the capability of duplicating the strategy for developing improved farm production systems for other target communities;
4. Assist in the preparation of annual work plans and budgets (including precurements) for implementation of the project;
5. Assist in the formation of viable farmer organizations for technology adoption;
6. Assist in the preparation and establishment of an intensive in-service training program for farmers;
7. Assist in the preparation and execution of in-service training programs for recent graduates in agronomy and statistics;
8. Assist in designing and executing agro-socio-economic surveys;
9. Assist in the development of sampling frames, and the conduct of enumeration exercises;
10. Assist in developing appropriate training programs for data processing by computer;
11. Assist in the development of a viable program for acquiring agricultural information and its subsequent dissemination;
12. Assist in the establishment of training programs for CRDA personnel. The overseas training program will be comprised of sending approximately (60) sixty participants for specialized training in: (i) cropping systems; and (ii) surveys and data processing."

1.2 Project Paper Supplement #1

In Project Paper supplement #1 (prepared in August 1982 by USAID), two specific components were to be supported by the project:

(i) The Research and Extension Component ("on-farm adaptive and co-operative research", "research will develop alternative, adaptable, and economically viable farming systems..."(pp.2,3)); and:

(ii) The Rural Economics and Agricultural Statistics component ("to strengthen the institutional capability of MARNDR in gathering and monitoring agricultural data, data processing, data analysis and interpretation, identification of priority corrective measures; and implementation and evaluation of the identified interventions" p.4).

Regions chosen by MARNDR and USAID in which the FSR component of the project was to work were "Les Cayes in the South and Jacmel in

the Southeast of Haiti" (p.13). Furthermore, "each region will be further sub-divided into two representative farming communities with one located on the plains and the other on the hillsides..."(p.14). Note: technical assistance team had no part in the choice of the regions or sub-regions in which to work.

1.3 University of Arkansas Technical Proposal

The University of Arkansas and Winrock International (as sub-contractor) responded to the RFP for this project with a proposal (See ADS-II Publication # 1) on how technically and administratively they believed this project could best be executed. Because this was the winning proposal, a brief summary of our proposed procedure to execute the project and orientation is in order.

To quote from the proposal, "The general project strategy consists of three sub-processes: (a) farming systems research, (b) agriculturl information gathering and analysis, and (c) training. In this proposal, these processes are often discussed separately, but it is a basic project premise that the three processes complement each other and must be effectively coordinated as an integrated strategy" (p.14). This strategy became the over-riding orientation of the technical assistance team. Unfortunately, the strategy was poorly understood by USAID project officers backstopping the project, resulting in misunderstanding and occasional lack of support to the team.

The Contractor proposed to:
1. "Design more productive agricultural techniques responsive to key contraints in Haitian small farm agriculture and developed in cooperation with Haitian farmers to guarantee their superiority and their acceptability;
2. Develop operational and administrative capacity to conduct on-going applied agricultural research responsive to small farmer environments, characteristics, and needs;
3. Develop an agricultural information system that genuinely represents the farming systems extant in Haiti in terms of both the major policy-relevant data items and data collection procedures appropriate for the Haitian small farm environment;
4. Maintain sensitivity to at least two community and regional aspects of agricultural development in Haiti. These are the urgent need to address the problem of erosion and the need to keep the agricultural marketing system in focus in agricultural development schemes"(pp 5,6).

The contractor outlined 4 central points in its project philosophy which have guided the technical assistance team over the past four years. These were:

1. "Integrated Approach. Integration of disciplines is central to the Farming Systems Approach chosen. Integration of applied research, training, and <u>information system development</u> is also an important element of the design.

2. Detailed Project Conceptualization. Rather than focusing primarily upon the prior identification of quantitative, measurable objectives, the project emphasized detailed conceptualization of the process, with opportunity for appropriate documentation, evaluation, and intervention at key points.
3. Detailed Documentation. The project will emphasize detailed documentation of the development process to improve communication among project participants, to facilite project evaluation and improvement and to assist in building institutional capability.
4. Bottom-Up Process. The project will emphasize developing new agricultural technology, building an agricultural information system, and training agricultural technicians, all based upon farmer participation and extensive use of the detailed information about Haitian farming systems that the project itself acquires in the field" (p.6).

1.3.1 Proposed Field Implementation of Farming Systems Component

The technical assistance proposal clearly outlined the steps which we have taken in initiating the farming systems program in Les Cayes and in Jacmel. Technical assistance was limited to restricted areas in these regions with positive applied research and extension results benefiting mostdirectly these areas. As stated in the proposal "one advantage of farming systems research programs is that there is no clear distinction between the generation of technology (research) and its diffusion (extension). In FS programs, technology transfer begins almost immediately" (p.19). To impact farming systems methodology and orientations to other parts of the country, the best the project could expect was dissemination through a vigorous training program to as many young agronomists as possible; who would in turn apply their newly acquired skills as they were assigned by the Ministry to other regions of the country. Dissemination of applied research results would depend on some further concentrated extension/media efforts outside the target areas both during and after the project. By the end of the project, the design and implementation of a National Farming Systems Research and Extension System could be planned for year 5 and beyond (see Fig.1 flow chart).

1.3.2 Proposed Field Implementation of Rural Economics and Statistics Component

It was consistant with project philosophy to begin work within this component through "experience with agricultural information gathering and analysis, done to support the farming systems activities, (to) serve as a basis for the design of a national level information gathering and analysis system" (p.16). Furthermore, the strategy implemented was based on the understanding that "the design of a national information gathering, processing, and dissemination system will be an output

Fig.2

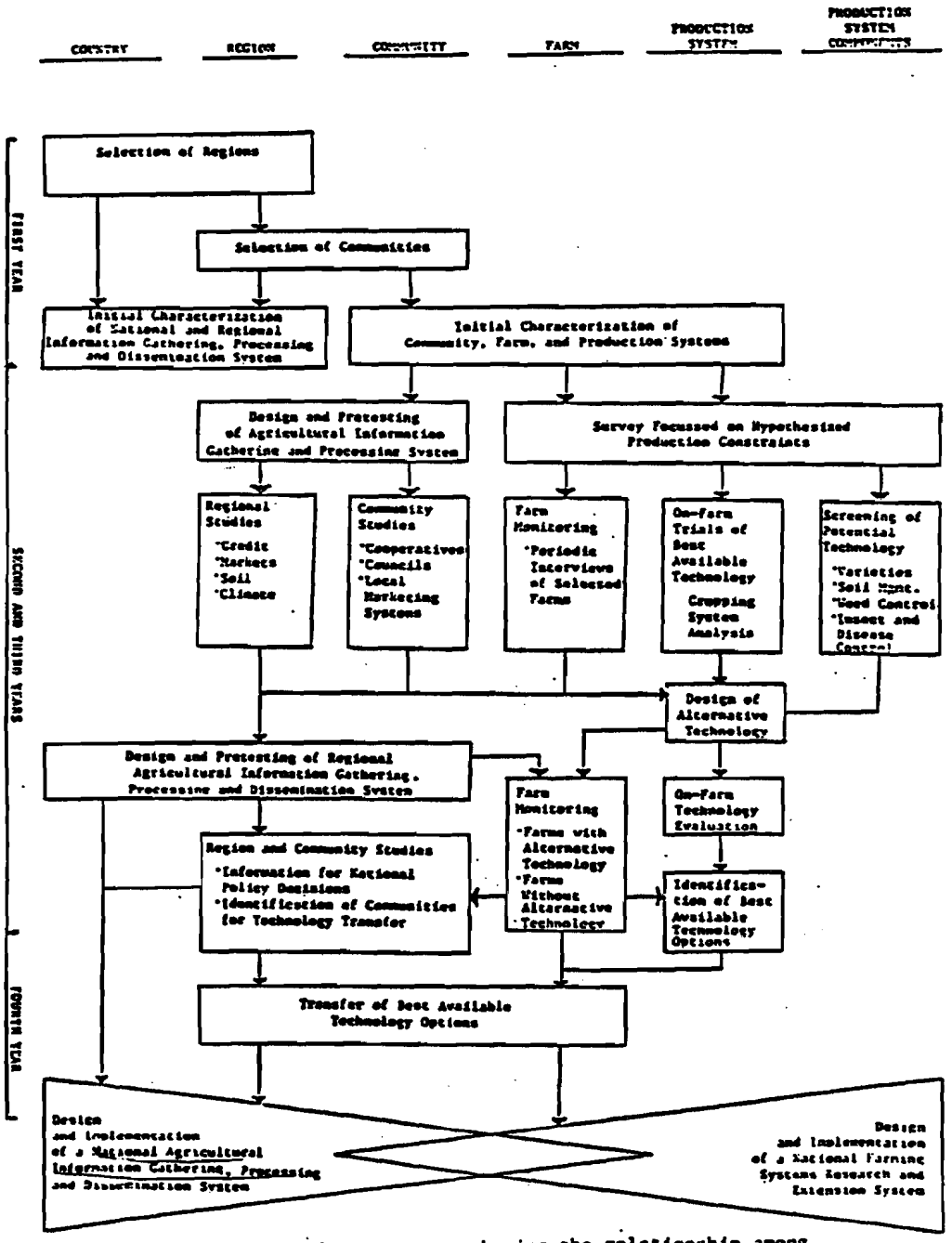

Figure 2. Integrated project strategy showing the relationship among activities directed at different systems along a hierarchy from the country to the production system level, and the general chronological relationship among activities.

SOURCE: A Technical Proposal for Technical Assistance in Support of the Agricultural Developement Support II (ADS II) Project No. 521-0092 (p.17).

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of the project; it will not be designed in Port-au-Prince and implemented top-down during the course of the project. The national system would evolve based on the experience of the farming systems activities" (p.21) and move through four phases, terminating at the end of the fourth year with a trained enumeration, data processing, analysis staffs, and tested survey instruments. By the end of the project, the two departments within which the FSR activities were implemented, would have been surveyed using the national-level questionnaire forms which were developed out of the farming systems rural economics program. The design and implementation of a National Agricultural Information Gathering, Processing, and Dissemination System could be planned for year 5 and beyond (see Fig.1, flow chart).

The project began and operated within this plan of activities for the first year and a half, at which time, events beyond program personnel control led to major program modification. One major change involved a transfer by Minister of Agriculture Flambert of the project out of its University of Haiti, University Faculty of Agriculture (CRDA/FAMV) offices (constructed at project expense) to new space in the main Ministry building, where new offices again had to be constructed. As such, our formal ties with CRDA were severed. A second major change followed the Minister's demand, and USAID's concurrance, that the rural economics and statistics component "go national" as quickly as feasible -rather than by year 5 as programmed.

2.0 Personnel

2.1 Long Term Technical Assistance

The University of Arkansas contract budgeted for four (4) long term technical assistance personnel and a total of 186 person months (PM) of short term technical assistance. Two long term technicians were placed into the Rural Economics and Statistics (RES) and Farming Systems (SP) components of the project, respectively.

During the life of the contract, the scope of work was substantially increased by USAID and Ministry of Agriculture insistance, without accompanying project ammendments or significant budget increase. Project ammendments were repeatedly requested by University representatives as early as 1985. The increased scope of work however did lead to authorization by USAID to place a junior agricultural economist in Les Cayes to assist the rural economics part of the farming systems program there. We were also permitted to add a programmer/information systems analyst position in Port-au-Prince to assist in the creation of the national agricultural data base. And, because additional assistance was needed in the rural economics/farming systems program in Jacmel, short-term money was used to employ a junior agricultural economist there. A total of 202 PM's of long term technical assistance was used.

The next page (Table 1) outlines long term technical assistance use during the life of the project, with a brief summary of actual scopes of work of team members.

2.2 Short Term Technical Assistance

The contract budgeted for 20 short term technical assistance personnel. Details are provided in Table 2 below. The program has used a total of 34.48 PM's of short term assistance which can be broken out in the following way:

Rural Economics and Statistics only:	5.45 PM
Rural Economics and Statiscics only (PASA):	6.5 PM
Farming Systems only:	16.5 PM
Rural Econ./Statistics & Farming Systems:	6.03 PM

Total Person Months: 34.48

2.3 In-country Haitian technical assistance

As the need arose during the life of the project, expatriate TA personel with their counterparts identified Haitian technicians, working for other organizations, who could assist the program at specific stages of its evolution. Some of these are listed in Appendix 1.

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TABLE I

ADS-II TECHNICAL ASSISTANCE STAFF
(January 1984 - January 1988)

ADS-II Contract between University of Arkansas and USAID signed on Jan. 20, 1984.
Project Termination Date: Jan.31, 1988

1/'84	1/'85	1/'86	1/'87	1/'88		PROJECT COMPONENT
XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	X	SWANSON (47 PersonMonths)	Rural Economics/Statistics (RES)
	XXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	X	BERTELSEN (32 PM)	RES
		XXXX	XXXXXXXXXXXX	X	BROWN (17 PM)	RES
XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXX		CHATTERJEE (45 PM)	Farming Systems Research (FSR)
XXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXX		PIERRE (46 PM)	FSR
		XXX	XXXXXXXXXXXX		GRAFTON (15 PM)	FSR

Total Long Term P.M. = 202

LONG TERM PROJECT PERSONNEL SCOPES OF WORK

RICHARD SWANSON: Economic Anthropologist
Filled Position of Agricultural Economist and Chief of Party. Duties included overall management, coordination, and implementation efforts of project as well TA leadership to rural economics and statistics components of project. This meant in practice involvement in both the national agricultural statistics and farming systems components of the project. Both national survey and GIS sub-components of project were initially implemented by TA leadership of both Swanson and Bertelsen below. Because it was impossible to fill all these duties completely out of Port-au-Prince, the program evolved into placing a junior ag.economist to be based in Les Caves for rural economics there, while rural economics in Jacmel and national statistics policy involvement, management continued out of Port-au-Prince. Eventually some assistance was obtained to more closely assist the rural economics in Jacmel as well.

MICHAEL BERTELSEN: Agricultural Economist
Filled position of statistician/computer programmer for rural economics and statistics component of program. Position was renamed as National Survey economist to reflect leadership role to be taken in implementing a national level recurrent agricultural survey. As part of creating a national agricultural statistics data base, TA personnel introduced CRIES/Geographic Information System to permit spatially referencing statistical data. As the GIS sub-component took form and expanded, additional TA assistance was required and authorized by USAID.

DOUG BROWN: Geographer and Information Systems Specialist, Programmer
Stepped into full time position expanding and training in use of the GIS within the rural economics and statistics component of project.

AMAL CHATTERJEE: Agronomist
Filled position of Farming Systems specialist, based in Les Caves. Specific skills included work with rice and sorghum.

JOSEPH N. PIERRE: Agronomist
Filled position of Farming systems specialist, based in Jacmel. Special skills included rural extension.

QUENTON GRAFTON: Agricultural Economist
Filled a newly created (in 1986) and authorized position as rural economist to be based in Les Caves to assist the Farming Systems Component of the project

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TABLE II:

UNIVERSITY OF ARKANSAS/WINROCK INTERNATIONAL
Long Term and Short Term Consultants to ADS-II Project # 521-0092

Name	Function	Project Component	Date Began	Date Completed	Person Months
ALBERT, Roland	Statistician, U.S. Department of Agriculture (USDA)	RES	03/02/85	22/02/85	0.75 *
			19/08/85	04/09/85	0.5 *
ASHLEY, Marshal	Math Statistician	RES	13/04/87	24/04/87	0.35
			01/06/87	11/6/87	0.35
BASTIEN, Arsene	Agronome, Amenagiste de Bassin Versant, Les Cayes	SP	1985, 1 jour par mois	01/07/86	
BATTAGLIA, Bob	Statistician, (USDA)	RES	10/03/86	24/03/86	0.5 *
			01/09/86	06/09/86	0.25 *
			01/12/87	08/12/87	0.25 *
BERNSTEN, Richard	Agricultural Economist Winrock International	RES/SP	(two visits 1985)		0.25
BERTELSEN, Cynthia	Nutritionist	SP	27/04/87	01/07/87	0.5
BLACKWOOD, Paul	Statistician (USDA)	RES	08/04/85	20/04/85	0.5 *
			17/06/85	30/06/85	0.5 *
			10/03/86	24/03/86	0.5 *
BROWN, Doug	Geographer, GIS	RES	15/04/86	18/04/86	0.2
BUCHER, Ron	Entomoligist,U.of Arkansas	SP	07/02/85	20/02/85	0.5
CHOPAK,Chuck	Ag.Economist, MSU	SP	13/03/86	29/03/86	0.5
			28/07/86	15/09/86	1.5
CLASSEN, John	Ag.Engineer.U.of Arkansas	SP	04/08/86	30/08/86	0.75
CUEVAS, Michael	Statistician, U.S. Census Bureau (BUCEN)	RES	14/01/85	01/02/85	0.5 *
DAVIES, Jim	Math Statistician, (USDA)	RES	17/06/85	30/06/85	0.5 *
DESTIN, M.	Ag. Engineer, FAMV,P-au-P.	SP	22/01/84	24/02/84	
HART, Bob	Agronomist, Winrock Inter.	RES/SP	(one visit 1984)		0.25
KNIPSCHEER, Henk	Agricultural Economist Winrock International	RES/SP	15/11/85	16/11/85	0.1
			31/10/85	05/11/85	0.25
			21/12/85	04/01/86	0.5
			18/05/87	22/05/87	0.18
LATHAM, Roger	Statistician, (USDA) Dir.of Ag.Programs	RES	14/07/86	27/07/86	0.5 *
LOUIS, Pierre-Antoine	Agronomist,Soil Consv.,FAMV	SP	15/07/85	17/07/85	
MATHIEWS, Vince	Math Statistician, (USDA)	RES	08/03/87	13/03/87	0.25 *

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MALCZYNSKI, Leonard	Ag.Economist,Computer Science	RES/SP	15/04/85	11/05/85	1
			31/10/85	05/11/85	0.25
			21/12/85	04/01/86	0.5
			15/03/86	24/03/86	0.5
			05/01/87	11/01/87	0.25
			15/03/87	23/03/87	0.5
			29/09/87	04/10/87	0.25
MEGILL, David	Math Statistician, (BUCEN)	RES	14/01/85	01/02/85	0.5 *
MEISCH, Max	Food Technology,U.of Arkansas	SP	17/08/85	24/08/85	0.25
NAVAL, Gerard	Agronomist, Extension, Cayes	SP	1985 (1 jour par mois)	01/07/86	
NEEDHAM, Scot	CRIES/Landsat, MSU	RES	14/09/86	24/09/86	0.5
NEELEY, Doug	Statistician	RES/SP	07/01/85	26/01/85	0.5
O'REILLY, Caroline	Agricultural Economist,Jacmel	SP	01/04/87	01/31/88	9
PIERRE, Yves-Francois	Sociologist, FAMV, P-au-P	SP	11/03/85	11/06/85	
ROPEL, Steve	Survey Statistician, (USDA)	RES	12/03/87	20/03/87	0.5 *
SCHULTINK, Ger	Economist, MSU/CRIES Project	RES	23/10/85	26/10/85	0.2
			15/04/86	18/04/86	0.2
			14/09/86	19/09/86	0.25
			09/03/87	15/03/87	0.25
SERAPHIN,Leonvil	Agro-Forestry, FAMV,P-au-P	SP	12/03/85	12/03/85	
TOUSSAINT, Andre	Statistician,Belgium	RES	15/05/85	18/05/85	0.15
			05/11/85	08/03/86	3
VERSEL, Malcolm	Ag.Economist, Comp.Specialist	RES/SP	12/05/86	24/05/86	0.5
VOTH, Don	Sociologist, U.of Arkansas	SP	22/07/86	09/08/86	0.5
		RES/SP	16/05/87	21/05/87	0.25
WALTERS, Ted	Ag. Economist, Les Cayes	SP	01/10/87	01/31/88	3
	TOTAL SHORT TERM EXPATRIATE T.A.:				34.48

University of Arkansas Official Visits

WESTING, Tom	Director, Internation Programs (were other unrecorded visits)	RES/SP	12/10/86	18/10/86	0.25
CHRISTMAS, Nancy	Project Director,U.of Arkansas	RES/SP	12/10/86	18/10/86	
			16/05/87	21/05/87	
LAFERNEY, Preston	Vice-Pres.of Ag.,U.of Arkansas	RES/SP	16/05/87	21/05/87	
FERRITOR, Daniel	Chancellor, U. of Arkansas	RES/SP	16/05/87	21/05/87	

Key to Codes:
- RES: Rural Economics and Statistics Component of Project
- SP: Farming Systems Component of project
- * PASA between USAID/Haiti and either USDA or BUCEN

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2.4 Haitian Personnel

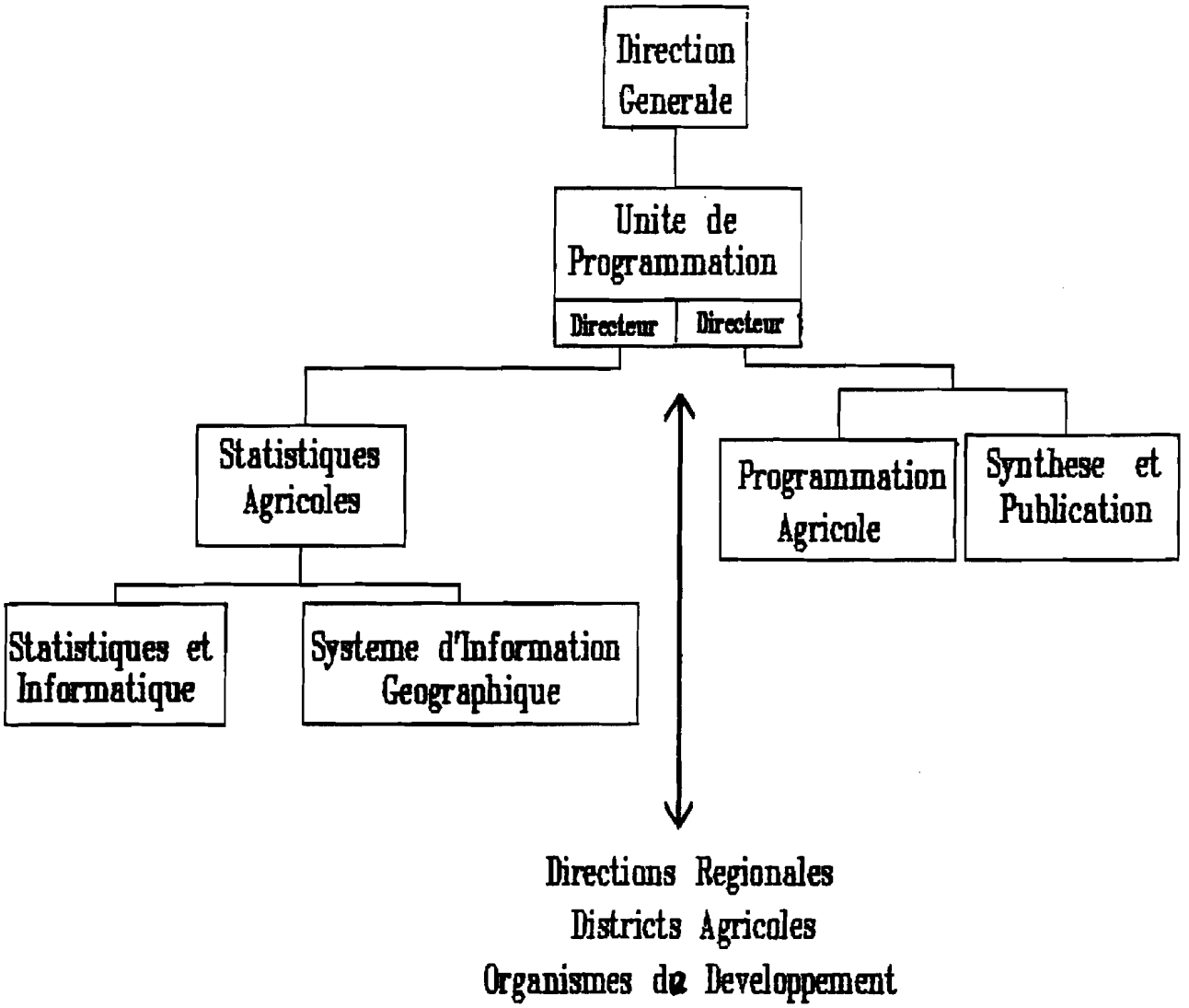
The project created within the ministry of Agriculture a number of divisions which either had never existed before (eg.GIS), or which had become disfunctional. As such, the project created a completely new organization, with its own hierarchy, within the Ministry. Most of the personnel were hired from outside the Ministry from the ranks of newly graduating young agronomists and statisticians. Many Haitian agronomists, statisticians, and others have passed through the various training programs of the project. Many of the best of these were retained by the project to fill its expanding role within the Ministry or sent overseas for long term training.

Current project personnel are listed in Appendix I, with the ADS-II administrative structure organigram as it existed for most of the project. During the last half of 1988, National Agricultural Survey and Geographic Information Systems divisions of the Rural Economics and Statistics component were formally transferred by Minister Menager to the Unite de Programmation. The organization for this change is given on the following page (Figure 2). The place of the Unite de Programmation within the overall Ministry of Agriculture can be seen in Appendix I.

The personnel for the Farming Systems component of the project are still led by the current ADS-II Project Director. A formal tie-in of this unit with Rural Development/CRDA and Extension are presently under study by Ministry personnel and a decision is expected long before the formal end of the ADS-II project in April, 1988.

Unlike the majority of MARNDR personnel, ADS-II employees work 25% longer days from 8:00 am to 4:00 pm.; occasionally even on Saturdays when field activities or data entry pressures require this. Personnel are as a result paid somewhat higher. The overall result, however, is that personnel are generally highly motivated and enthusiastic about the work they do and take pride in evident results.

Figure 2:


Direction Generale
Unite de Programmation
Directeur
Directeur
Statistiques Agricoles
Programmation Agricole
Synthese et Publication
Statistiques et Informatique
Systeme d'Information Geographique
Directions Regionales
Districts Agricoles
Organismes de Developpement

3.0 Farming Systems Program Component

3.1 Introduction

On-farm applied research undertaken in the Farming Systems Research and Extension (FSR/E) component of the Agricultural Development Support II project (ADS II) in Jacmel and Les Cayes, Haiti is summarized. A discussion of FSR/E crop trial, soil conservation/agro-forestry programs undertaken to date with a description of the goals of the socio-economic research program and studies implemented are included. Individual socio-economic interventions are discussed in detail showing the objectives of each study, the methodology adopted, and, when available, a summary of the results. Finally, recommendations for improving the research undertaken and general advice for improving future FSR/E socio-economic research programs in Haiti is given.

3.2 Overall Summary

In project document #23, a summary was given of major activites and base-line socio-economic data from the farming systems program and is presented below. Socio-economic data originated from initial reconnaissance and objective surveys at project sites in early 1984.

1. FARMING SYSTEMS PROGRAM LOCATION
   A. HAITI
   B. TWO DEPARTMENTS: SUD AND SUD-EST
   C. MOUNTAIN AND PLAIN SITES IN EACH DEPARTMENT

2. ENVIRONMENT
   A. 18 - 19 Latitude, 72 - 74 Longitude
   B. Jacmel Plain: 20-100 meters; Mountain: 100 - 600 meters
      Cayes Plain: 30-100 meters; Mountain: 100- 350 meters
   C. Temperature: Rarely exceeds a 10 degree change for any one day
      Daily min-max. = 24.4 - 37 C
   D. Precipitation: bimodal
      Jacmel Plain: 1200 mm.; Mountain: 2200 mm
      Irregularity of rainfall in Jacmel plain is a major constraint.
      Les Cayes Plain: 1985 mm.; Mountain: 1200 mm.
      Evapotranspiration: 98-118mm evapotranp.during Dec.-March, higher than rainfall received.
      Irrigation: Les Cayes plains: some 20,000 ha. potential; Jacmel plains: limited
   E. Soils:
      Jacmel Mountain: HAUT CAP ROUGE: Excellent conductibility, pH=8, generally high fertility
      Red and grey soil more fertile than black ones,
      Plateau region with 30-45 degree slopes
      Jacmel Plain: BAS CAP ROUGE: Soils with good conductibility, pH= 8, low potassium and phosphorus
      Soils considered fairly fertile

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Les Cayes Mountain: MANICHE/CAVAILLON WATERSHED: eroded slopes at 30-45 degrees, low fertility
Les Cayes Plain: BERAULT: Soils considered fairly fertile, PH=8, good conductibility

3. SOCIO-ECONOMIC INDICATORS
   A. Jacmel Plain mean size farm = 2.01 ha.
      Jacmel Mountain mean size farm = 1.39 ha.
      Les Cayes Berault Plain mean size farm = 1.49 ha.
      Les Cayes Maniche Mountain mean size farm = 1.53 ha.
   B. Land Tenure:
      Jacmel Mountain: % of land owned=59%; % sharecropped=5%; % rented=13; % undivided family=23%
      Jacmel Plain: % of land owned=56%; % sharecropped=24%; % rented=15%; undivided family=5%
      Cayes Mountain: % of land owned=52%; % sharecropped=30%; % rented=7%; % undivided family=11%
      Cayes Berault Plain: % of land owned=54%; % sharecropped=26%; % rented=5%; % undivided family=13%
   C. Languages: Creole, French
   D. Fertilizers available in intensive plain and mountain zones
   E. Formal agricultural credit extremely limited (18%-20%), informal credit costs 200%-350%/year

4. NATURE OF THE CROPPING SYSTEMS (Mountain, Plain)
   A. Largely subsistance farming; approximately 30% of produce sold in market
   B. Men most active in agriculture, women in commercialization of products
      Many households hire occasional labor during field preparation periods
   C. All labor done manually, animal traction rare (plots generally too small)
   D. Market Price of Corn = $.36/kg; Beans = $.90/kg; Yams = $.38/kg;
      Fertilizer costs: 20-10-20 = $.24/kg; 0-0-60 = $.28/kg; 11-53-00 = $.40/kg; urea = $.36/kg

5. FSR/E PROJECT ACTIVITIES
   A. Project works with corn, sorghum, rice, sweet potatoes, yams, manioc, red and black beans, pidgon pea, cowpeas, taro, coffee, leucaena, sesbania and other legume plants, napier and Guatamala grass, grafted citrus, assorted trees.
      Livestock worked with include swine, goats, rabbits
   B. Two agricultural periods; most important = Feb-July; second August-January
   C. Researcher Managed Trials (5-10 sites with two blocks and 3-5 treatments)
      Farmer Managed Trials (20-30 sites with one block and 2-3 treatments)

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D. Researcher managed trials are on a portion of farmer's field and are fairly small, organized/supervised by researcher.
   Farmer managed trials generally cover an entire farmer plot and are fairly large; are observed by researchers/ monitors.
   Two - three yield plots (3 meters X 3 meters) per large treatment, less when small.
E. Level of farmer involvement (see present case study); it is a continuum.
F. Most of above program executed in context of a watershed management system, including agro-forestry and soil conservation (rock terraces, vegetative barriers, etc).

3.3 ON-FARM TRIAL PROGRAM

The farming systems methodology used in the ADS-II project has been described in a number of its earlier publications, particularily in the original technical proposal (Document #1), through the 51 page reconaissance survey form (Document #2), Implementing a Farming Systems Research Program: A Case Study, (Document # 2), as well as in Documents 6 and 23. Beginning in the first weeks of March 1984, reconnaissance exploratory qualitative-type surveys were combined with site-specific focused objective quantitative surveys to set the overall context within which to establish priorities for the initial researcher managed trials. Researcher managed trials continued throughout the life of the project and represented the channel through which new ideas, activities, crops, etc. were first introduced to farmer's observations, environment, and socio-economic realities. Promising results from these trials flowed into farmer managed and demonstration trials which eventually led to either final acceptance or rejection of the innovation by the concerned farmers. Throughout the life of the project, focused, limited scope, socio-economic surveys with sub-samples of cooperating farmers were conducted to better understand farmer evaluations and specific costs and benefits of proposed innovations. These studies are reviewed briefly below.

Farming systems applied research, while accompanied with a methodolgy, is even more importantly seen as a philosophy of development in which farmers themselves must be involved as direct partners/colleagues in evaluation of supposed innovations coming from the research station. It has been the attempt to transfer this orientation towards research/development/extension which has been an overriding objective of technical assistance team members. It is also an orientation which generally is poorly understood or appreciated by most formal training programs in Haiti. We feel confident that the project has indeed been successful in transferring a greater appreciation for farmers and farmer reality to a number of agronomists and resident agronomists over the past four years. The potential for their being more effective agronomists in the future, wherever they work in Haiti, is considerable.

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3.4 RESULTS OF ON-FARM TRIAL PROGRAM

A partial summary of the results of the on-farm trial program is given here. The discussion comes basically from concluding remarks in a number of recent project publications and the annual reports. Reference to these documents for greater detail is encouraged. Comments will be organized on a crop-by-crop basis. Other results combined with a partial evaluation of the on-farm program are incorporated into the rural economics section below.

3.4.1 Maize

Maize is perhaps the single most important cereal crop grown in Haiti. It is produced in monoculture or in association with many other cultivated plant species, under a wide range of soil, climatic, and altitude conditions. Relatively cheap with regard to other food commodities, maize contributes significantly to sustaining the lives of hundreds of thousands of people in often very depressed areas of the country. As such, there is sufficient justification to seek means of increasing its production among those people for whom such increase would be most important: the small-scale farmer.

Many development professionals, both Haitian and expatriate, have planned and implemented large numbers of maize variety trials in the hope of finding a new, higher yielding maize variety to introduce into the Haitian peasant cropping system. With the possible exception of wealthy farmers, possessing large tracts of land, this would appear a difficult if not impossible feat to achieve under present socio-economic conditions of the vast majority of small farmers, with holding of less than 3-4 acres. Our experience has demonstrated that is unlikely that such farmers can produce and conserve seed from a cross-pollinating plant species such as maize. It is unrealistic to expect all small farmers of a given community to spontaneously reject at the same time their local heterogenous maize population (which they know will produce within some expected range) and adopt a new homogenous variety. It also difficult for the small farm early adopter of a new variety of maize to produce genuine seeds for a

new season since female flowers of the new variety will be pollinated by other local varieties in surrounding plots.

Some agronomists suggest that early adopters isolate their maize fields in time and/or space. Time isolation means planting before or after other farmers. This is not a risk small farmers can take, however. The project experimented with isolation in space during the second season of 1985 by grouping 18 farmers, putting four hectares in Haut Cap Rouge together to produce a La Maquina 7827 seed source for the zone. This variety had seemed superior to local varieties after three seasons of on-farm testing. Unfortunately, the variety had one weakness unforseen or experienced up to this time: the ear is not completely sealed by the spate. Rains continued beyond normal and the increased precipitations and humidity caused most of the Maquina to rot on the stalk. This did not happen to the local variety. Farmers in the zone, once favorable, quickly lost interest in the variety. While, interest is still evident in lower plain zones, the problem of obtaining quality seed from season to season still exists.

Furthermore, even had farmers obtained a good harvest, seed grain would almost certainly not have been stored until a new season by most farmers. Basically what is not consumed by the household will be sold to earn much needed cash funds. Obtaining the quantity of seed necessary to extend a variety in a zone, would be necessary to find some other means of multiplication. Some agronomists and farmers believe the Ministry of Agriculture should produce the needed improved seeds, but the Ministry historically has not been successful in such ventures. Others believe that commercial private firms can take over the responsibility of quality seed production. This may work for some types of farmers and for some crops (cf.Bruny rice farm). However, as in the case of fertilizers and pesticides, only farmers who can afford it might buy maize seeds from commercial firms -unless the price is kept the same as that of local market maize.

For the Haitian small farmer, however, the ADS-II believes there are more realistic ways of increasing maize production. Our experience has shown that the local varieties themselves hold considerable potential for increased productivity, particularily through on-farm seed selection, through alley cropping and soil conservation practices, appropriate amounts of fertilizers, timely dates of planting, and good plant population density. For example, in a period of only two years on highly eroded, but cultivated slopes in the Morija watershed of Haut Cap Rouge, Jacmel, we have observed farmers once again planting maize on slopes protected with rock terraces, even using fertilizer. Before the terraces, farmers had stopped growing maize and never used fertilizer. With the terraces, they have observed the accumulation of soil deltas behind terraces and that the slopes are protected from the ravages of quick run-off. Without the project's encouragement, farmers have begun to cultivate maize on such slopes. Far from wanting to discourage this, we believe this is a desirable development which will lead to greater care by farmers of their valuable land

resources from which they must depend on to survive.

Maize production could also be greatly increased in Haiti if land presently under cultivation of much less economical crops such as sugar cane, but controlled by wealthy landlords, could be used for maize or more productive crop. There are thousands of landless farmers throughout the country who could benefit from the employment opportunities such development could generate. For more information on the role of maize research in Haiti, see Project Document #36, How Can Small Farmers Increase Their Maize Yield in Haiti.

3.4.2 Sorghum

After a few years on intensive research on sorghum (cf.ADS-II Document # 50), the ADS-II project recommends that the variety M5009 be extended to all sorghum farmers. It has consistently out-yielded the local varieties and takes only three and one-half months to mature. It is a non-photoperiodic variety that can be planted in both seasons as a rainfed crop. It has good grain quality and color. The problem, however, is the shortage of seed. A seed farm modeled after the Amina seed farm in Bruny is perhaps the best solution. A number of other very promising varieties are currently being tested in Les Cayes.

Sorghum rows are recommended 75 cm. apart but many seeds should be planted and thinned to 2 good plants per hill after 10 days of seeding. Reseeding after 10 days is useless because the reseeded hills never catch up with the rest of the crop. The missing hills can be planted with thinned plants at the time of the first weeding. Row planting can making weeding easier.

3.4.3 Rice

Wetland Rice

Rice research carried out by the ADS II program since October 1984 ended with the establishment of a permanent seed multiplication farm in Bruny, that has, since April 1987, been operational. The objective is to produce 30 tons of Amina seed every season so that it can be distributed to other rice farmers in the plain of Cayes and elsewhere in Haiti. This seed will be available to all concerned at the current market price of paddy rice and can be purchased directly from the cooperative operated by the rice farmers of Bruny. For the seed distribution program to be successful, however, the seed has to be purchased "en masse" from the farmers at harvest time and then distributed to other interesetd households in some type of an extension effort. If such a system is not implemented, the farmers interest will be to sell their rice to vendors in the market, as is customary and hence it will be consumed rather than replanted.

There are a number of recommendations that ADS II field agronomists would make concerning this rice program. For more detail, refer to Project Document #50, Rice and Sorghum Applied Research.

1. Amina or any other HYV of rice introduced by the ADS II project should be cultivated with care. This includes keeping the seed from contamination with other varieties. In Bruny the quality control is assured by the presence of an agronomist but where farmers depend upon themselves, they must weed out off types before harvesting.

2. The field should be prepared and the grains from the previous crop (even if it is Amina) allowed to germinate. Then the field should be plowed again to destroy the seedlings thus making the field free of off types. This procedure should be repeated every season to assure that Amina remains pure.

3. Wherever possible, rice straw should be either burned and the ashes mixed with the soil or chopped and plowed in. In the first case it adds potash to the soil and in the second case it also increases the organic matter in the soil. Both are good practices.

4. Seedlings need to be raised with care. Leaving seedlings in the seedbed more than 21 days will drastically reduce yields so fields must be ready for transplanting on the 21st day after seeding rice in the seedbed.

5. A simple marker method to trace rows 20 cms apart is ideal to provide optimum density but it will require very good land preparation. Fields prepared with hand hoe have too many roots or other vegetative matters that impede the easy passage of a marker. One method is to fill up paddies with water for a prolonged period of time so that the organic matter decomposes thus making the field preparation easier. This ofcourse depends upon the availability of water that can not always be guaranteed.

6. ADS II recommends a very moderate dose of fertilizer; 90 kg of Nitrogen or 200 kgs of Urea/ha is recommended, although HYVs like Amina can take up to 160 kg of Nitrogen and still be profitable. For P2O5, ADS II recommends 60 kg/ha as a basal dose. This can be provided by superphosphate (46%) or many other complete fertilizers in the market that also contain Potash. One half of the nitrogen should be basally applied and the other half applied at the panicle initiation stage. For HYVs the panicles start at about 45 days after transplanting so a plant can be dissected at that time to see if the panicle has started developing.

7. It is important to maintain 2 to 5 cms of water standing in the paddies for the first thirty days (30) so that the maximum weed control is obtained.
Rice requires no weeding after thirty days because at that time the canopy closes making it difficult for the weeds to grow. The first weeding should be done 20 days after the field is transplanted. It is easier to do the weeding if the field is planted in rows. Random planting practiced by most Haitian farmers makes weeding a very difficult job.

8. Amina, TiRose, CIAT 31613, and CIAT 31616 are all good rice varieties and significantly outyield varities farmers are currently using. In our experience, however, Amina is the most preferred. Unfortunately, all of these varieties will become obsolete in 5 to 8 years time unless new research is initiated and these varieties replaced. Field station agricultural research is a dynamic process and every year improvements are being made over the older varieties. Therefore constant contact should be maintained by Haitian agronomists with the international centers of rice research to obtain from them the latest results. The international centers will be happy to send seed materials for testing at a nominal cost or often free.

9. A serious extension effort needs to be made to make Amina popular all over Haiti. On its own it will spread somewhat, but it will take time and the probability that the seed will become mixed with other varieties, if not selectively produced for some time, is high. The ministry of Agriculture should take a very active interest in promoting increased food production through this proven variety.

10. Rice threshers and blowers developed should be produced preferably by the farmers themselves in larger numbers so that those capable of affording them can obtain them. A low cost should be maintained so that potentially most rice farmers can make use of them. It would be ideal to set up an "Appropriate technology Center" in a place like Bruny where a modern workshop can be built with as little as $15,000. There, farmers can be trained to build simple tools like to blowers and the threshers.

UPLAND RICE

1. Although the research on upland rice is relatively new and the project has fewer data available, it would appear that a few upland varieties like IRAT 13 and IRAT 101 need special mention. IRAT 13 and 101 both have given yields of over 2.5 tons/ha which by upland standard is no small feat.

2. At least one more year of research and many field trials should be set up to test very thoroughly all the varieties to see which one merits going into pre-extension trials. If enough seeds become available at the end of the current year, IRAT 13 and 101 should go into pre-extension trials next season while still being included in a researcher managed trials for further verification. This gains time.

3. It is difficult to make recommendations for the fertilizer because upland rice totally depends on rains. However, if the soil moisture conditions are optimum, then within 15 days of seeding 40 kg Nitrogen should be applied as top dressing right after the first weeding. The second dose of 40 kg N /ha can be applied one month after the first application only if there is enough soil moisture. For P2O5 a dose of 60 kg/ha is recommended.This should

be
thoroughly mixed with Urea and applied within 15 days of seeding.

4. Only one weeding before the 30th day is required. Row seeding is the recommended practice.

5. Washing the seeds before seeding is a must. This practice removes the unfilled grains and gives better than 95% germination to the selected grains.

6. Rodent control is very necessary in both wetland as well as upland rice.

3.4.4 Black Beans

Bean legumes enjoy an important place in the cropping system of most Haitian farmers and beans hold a very significant role in meeting nutritional requirements of farm families. Project Document # 23, Black Bean on-Farm Research/Extension in Haiti, summarizes our experience with bean research. Most of our success has been with a black bean called Tamazulapa. In both the Jacmel and Les Cayes regions:

(1) Tamazulapa, under the same management as local black beans, gives a significantly better yield. It does no worse than local varieties under conditions of very low fertilitly, eroded slopes, and low irregular rainfall.
(2) Tamazulapa showed greater tolerance to moisture stress and to Golden Mosaique virus than the local variety.
(3) Without fertilizer, Tamazulapa performed better under irrigated conditions than under rainfed conditions. Fertilization did not seem to have a yield effect on either local or Tamazulapa beans.
(4) Tamazulapa, even though it matures some two weeks later than the local variety, is very much appreciated by farmers for both its vegetative growth and the food quality of its grain.
(5) Significantly higher yields can be expected when irrigation is used.
(6) The market value of the yield increases which can be expected from cultivating Tamazulapa (without fertilizer) on the land most small farmers already use for their local beans can contribute in important new source of revenue for these farmers. If, for example, only ôhalfô the land presently cultivated in black beans by farmers in the intensive plain and mountain zones of the Southern Department should, through extension efforts, shift to Tamazulapa, one might expect at least 1,152 additional metric tons of beans to be produced, representing a market value of about $ 1 million a year (* 26).
(7) The Tamazulapa variety will disappear in these regions without a determined effort on the part of extension agencies to make quality seed available to farmers at time of planting through local markets or agricultural input outlets (eg. wherever fertilizers, insecticides are sprayed).

Applied field research has confronted technicians with new issues for future research, both in the field and at the research station. We are still looking for better ways of helping more farmers realize the production potential possible with Tamazulapa for example. It seems likely that Tamazulapa will not prove of interest to farmers on extensively eroded slopes or very poor soils. We are concerned about how farmers can be assured a continuing source of quality seed, because over time it will become mixed with local varieties of the same color. Researchers have come to realize that local varieties themselves hold outstanding potential, particularily if selection of desirable characteristics is undertaken and field management conditions improve.

Increased production of one cultivar in the farming system, however important, is only a first step in improving the overall productivity of this system. We expect that there will be proven productivity increase for other cultivars through improved soil and ground moisture management on slopes (eg. vegetative barriers and/or rock terraces, mulching) as well as on the plains (irrigation, hilling). Such techniques for example might render Tamazulapa significantly better than local varieties in just those areas (eg. eroded slopes, low moisture) where it does not seem to outperform local varieties at present.

3.4.5 Cabbage

In a period of a little more than two years, initial experimentation with cabbage varieties on the Haut Cap Rouge plateau near Jacmel has been highly successful. Two varieties, KK-Cross and TropiKross, have effectively extended themselves to the point that at least 50% of the households currently cultivate some for their own consumption and for the local, regional and Port-au-Prince market. A market system has sprung up around the cabbage, with links within the plateau community and market people in Jacmel and the capital (cf. Project Document #48). The success realized with this vegetable crop is also creating opportunities for expanding into other crops such as irish potatoes, tomatoes, eggplant, etc.

Program personnel were beginning to explore ways of using the Geographic Information System to map out on a national basis all those areas of the country which could potentially also respond favorably to extension of these and other positive project outputs. This would have been done by searching for areas with similar soil, elevation, and rainfall characteristics in common. Distance from population centers and access to road for transporting inputs in and products out would also have been a factor of importance.

3.4.6 Other Crops

Substantial work has been done be the project with other crop cultivars, including pearl millet, sweet potatoes, pigeon pea, yams, plantain, cowpeas, climbing beans, and tomatoes. While we

have begun to experience some positive results for cowpeas, and sweet pototoes in particular, the results are tentative and need much more on-farm research to justify any real extension type activity. Obtaining enough vegetative material for our pre-extension activities has always been a problem. This has been delt with in trying to produce our own, but this takes much time. Obtaining enough bitter manioc cuttings (a 10 month crop) for a research managed trial when we only have begun with enough for one plot can take two years, for examply. Results are documented in the 1986 annual report.

3.5 Rural Economics Program

The FSR/E component of ADS II Project in Les Cayes and Jacmel began with a rapid reconnaisance survey of prospective intervention sites in the Les Cayes plain and Maniche area, and in Haut Cap Rouge and Bas Cap Rouge in Jacmel in the early part of 1984 (see ADS II Report Number 6). This base survey helped identify the most important cropping and livestock systems and production constraints, the intervention sites in which the project could best operate, and provided insights into the research strategies to be followed.

Field research began with farmer managed trials in the fields of cooperating households. The establishment and maintenance of these trials was undertaken by locally hired farmers, called "moniteurs", under the supervision of the technical assistance team and Haitian agronomists attached to the project. The major innovations reviewed included the testing and introduction of improved varieties of rice, sorghum, beans, maize and tubers, and the development of alternative management techniques with respect to animal husbandry, soil conservation practices, and the planting, harvesting, and threshing of the major crops found in the region. From researcher managed trials the project quickly progressed to the use of farmer managed trials in order to better assess the value and applicability of the innovations being tested. The culmination of this work has been the identification of higher yielding varieties of rice, sorghum, maize, and black beans, labor saving techniques for harvesting and threshing rice, and the development of effective soil conservation strategies. In addition, the project has been involved in the reintroduction of pig raising into its intervention sites and has developed and encouraged the raising of rabbits.

During the first two years of the program, the rural economics program was limited to, after the initial reconnaissance and quantitative surveys, a number of focused surveys on pig raising, acceptability of specific introduced tree seedlings, to setting up a marketing survey and rainfall data collection routine, and to partial economic analysis of field trial data pointing to significant agronomic differences of new varieties or techniques. Implementation of the program in Jacmel and Les Cayes proved

difficult with the principal technical assistance person (Swanson) based in Port-au-Prince with responsibilities of chief-of-party and to coordinating other rural economics and statistics activities. Identification of a TA statistician proved difficult and delays were encountered in final acceptance of a number of candidates. There was also a conflict of interest in project configuration whereby the rural economics/statistics component was to be responsible for farming systems rural economics while at the same time initiating a wider department level agricultural statistics survey. By 1985 it was not clear where the priorities of trained rural economics personnel should be placed: to rural economics with the farming systems program or Department du Sud level statistics. The latter generally was chosen to the neglect or loss of timely data collection by pre-committed enumerators. The team was able to communicate its concern about these problems to an evaluation team (Locher et.al, 1986) which lead to recommendations for modification. Many of these were accepted.

The socio-economic research program began in earnest with the arrival of additional technical assistance support in late July, 1986 (Chopak) and in October, 1986 (Grafton). At this time, Grafton was able to coordinate activities in distant Les Cayes with Swanson concentrating in Jacmel. The Jacmel program was further strengthed in April 1987 with the arrival of Ms. O'Reilly.

The major objectives of the rural economics program was to monitor and analyze each aspect of project intervention and to implement studies that would identify the major constraints in the household farming system. Research was directed to addressing the relationships between the economy and social structure of the household to its cropping and livestock systems. The overall aim was to improve the innovations developed and to suggest new strategies and interventions for overcoming constraints facing farming households. An important focus of the program was also to ensure sufficient counterpart training to enable the work to continue after the departure of technical assistance support.

Major studies implemented include the following:

- An on-going survey of the labor and agricultutal activities of some 40 households (10-12 per sub-zone) at Jacmel and Les Cayes;

- An appraisal of the rates of adoption and reasons why households have or have not adopted FSR/E innovations (Jacmel and Les Cayes, ADS II Reports # 20 and 43);

- An assessment of the soil conservation practices of the ADS II project in Jacmel and Les Cayes (ADS II Report # 44 and 49);

- An analysis of the economic benefits of introduced techniques for harvesting and threshing rice (Les Cayes) (ADS II Report # 42);

- A study of the costs of hired labor for the major agricultural activities and crops (Les Cayes) (ADS II Report # 40).

- An evaluation of the effectiveness of the project's pig reintroduction program and comparisons of intensive and extensive management systems (Les Cayes and Jacmel) (ADS II Report # 32 and 54);

- An assessment of the ADS II rabbit raising program (Les Cayes) (ADS II Report # 51.)

- The development of a weekly price series for the major crops marketed (Les Cayes and Jacmel);

In addition, training was given to Haitian counterpart agronomists attached to the project (agronomes, resident agronomes, student trainees) in the use of microcomputers and statistical software for the analysis of agronomic trials and socio-economic studies. This was accomplished both through bringing in short-term consultants to lead short courses (Neeley and Malczynski) as well training by resident TA staff (Grafton,Swanson). Most recently, to accomplish this effort, project agronomists were given a theoretical course, complete with prepared lecture notes, on the analysis and interpretation of agronomic trials and on agricultural experimental design (cf. ADS II Report # 46).

A summary of results of the studies implemented by the research team are presented separately below under their individual titles.

3.5.1 Study on the System of Production of Households

Objectives
To appreciate the constraints that households face in their farming system, one needs an understanding of their social and economic environment. This, however, can only be obtained with a good working relationship between the household and researcher and regular monitoring of household activities.

To obtain a better understanding regarding the constraints on farm households with respect to labor, land and capital availability, and become more aware of household use of inputs, level of production and the costs and returns of farming operations, the ADS II project instituted a weekly monitoring of some 20 households in its four sites of intervention. It was hoped that the data from this study would provide budget data for the major crops grown in Jacmel and Les Cayes regions in both the mountain and plains, household cropping calendars, estimates of household income, expenditures and assets, and data on the allocation of household labor throughout the year. This information could then be used to better evaluate the interventions implemented and suggest ways to overcome constraints in the households' farming system.

Methodology

A census of the project's four sites of intervention was undertaken in the second season 1986. From this list, some 40 households were chosen to be included in a weekly monitoring of household activities. The criteria for selecting households for the study were their location, i.e., 10 households each from irrigated plain, non-irrigated plain and mountain sites, the type of land tenure held, and the average size of land-holdings. The objective was to ensure as broad a selection of households as possible were included in the analysis.

The questionnaire for the study asked questions on inventory of livestock and land-holdings, household labor, revenue, expenditures and use of farm inputs. Prior to implementation, the questionnaire was extensively tested in the field from October-December 1986. Following revisions, the regular monitoring of the households began in January 1987.

The study allocated an average of two households to each agronome at Les Cayes. In Jacmel, experienced enumerators covered 12 out of 22 households, the rest being divided between resident agronomists. Use of the young agronomists was desired in order to force them into having daily and regular contact with a group of farmers. Each household was to be visited on a pre-selected day each week to find out what activities and changes in inventories had taken place of the previous seven days. This information was then noted on the questionnaire and approximately every two months the completed questionnaires were collected in Les Cayes and Jacmel for data entry. An agronomist in the socio-economic research team regularly checked and verified the data in the field. Following arrival at the office and checking for inconsistencies and errors, the data was then entered, in Les Cayes, in a worksheet format on the software package "LOTUS 123". Jacmel used Statpac software for input and analysis.

Summary of Results

Since the study covers a 12 month period from January 1987 - January 1988, final results will not be available until the early part of 1988. It should be noted, however, that without technical assistance support until the end of April 1988, many of the results of the study will not be documented since Haitian counterparts are not yet sufficiently trained to fully analyze the data. The most experienced Haitian analyst has no more than a Faculty of Agriculture (FAMV) BS. degree; at least a MS level technician is necessary to adequately understand the methodology and technical issues involved. To the extent possible, therefore, cost of production and budget data for the first season 1987 should be completed before the end of 1987, and will be summarized in Reports # 52 and 53.

3.5.2 Study on the Adoption of ADS II Farming System Innovations

Objectives

The ADS II project has gathered a considerable amount of information on the value of its introduced technologies. This was supplied from several seasons worth of data from researcher and farmer managed trials, opinions of farmers involved in the trials, and valuable feed-back from participants in the project's field days. Using these sources, it has been concluded that a number of interventions are ready to be incorporated into a formal extension program. By 1987, the ADS II project considered it appropriate to undertake a comprehensive study on adoption rates and the reasons why farmers were or were not adopting introduced technologies. A similar study in early 1986 (ADS-II Report # 20) proved too early and inconclusive as research results were only just beginning to be more widely applied with farmer managed trials. Such information, nevertheless, is essential if any kind of formal extension effort is to be contemplated.

To this end, a formal survey was initiated to evaluate the rates of adoption and reasons households have for adopting and for not adopting the project's innovations in its sites of intervention. This study was designed to fulfill two objectives; first, to give a better understanding of the successes and failures of the interventions under review, and second, to build upon this knowledge to develop a more effective extension program. Specifically, the study shows, among other things, the interventions which warrant the greatest effort in extension, the misconceptions, concerns and perceived benefits that farmers have to specific innovations, and their potential for adoption.

Methodology

The sample for the study was randomly selected from a list of households prepared from a 1986 census of the project's four sites of intervention. In the sample procedure each household, regardless of location, had an equal chance of being selected to be interviewed (see Table 3.).

At Les Cayes the intention was to interview 200 households, or about a third of the total population. The high sample number was considered appropriate since it was felt there would be considerable variability among households on their perceptions of the introduced technologies. Further, for certain innovations, it was thought there would only be a small proportion of households who were adoptors and hence a smaller sample number would not give a sufficient number of responses to adequately evaluate the technologies.

Table 3: Households Surveyed for the Les Cayes ADS II Adoption of Innovations Study

Location	Topography	# Sample H/holds	Total # H/holds
Charlette/LaForce	Plain	71	222
Jogue/Durocher	Plain	32	132
Macieu/Boudet	Plain	57	156
Fond-des-Freres	Mountain	24	93
		---	---
		184	603

Ultimately, only 185 households were surveyed since a certain number of households could not be located and interviewed in the alloted time for the field work. It is appreciated that this could lead to some bias in the results although alternative households, themselves randomly selected from the population lists, were interviewed, wherever possible, to make up the desired numbers. One of the survey questionnaires was eliminated from the analysis as it was improperly completed.

The interviews took place between April and June of 1987. The questionnaire used was written in Creole and was divided into seven major sub-sections. The first section provided an overview of the respondents' awareness of the project and its major innovations. The remaining six sections were grouped under the major headings of rice, maize, sorghum, beans, livestock, and soil conservation and were asked only when relevant to the particular household being interviewed. Hence, if a household did not grow paddy rice, as was the case for all households at Fond-des-Freres, questions pertaining to introduced rice technologies were not asked of the respondents.

Summary of the Results

The study examined the rates of adoption by households and their reasons for and for not adopting farming systems innovations introduced by the ADS II project in its four major sites of intervention.

A high degree of recognition of the project existed, with 75% of all respondents reporting they were aware of at least one its activities. The vast majority of households were aware of the project through interaction with project personnel.

Recognition rates among households for cropping practices introduced by ADS II were 60%, 64%, 67% and 69% respectively for black beans, rice, sorghum and maize. The highest participation rate as a proportion of all households was for sorghum at 21% with the lowest for black beans at 11% of all respondents.

Among all ADS II innovations, as a proportion of the relevant

number of households affected by the interventions, soil conservation measures had the highest participation rate at 58%. The lowest participation rate was recorded for the ADS II goat breeding program.

Of households surveyed growing rice in the past season, 19% planted ADS II varieties. In area, the introduced varieties accounted for 12% of the land in rice production. The most widely grown variety was CIAT 16, originating from CIAT, Colombia, and planted by 12% of rice growing households. The most preferred variety was Amina (IR-5931-113-1), a rice developed by IRRI and liked very much by 75% of respondents growing ADS II rice varieties. Amina's popularity was based on its high yields. Some 58% of rice growing households were aware of the ADS II portable rice thresher and 23% were adopters.

Around 31% of maize growing households planted ADS II varieties. In area, the introduced varieties represented 16% of the total land cultivated in maize. The most widely grown ADS II variety was selected Chicken Corn, grown by 24% of households planting maize. The variety, La Maquina, was grown by 6% of respondents cultivating maize. The best liked variety was selected Chicken Corn, liked very much by 73% of respondents. Its popularity was based on its faster maturation and higher yields than other varieties. Some 30% of households were aware of the ADS II recommended practices for plant spacing for maize and 28% were actually practicing the recommndations. A similar proportion adopted the project's advice of keeping only two maize plants per mound.

Almost half (47%) of sorghum growing households planted ADS II varieties. In area, these varieties accounted for 14% of the land in sorghum. The most popular and widely grown variety introduced by the project was M 5009. This variety was liked very much by 72% of respondents. Its popularity was due to its higher yields, felt to be important by 95% of all respondents liking it. Some 22% of respondents were aware of ADS II plant spacing practices and 17% of sorghum growing households were following recommendations. Around 22% of respondents growing sorghum adopted the recommended practice of retaining two plants per mound.

In the past season, 49% of households that planted black beans grew Tamazulapa, a variety popularized by ADS II. In total area, this variety accounted for 38% of the respondents' land cultivated in black beans. Tamazulapa was favored because of its higher yields and drought resistance, considered important respectively by 67% and 59% of respondents.

Some 26% of households surveyed were members of pig cooperatives, of which 96% had received pigs through the ADS II distribution program. The main contribution of members to their cooperatives were money, labor and materials given respectively by 79%, 71% and 63% of respondents.

Around 17% of all respondents raised rabbits of which 23% had obtained their animals through the ADS II rabbit program. Respectively, some 57% and 60% of households expressed a desire to raise rabbits as a source of meat and as a source of revenue. Some 5% of all respondents did not want to keep rabbits because they were unaccustomed to raising the animals. Of those households wanting to raise rabbits, 41% expressed a desire to build a hutch similar to that introduced by the ADS II project.

Only one household out of 34% of all respondents raising goats had used the services of the introduced Alpine-Nubian buck. This small percentage is due no doubt to the late arrival of the buck at the project's intervention sites. Some 97% of goat raising households expressed a desire to mate their female goats with the hybrid buck.

In the hill-side site of Fond-des-Frères, 64% of households had erected some soil conservation measures. In total area, the land conserved was some 28% of respondents' land. A high awareness of the benefits of soil conservation existed among households in the area, with 100% of respondents performing conservation because it preserves the soil and gives better crop yields. The contribution given by ADS II to households to partially cover their labor costs was considered important by 95% of respondents. Of all conservation measures, respondents were most aware of tree planting, the use of living terraces and the planting of perennial grasses.

3.5.3 An Assessment of the ADS II Soil Conservation Practices at Fond-des-Frères, Les Cayes region and Haut Cap Rouge, Jacmel region

Objectives

A major objective of the ADS II project has been to develop successful conservation strategies that can be adopted by hill-side farming households. This study describes the approach taken by the project and assesses its effectiveness by documenting household awareness, attitudes, and rates of adoption of ADS II conservation practices; the importance of land tenure in affecting adoption of conservation measures; and presents the costs to the project and farmers from such efforts. By documenting the project's strategies, with its successes and failures, it is hoped other organizations undertaking soil conservation work in Haiti can benefit from the ADS II Fond-des-Frères and Haut Cap Rouge experiences.

Methodology

Information here comes from several sources; first, a survey of adoption of the ADS II FSR/E innovations completed in June of 1987 (in Les Cayes); second, a cost and labor study of the soil conservation efforts completed by households in 1986 and 1987; thirdly a survey of selected farmers in Jacmel about their evaluation of the soil conservation program. The Jacmel program

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has been in progess for somewhat longer than that in Les Cayes.

The ADS II adoption survey (see ADS II Report Number 43) was undertaken to provide a terminal evaluation of the project and assess the rates of adoption and reasons why households have or have not adopted the introduced innovations. The sample for the survey in Les Cayes was randomly selected from the some 600 households found in the project's four sub-zones of intervention. At Fond-des-Frères, 24 of its 93 households were interviewed regarding various cropping and livestock practices as well as soil conservation measures. The data from this survey formed the basis of the results which present the awareness, attitudes, and reasons why households have undertaken soil conservation practices.

From the beginning of soil conservation activities in both Jacmel and Les Cayes, questionnaires were completed for each plot of land where conservation measures were implemented. The questionnaires were written and completed in Creole and obtained information on the type of conservation practices undertaken, amount and cost of labor used, quantity of napier grass planted, amount leucaena and trees planted, and the number, length and area encompassed by the constructed terraces, and finally the amount in gourdes the farmer participant was given as the project's contribution to these activities. The data from these forms provided the details on the costs and materials used in the conservation measures.

Summary of the Results

A. Haut Cap Rouge, Jacmel region

Haiti is littered with the relics of past soil conservation projects. In most of these, well-intentioned donors wanted to do something quickly. Haiti, it was reasoned, doesn't have time to lose, it is losing its precious mountain soil resources, irrigation canals and dams in the plains are silting up, work needs to be done immediately. Food-for-work or direct payment of laborers in the region (at minimum wage of about 16 gourdes/day) were often chosen as the quickest way to get at the problem. Besides, it was thought, this will bring employment to the rural areas where it is most needed.

ADS-II, from the beginning, has believed that while the basic problems listed above exist and are serious, the methods often used have created far more problems than they have solved. Dependency relationships have been created everywhere in the Haitian countryside through such handouts. No-one wants to pick up a shovel without being paid for it - even when it is on his or her own land. Work is done (trees planted, terraces or ditches created or dug) but not maintained, usually because the farmer exploiting the land may not himself have even been involved in the work or understood the reason or need for it. A year or two later nothing is left, or worse, gulley erosion has been created where it may not have existed before by unmaintained or poorly constructed

contour ditches.

It was clear to us that a systems approach was required to watershed management, that physical improvement of the land through rock terraces or vegetative barriers was only a component in the overall picture of what the farmer had to do with this land to survive. A basic principal of departure was that Haitian farmers cultivate their hillsides, sometimes very steep ones, because they have to; that such farmers for the forseeable future will need to continue to do so. Our challenge was how to do this while not only protecting what was left of the land resource, but also to increase in a sustainable fashion the very productivity of this land to meet increasing demands that farmers are going to have on it. Nor was it evident to us from visiting many soil conservation project sites in Haiti that anyone had come up with a proven, sustainable system that worked with small farmers. As with any other activity in our applied research program, we approached watershed development (which to us included soil/water conservation, agro-forestry, animal and crop management) as a trial. Through trial and error, we expected to develop appropriate results for the target areas. Unfortunately, most activities of this type are far longer in scope than the planned life of our project.

ADS-II purposely did not lift a single rock for rock terraces or dig a single contour ditch in Jacmel or Les Cayes for the first year and a half. We believed it essential to first obtain the confidence of the area farmers through our on-farm crop and livestock testing program, to attempt to understand what farmer constraints and goals were, how they organized themselves to get things done. We wanted to know what kind of vegetative resources (trees,grasses) would perform well at the different altitudes we were working at (300-350 meters at Fonds-des-Frères, 600-800 meters at Haut Cap Rouge) and which the farmers would appreciate. In 1984, for example, a trial was set out in Haut Cap Rouge (Experiment #9, page 147,Document # 7) in which four types of trees were introduced, distributed to a sample of 67 farmers, and monitored over a period of a year for % mortality, farmer perference, etc.

During the fall of 1985 we believed we were prepared to become involved as a project in physically dealing with a number of watershed sub-systems. Actual work began in September.

As a project we decided not to use food-for-work incentives and not to pay farmers to improve their land. But we also believed that it was essential that there be some type of program contribution to the activities performed to at least cover part of the cost of the noon lunch/drinks most Haitian traditional working groups expect from their hosts. We also believed that, because water/soil conservation work of this kind benefited not only the particular farmer's plot, but in a larger sense, the entire lower watershed region (increased water infiltration resulting in increased and more steady spring flow for domestic consumption and

irrigation needs for example), it was also just that outside sources assist in a financial way through a cash contribution. It was important to us that the amount received be clearly seen as a contribution and not payment for services rendered. Also vegetative materials would be provided at no charge and tools loaned for special activities. A farmer/monitor would be in charge of recording work performed and assisting in marking out the contour with a simple A-frame. Numerous group animation meetings were held in both Haut Cap Rouge and Fonds-des-Freres during the first two years to attempt to encourage farmers to organize to protect their slope fields and plant tree and grass strips.

Farmers and agronomists agreed together in 1985 to work as groups in selected watersheds and that the project contribution would be given before each day's activities so that food/drink could be prepared by the field host to the working group. Some 10 hectares were conserved in this manner. However, in both regions this approach was quickly seen as unworkable. It was the farmers themselves in Jacmel who came to the program agronomists and stated that their idea of groups wasn't so good after all. The problem was that a working group of 20 might be scheduled to work on Wednesday. On Monday or Tuesday the group leader would receive the contribution (4 gourdes/person X 20) towards the days lunch. Then only 14 might show up, or all would show up but stay for different lengths of time. What did the leader do with the money for the 6 who didn't show? Did the person who dropped in deserve equal access to the "lunch"? Jacmel farmers suggested working on a farmer by farmer basis. Let the farmer come to the agronomist and ask for assistance in marking contours and obtaining the vegetative material needed; permit the farmer to do the work himself or with his family or anyone else he might wish to call together to assist him (his working group). When the work had been completed give the farmer the contribution we could give. It was clear that without the contribution, however, few farmers wanted to perform these activities.

During the group activity stage, our daily plot records showed that the 3.5 gourde/person contribution when divided by the work accomplished (about 3.5 linear meters of rock terraces) in a working day (est. 8:00 am. to 1:00 pm.) came to one gourde per linear meter of rock terrace ($ 0.20/meter). We decided to accept the Jacmel farmer's suggestion and measure the rock terraces after satisfactory completion of work and give a contribution of $0.24/meter. Calculations were made this way to simplify for project monitors and were randomly checked by agronomists for accuracy:

150 linear meters were completed properly and measured in farmer Pierre's field. This is divided by 3.5 (estimated # of meters that should be completed in a work day = 42.86 "work days". This is multiplied by 3 gourdes ($0.60)/"work day" contribution. Farmer receives 128 gourdes ($25.71). The actual work could have been done by the farmer during two months or in four days with 10 men. The contribution amounts to

approximately $ 0.14/hour of actual - hardly to be considered a salary by anyone's standards. Of course, the farmer does benefit from tree seedlings and grasses as well.

Vegetative material (napier, guatamala grass, leucaena, tree seedlings: Haitian oak and mahagony, bois blanc and bois pele, plantain, avocado, coffee seedlings) were provided at no cost. Planting was done by concerned farmers and monitors. On-farm researcher and farmer managed trials would concentrate on land improved in this way by farmers.

A French FAC project in a nearby region had also been attempting to encourage soil conservation practices. However, they did not give any type of financial contribution to the farmers at all, only the vegetative materials needed along with technical guidance. While this approach appears attractive, the fact observed was that there was not much taking place either. Some farmers were persuaded to do the necessary work but those doing so were few and often physically separated by some distance. Unprotected land above could still bring to nothing the best intentions of farmers below. We have rejected this as a viable approach principally because, while one should not rush into a soil conservation program without complete farmer involvement, one also can not wait for years and years for such work to take place. Time is a factor too.

The results of the new approach in Jacmel were dramatic. Not only was demand enormous for monitors to mark contours, but the rock terraces constructed were superior (higher and wider) than those done earlier through group activity. We were so encouraged by the results that in 1986 the program was greatly expanded to other sub-watershed systems in Haut Cap Rouge - with major emphasis on the Corail/Morija sub-watershed system. By 1987 it was also evident that many farmers were doing the work on their own, being impatient for a monitor to show up at their field (which somethimes wasn't in an area we had determined as our "project zone". Haut Cap Rouge, from the air today, is covered with terraces. In 1984 one could not have found a terrace anywhere in the area. Because of the lack of vegetative materials, only about a quarter of this has been further 'completed' with tree seedlings and grasses.

In Fonds-des-Frères, Les Cayes, the group approach had run into similar problems and work temporarily suspended at end of 1985. In project meetings we decided to export the Jacmel methodology to Les Cayes. This was implemented in late 1986 and has been considered to be equally successful (see below).

A socio-economic monitoring program was set up in Morija with the Geographic Information System. Using aerial color prints at 3,500 feet, and moisaiqued together, the watershed was digitized at a 1 meter X 1 meter resolution. Individual plot boundaries were outlined and ownerships noted (owned, share-cropped, rented,

etc.). Superimposed on this we mapped the changing crops and associations from season to season, the rock terraces were digitized, as were the paths, location of household residences. With this data, we are in a position to fairly simply, using new photography superimposed upon physical data, to monitor the change taking place in the watershed. We expect to see more corn and fruit trees (coffee, plantain, avocado) develop as the soils are retained behind rock structures (this is already happening). We expect to be able to monitor the spread of leguminous leucaena and other planted trees develop in the watershed as they become old enough to appear on photography. We are also able to monitor the yields/hectare of selected areas (top of slopes, slopes, slope valleys) across time. Interviews in the lower valley of Cyvadier with the men involved in coordinating use of spring water for irrigation (no regular cement structures yet exist) already reveal increased volume of water in springs, and longer flowing springs.

The ADS-II project has developed a methodology in Jacmel which could be applied elsewhere in Haiti, as it has been in Fonds-des-Frères. We believe the physical setting determines the type of structures needed and that in the case of Haut Cap Rouge, rock terraces supported by vegetative material, were and are the only way to proceed (where rock piles already litter/cover field surfaces). In Les Cayes a different type of structure was necessary (vegetative barriers with shallow contour canals). The Tables and Figures below are provided to illustrate the type of data recorded in the Jacmal Haut Cap Rouge Morija soil/water/agro-forestry watershed program. For more detail, reference should be made to the 1986 (Document # 39, pp.34-39; 112-122, and Document #49 specifically summarizing project experience with watershed management in Haut Cap Rouge).

Table 4: TOTAL VALUES PER ZONE - DRY WALL CONSTRUCTION
Haut Cap Rouge (Jan.- Aug. 1987)

ZONE	Number of plots	Area (cx)	Area (ha)	Duration of work[1]	# of days worked by[2] men	# of days worked by[2] women	Total days worked	Metres dry wall	Contribution[3] (gdes)	Contribution[3] ($)
Corail	419	120.33	155.23	2295	8178	2134	10312	52187	46968.30	9393.66
Christ	36	8.5	10.97	173	572	97	669	4153	3737.70	747.54
Troudo	19	3.42	4.41	105	247	53	300	1870	1683.00	336.60
Mayette	7	2.29	2.95	36	156	33	189	811	729.90	145.98
Francique	39	11.65	15.03	177	903	158	1061	4484	4035.60	807.12
Brice	13	1.63	2.10	63	139	26	165	1059	952.20	190.44
Delmas	3	1.05	1.35	13	59	10	69	299	269.10	53.82
All zones	536	148.87	192.04	2862	9605	2511	12762	64862	58375.80	11675.16

Table 5: DRY WALL CONSTRUCTION IN HAUT CAP ROUGE (Jan.- Aug. 1987)
Average values per plot, by zone

ZONE	Avg. area of plot (cx)	Avg. area of plot (ha)	Duration of work (days)[1]	# of days worked by[2] men	# of days worked by[2] women	Total days worked	Metres dry wall	Metres per day	Contribution[3] (gdes)	Contribution[3] ($)
Corail	0.30	0.38	5.48	19.52	5.09	24.61	124.55	5.06	112.10	22.42
Christ	0.24	0.31	4.81	15.89	2.69	18.58	115.36	6.21	103.83	20.77
Troudo	0.18	0.23	5.53	13.00	2.79	15.79	98.42	6.23	88.58	17.72
Mayette	0.33	0.42	5.14	22.29	4.71	27.00	115.86	4.29	104.27	20.85
Francique	0.30	0.39	4.54	22.15	4.05	27.21	114.97	4.23	103.48	20.70
Brice	0.16	0.20	4.85	10.69	2.00	12.69	81.53	6.41	73.38	14.68
Delmas	0.35	0.45	4.33	19.67	3.33	23.00	99.67	4.33	89.70	17.94
All zones	0.28	0.36	5.34	17.92	4.68	23.81	121.01	5.08	108.91	21.78

1. Number of days over which work was performed
2. # of men/women working x # of days
3. Contribution calculated at 0.90 gourdes per day

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Fig. 3: **Contribution per household**

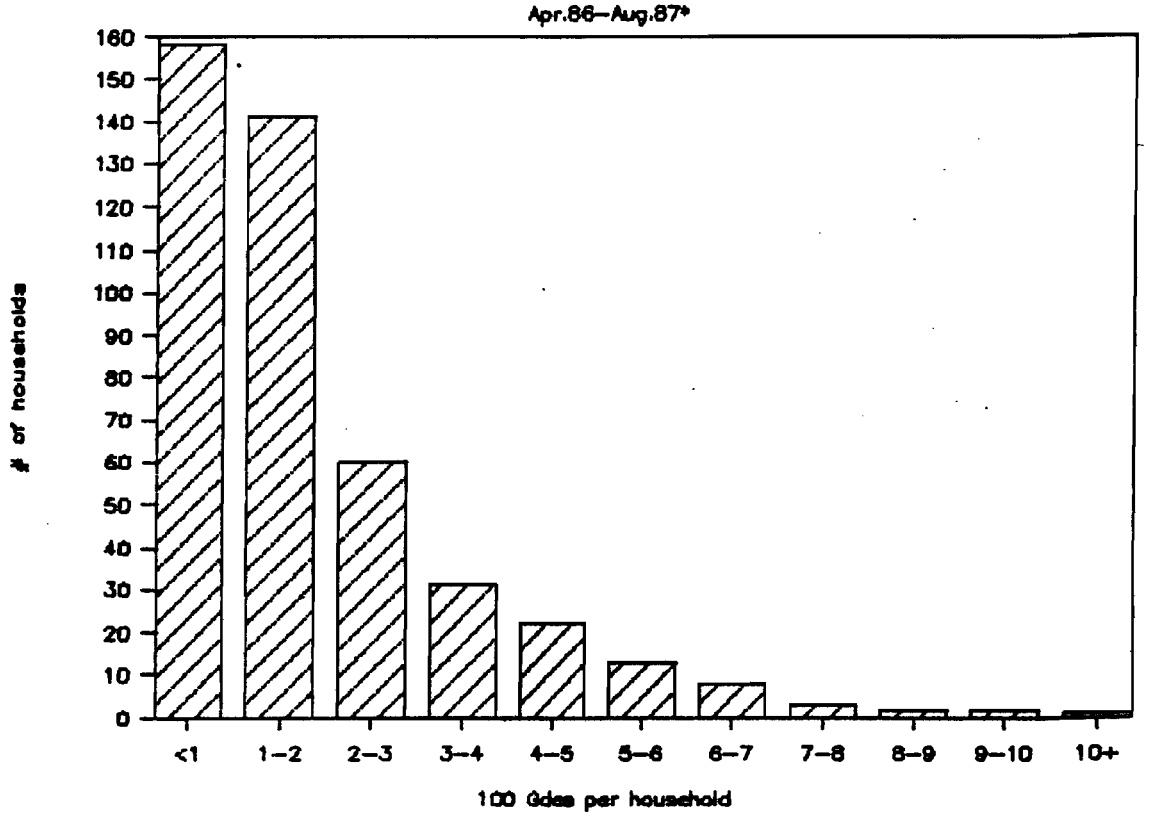
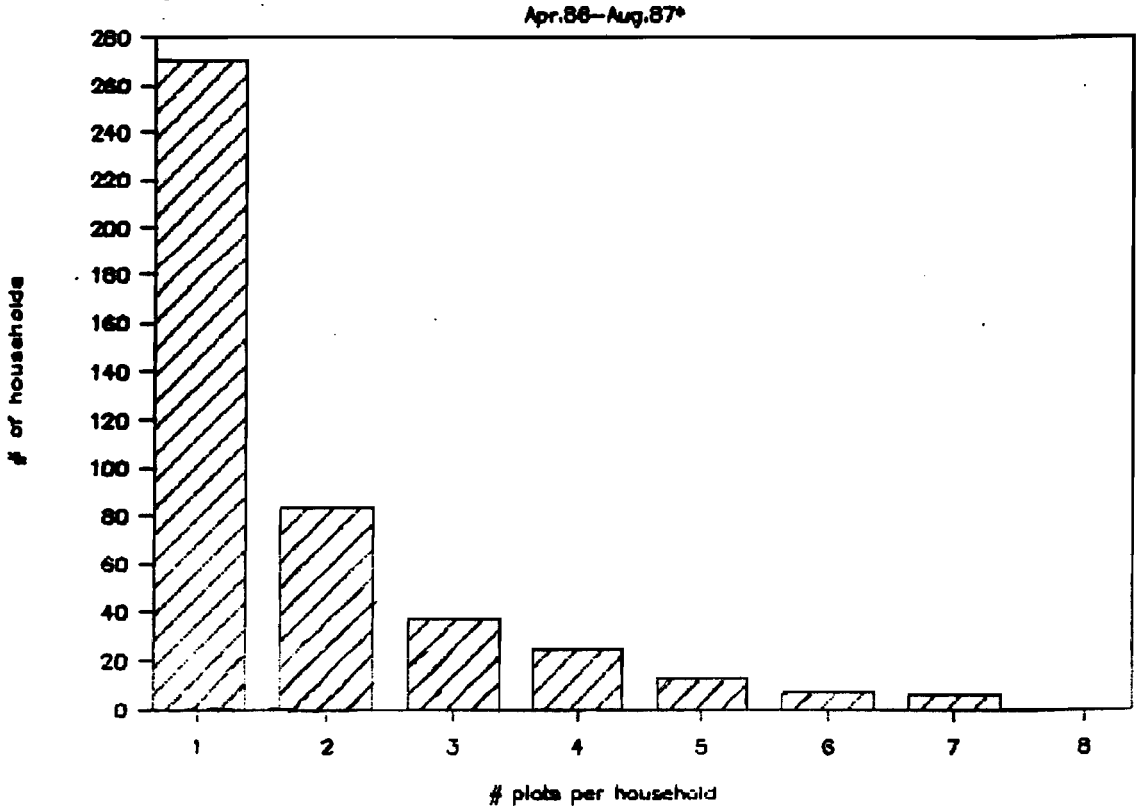


Fig. 4: **Number of plots treated per household**



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B. Fonds-des-Frères, Les Cayes region

In September 1985, the ADS II project commenced soil conservation work at the site of Fond-des-Frères, situated at an altitude 300-350 metres and located some 15 kilometres from Les Cayes. The conservation practice recommended to households was to dig contour canals every 5 meters perpendicular to the prevailing slope and to reinforce the structures with plantings of napier grass and/or leucaena. Following establishment of the living terraces, trees were to be planted along the established contours every 2-3 metres.

The work was initially carried out by combite groups but prematurely terminated due to a dispute arising out of the size of the contribution to be paid by the project to participants. Another project in the same watershed (Cavaillon) directed by the Ministry of Agriculture in Saut Mathurine was engaging laborers at the minimim wage (16 gourdes/day) to do basically the same type of work; as we were giving a contribution of only 4 gourds/day, farmers, knowing we also were associated with the Ministry of Agriculture, believed project agronomists were skimming off the extra money for themselves. A problem here was also that people from outside the immediate area were permitted to be part of the working combites. So it was not their own land they were working on, or not a friend or neighbor's land.

Work resumed in the second season 1986 with a different strategy in which the project worked separately with individual households, the methodology being adopted more successfully in the Jacmel program.

To date, approximately one third of the farmland at Fond-des-Frères has been conserved by the project, 11 ha. through the use of combites in 1985 and 28 ha. by individual households working with the project since the start of 1987. In total, almost three quarters of the land conserved was owner occupied while owner occupied land represents 66% of the land not conserved. The average size of land conserved was 0.43 ha., with an average of 1.13 plots per household.

Labor was the most important expenditure to households in undertaking the conservation work. The construction of contour canals was the most important activity in terms of labor, accounting for 68% of the total time taken to establish the living terraces. Households were more inclined to hire labor for the more time consuming task of digging the canals than for planting of napier grass, leucaena or trees. In total, households spent an average of $4.34 per plot of land conserved for hired labor with the cost of family labor being implicitly valued at $3.48 per plot. The ADS II contribution to households of 1 gourde/2 metres of terrace established provided a gross benefit of $42.40 per average sized plot of land. Subtracting household labor costs from this contribution, participants earned $34.58 for conserving a plot of land with the ADS II project. Households also received an average subsidy of $7.62 per plot of land for plant material

supplied such as napier grass and trees. In all, the total subsidy to households from the ADS II project for undertaking the recommended conservation practices was some $50 per plot or $116/ha. If households had undertaken the recommended practices without the assistance of the project, they would have incurred a cash cost of $ 27.81/ha. or $11.96 per plot of land conserved.

In an evaluation of the ADS II soil conservation practices, all respondents at Fond-des-Frères expressed a willingness to conserve land, regardless of whether they were landholders or sharecroppers/leaseholders. All households recognized the benefits of soil conservation, with 95% of owner occupiers also citing ADS II's contribution of 1 gourde/2 metres terrace established as a reason for undertaking soil conservation activities.

Among the various soil conservation measures recommended, tree planting was the most recognized by households, with the local varieties of bois blanc and bois pélé being the best known and appreciated. Leucaena, although widely recognized for its use as a soil conservation measure, was not as well liked because of its tendency, if unchecked, to establish to successfully and take over cultivated land. Contour canals and napier grass were both widely known and liked by respondents as conservation measures.

3.5.4 Comparison of Traditional and FSR/E Introduced Techniques for Harvesting and Threshing Rice

Objectives

This study was initiated to determine the economic benefits and costs of introduced practices of harvesting and threshing rice relative to traditional methods in the Les Cayes region of Haiti. The study's purpose was to assess the value of such practices to rice farming households. It was hoped that the results of the study could be used in the development of a planned extension program of FSR/E recommended practices.

Methodology

To evaluate the costs and benefits of the FSR/E harvesting and threshing practices, trials were undertaken in March and September of 1987 to measure the time taken to harvest and thresh rice using traditional and introduced practices. In addition, a comparison was made between the ADS II portable thresher and a co-opted one.

The trials involved the selection of seven different sized rice paddy fields with collaborating farmers in the Les Cayes Plain representing in total area some 0.75 ha. Five of these fields were harvested and threshed using ADS II methods and two with traditional techniques. A greater number of fields for recording the traditional methods of harvesting and threshing rice could not be obtained since very few farmers are still using the traditional techniques. The data recorded in the trials which includes the area of the fields, the quantity of rice harvested, and the hours

employed in harvesting and threshing are presented in Table 6 below.

Table 6. Area of land, Quantity of Rice Harvested, and Time Employed using ADS II and Traditional Harvesting and Threshing Methods.

	ADS II	Traditional
Area (ha)	0.5722	0.1646
Yield (kg)	2840	282
Harvesting (Man Hours)	68.2	27.0
Threshing (Man Hours)	62.0	11.6

In a complementary trial, the time employed and quantity of rice threshed using the ADS II portable thresher was compared to that of a co-opted thresher (door). The average quantity of rice threshed by the two threshers per hour was then used to evaluate the efficacy of the ADS II thresher.

Summary

A trial was conducted to compare traditional practices with introduced techniques of harvesting rice with a sickle and threshing of rice with a portable thresher. By implicitly and explicitly valuing the cost of labor, it was shown that the net benefits to rice producing households from adoption of the sickle method of harvesting may be as high $21/year. These savings to the farmer would represent a corresponding loss to farm laborers traditionally employed to pick the rice harvest by hand. The labor saving from the use of a portable thresher was not sufficient to cover its cost. It appears that a much lower priced thresher must be developed before it will be beneficial for most rural households to purchase portable threshers.

3.5.5 Study on the Costs of Production of Principal Crops in the Les Cayes Region of Haiti

Objectives

FSR/E requires good cost of production data so that worthwhile comparisons can be made between recommended management practices with traditional ones. To adequately understand the constraints inherent in the farmer's agricultural system, it is necessary to be aware of all the costs involved in the major activities throughout the farming cycle. This knowledge may also illustrate more efficient methods of utilizing the farming household's input mix.

In on-farm research in developing countries, a common approach to obtain cost of production data is to follow a household's farming activities over a complete agricultural cycle. This regular

monitoring of households will often collect information on labor utilization (household and hired), farm expenditures, and area of land-holdings. Although this is probably the most accurate method to obtain cost data, it is limited by a number of factors, such as; the applicability of the data outside of the housholds interviewed and their respective locales, the considerable resources required to adequately undertake the research, and the time needed to complete the survey and assimilate the information.

The availability of good cost of production data for agricultural crops is very limited in Haiti. For this reason, among others, the ADS II project has implemented a survey in the Les Cayes area that is following, on a weekly basis, the activities of some 20 households. Reliable cost of production information for the interviewed households should be available in the early part of 1988, upon completion of the study. However, given the importance of cost data in evaluating innovations already introduced by the project in its sites of intervention, a much less time consuming study was undertaken in March of 1987. The intent of this mini-survey was to provide preliminary estimates of the costs of the major agricultural activities such as soil preparation, weeding and harvesting, prior to the availability of data from the weekly survey of household activities.

Methodology

One of the major inputs and costs of production in Haitian agriculture is household labor. Unfortunately, to obtain an accurate estimate of this input, one needs to follow household labor over an agricultural cycle and then assign an implicit value (ideally the opportunity cost) to the time engaged in each activity by each household member. Since, at the very least this requires several months of interviewing to obtain, an alternative although much less accurate method of assessing costs of production was used. This involved interviewing randomly selected households about the labor costs for the major agricultural activities in a cropping cycle. In a single paged questionnaire households were asked to estimate the cost of contract labor (including payment in kind) on a 1/16 of a carreau basis (0.0806 ha.) for such activities as soil preparation, weeding, harvesting, etc. for five principal crops; maize, sorghum, black beans, irrigated rice, and upland rice. These crops were chosen because each has been a subject of research by the ADS II project. In addition to contract labor, households were asked to estimate their costs on a 1/16 of a carreau basis for seeds, fertilizer and insecticides for the previous agricultural season. An average of these costs for each activity and crop was then tabulated to find the average charge for contract labor of the major agricultural activities and specified inputs by locale.

The data was collected from 71 households over a three week period in March 1987 from two major sites of intervention of the ADS II Project in Les Cayes. The households were chosen randomly using the quota-sampling procedure (CYMMIT, 1978) based upon population

lists determined from a census of the sites in September 1986. In this method, households were asked a screening question to determine whether they had planted the crop under question the previous season. If they replied in the affirmative, they were interviewed, if not, another household was interviewed until the specified quota of households to be interviewed was fulfilled for each crop.

A draw-back of this methodology is that it can limit the ability of the researcher to generalize about the population as a whole on data combined across stratas (the different quotas to which respondents are allocated in the sampling procedure). For example, in a cost of production survey where there are just two stratas, irrigated and non-irrigated farms, one could not obtain an unbiased estimate of cost of production for irrigated and non-irrigated farms as whole by simply adding data across the two stratas. However, since in this study the objective was to to compare costs within and among stratas (different crops) and not to combine data across crops, this did not present a problem.

The two major sites for the survey, Berault and Fond-des-Freres, are found, respectively, in the Les Cayes plain and a hillside site of some 300 metres. The Berault site consists of three sub-sites in close proximity, whereas Fond-des-Freres encompasses just one location. The household population of the sites and the number of households interviewed by crop are presented in Table 7.

Table 7. Household Population and Sample Size by Crop and Locale

	Location		
	Fond-des-Freres	Berault	Total
Total Household Population	93	510	603
Number of Households Interviewed by Crop			
- Maize	7	9	16
- Sorghum	7	11	18
- Black Beans	7	10	17
- Irrigated Rice	0	10	10
- Upland Rice	0	10	10
Total	21	50	71

Each household interviewed gave data on only one crop. Seven households were interviewed per crop in Fond-des-Freres whereas ten households participated per crop in Berault. Hence, a total of 71 different households interviewed. Due to a confusion in the field on the numbers of households to be interviewed at Berault,

one extra household was interviewed for sorghum and one less for maize. The relatively small number of households interviewed was due to an a priori belief that the contract labor rates would vary little between households by locale and crop. No households were interviewed in Fond-des-Frères regards rice since it is not grown at the site.

Summary of Results
The study provides data on the costs of contract labor and principal inputs for five crops currently under research in the Les Cayes region by the ADS II project. This data does not purport to give the total costs of production but is nevertheless useful in comparing the labour utilization for the principal agricultural activities and in indicating the relative importance of different inputs. The results will also be of use in making comparisons to cost data based upon a survey of weekly activities of some 20 households. This latter survey is due for completion in February 1988. Potential users of the results are cautioned about the high variability of some of the estimates, as evidenced by a high coefficient of variation.

3.5.6 The Raising of Pigs Before and After PEPADEP

Objectives
Before the eradication of pigs in Haiti in 1982-83, so as to eliminate African swine fever, the raising of pigs was an integral part of the rural economy. It is often stated that pigs were the peasant's bank, being sold to cover such expenses as marriages, school fees and emergencies. Their eradication, therefore, would have represented a serious situation in the peasant household reducing not only an important source of revenue generation and protein but also a means of security to cover unforseen expenditures.

Despite the importance of pig raising in the peasant economy before the eradication program (PEPADEP - Projet pour l'Eradication de la Peste Africaine et Developpement Elevage Porcine), the authors know of no study that documents the importance and extent of pig raising at that time and contrasts it to pig raising at present. This information is, however, essential if one is to have a base of comparison to judge the relative successes or failures of the pig reintroduction program.

The resulting studies in Jacmel and Les Cayes were initiated to better understand various characteristics of pig raising in the past and to use this knowledge to assist in the reintroduction of pigs and the improvement of pig raising methods in the ADS II farming systems program. It is hoped the results of the study will be of use not only to ADS II but also to other organizations interested in developing pig raising in Haiti.

Methodology
The ADS II farming systems project at Les Cayes has four major

sub-zones of intervention. The sample for the study there was randomly chosen from these four sites which have a combined population of 603 households (see Table 8).

Table 9. The Household Sample and Population of the ADS II Pig Raising Study

Location	Topography	# Sample H/holds	Total # H/holds
Charlette-Laforce	Plain	20	222
Jogue-Durocher	Plain	20	132
Macieu-Boudet	Plain	20	156
Fond-des-Freres	Mountain	21	93
		81	603

Twenty households were randomly sampled from each site, in addition, the replacement household at Fond-des-Freres was also interviewed to give a sample number of 81. The interviews took place in the last week of January and the first week of February 1987. The questionnaire used was written in Creole and in addition to precoded responses contained space for recording replies not previewed. The questionnaire was essentially divided into two parts; the first, concerning the importance of, and details on pig raising before PEPADEP and the second, which included questions on the attempts made to replace pigs after their eradication and details on pig raising at present. Before the formal interviews, the questionnaire was first tested with three households, following which, revisions were made to improve the clarity of certain questions and precoded responses.

The interviews were conducted by ADS II employees (moniteurs) who are also farmers in the project's sites of intervention. This, coupled with a lot of goodwill between the project and its cooperating farmers, was felt to be sufficient to overcome much of the hesitancy of households to discuss a painful topic in their lives. Nevertheless, two of the 81 respondents furnished patently false information, for example, one household claimed that before PEPADEP it had an inventory of 427 pigs with a total value of $49,000. Significantly, both the households who gave false information were not engaged in a farming activity and hence have limited contact with the project. The inventory and value data from these households were excluded from the analysed results.

Summary of Results

The survey was undertaken on a sample of 81 households from a population of 603 households in four separate sites. Some 94% of the sample households kept pigs before PEPADEP compared to just 7% of households who keep pigs at present. The average number of pigs per household in the past for those raising pigs was almost 10 animals. This contrasts to an average of just two pigs per household for those raising pigs at present.

In evaluating households according to occupation characteristics, there is no reason to believe that the incidence of pig raising was higher for farm households than non-farm households either in the present or the past. No significant difference was found in the incidence of pig raising by households in the past according to whether they lived in the mountains or plains of Cayes.

The importance of pigs for households before PEPADEP is shown in the average inventory value of some $350, some $100 more than the average inventory value per household today. Respondents raising pigs before PEPADEP were also asked to give the importance of the animals in terms of income and food. Over 90% of households claimed pigs were either very important or important in terms of both revenue and food.

The principal reasons given by over 90% of respondents for keeping pigs before PEPADEP include; as means of providing food and income to the household as well as acting as a bank to cover contingencies and major expenditures.

The method of raising pigs in the past is significantly different to what takes place today. Over 98% of households kept their pigs on a "á la corde" system before PEPADEP, this compares to 100% of households raising pigs today who raise their animals in a "porcherie". Further, the reliance on purchased feeds for rearing pigs is much more today than it was before PEPADEP. For those households which keep pigs at present, 100% of them feed wheat bran to their animals and 83% feed concentrates. This compares to just 11% of households feeding wheat bran and 3% feeding concentrates before PEPADEP. In the past also, households fed a greater variety of different types of food to their pigs than is true today.

Regards health status before PEPADEP, the most frequent problem experienced by pigs was fever. In descending order of importance the next most frequent ailments were non-specific external parasites, diarrhea, scabies and hernias. For pigs at the present time, the only recorded ailment was diarrhea, found in the animals of two of the six households currently raising pigs. However, comparison on the health status between the two periods is not possible for a several reasons, not the least being the high incidence of African swine fever before the eradication program.

Only 24% of households raising pigs before PEPADEP attempted to replace pigs with another raising system. The most common replacements being goats, beef cattle and chickens. Of those trying to replace pigs after the eradication program, only 39% of the households experienced a greater or equal success with their replacements when compared to their past pig raising.

Of those households currently with pigs, three purchased the animals themselves, two received the pigs through a donation and one household obtained the pig(s) through an association with

other individuals.

3.5.7 Comparison on the Cost/Returns and Differences in Production between Intensive and Traditional Pig Raising Systems

Objectives
This study had twin objectives, first, to assess the profitability, costs and returns of raising pigs in more intensive systems relative to traditional methods, and second, compare growth rates of animals under the different systems. The overall goal was to use this data to better advise households on recommended management techniques for raising pigs.

Methodology
It was decided to follow on a weekly basis 12 piggeries, six located in the plain sites and six at the mountain site of Fond-des-Freres. In a prepared questionnaire, households were interviewed each week on the quantity, type and cost of feed fed to their pigs, health problems of their animals, and labor costs and other expenses incurred over the previous seven days. In addition, two sows, two boars and two castrates were selected for growth measurements from each of the two raising systems in the plains and mountain sites, hence, giving a total of 24 animals under review. For the improved raising systems where growth measurement were taken, the project coverered the purchase costs of households for feed over the 12 months of the study.

Summary of Results
The results for the complete 12 months of the study will not be available until early 1988, when all information has been gathered. Preliminary results based on eight months of data will, however, be presented prior to the end of 1987 (cf.ADS II Report 54).

3.5.8 Study on the Introduction of Rabbit Raising

Objectives
In the second season 1986, the ADS II project constructed 30 rabbit hutches. Those farmers who assisted in the construction of the hutches were given one free along with a breeding pair of rabbits with the condition that participants were obliged supply to the project two animals of each sex from their first litters. The goal of the study was to identify the problems and costs involved in raising rabbits for the households participating in the intervention. This information could then be used to help in the project's extension program and improve the rate and success of rabbit raising in the sites on intervention.

Methodology
The 30 households participating in the raising of rabbits with the project's assistance were interviewed on a weekly basis to obtain

data on inventory of animals, health problems, state of sanitation in the hutches, type food given to the rabbits, and rearing expenses. This data was checked for errors in the field by a member of the socio-economic team before being collated at the Les Cayes office.

Summary of Results
The rabbits were fed from locally available food and scraps. The most important ingredients were sweet potatoe vines, napier and guinea grass, and sorghum leaves. The average litter size at birth for the rabbits of the participating households was five. There was, however, a very high death rate for the bunnies of some 55% within the first few weeks of life, caused mainly by a lack of awareness in management practices by the households involved. It would seem, therefore, that future encouragement of rabbit raising by the project should be accompanied by more seminars in methods of raising the animals and for care of the young.

3.5.9 Collection of Market Price Data

Objectives
The development of a consistent price series of the major marketed crops in the Jacmel and Les Cayes areas is a precondition to providing reliable estimates of household farm revenue and for comparing the value of the cropping interventions introduced by the project. In addition, such data also provides a means to assess the value of such strategies as increasing crop storage availability to farmers.

Methodology
Price series data was collected on a weekly basis for all the major marketed crops found in the region. Both urban (Jacmel, Les Cayes) and local/regional markets were surveyed. Information was obtained from three different markets in Les Cayes, the urban Les Cayes market, the Maniche market to cover prices for the mountain site of Fond-des-Frères, and the Ducis market to provide prices for the ADS II sites in the plain. In the Jacmel region, market data were obtained from two mountain villages on the Haut Cap Rouge plateau, and two from local sites on the plain (Cyvadier and La Fond), in addition to the urban one in Jacmel itself.

Summary of Results
Quarterly summaries of the price series collected have been circulated to all interested ADS II team members and have proved most useful in evaluating several of the project's interventions. A summary of project data to date are provided in Report # 55, ADS-II Market Price Summaries in Jacmel and Les Cayes.

3.5.11 Rainfall Data

Because rainfall variability has such an important role in understanding crop variability, rainfall statistics have been

obtained from several points in both the Berault and Maniche/Fonds-des-Frères zones of Les Cayes, and Haut and Bas Cap Rouge in the Jacmel region. These data are included in project annual reports.

3.5.11 Recommendations

For specific results and policy recommendations for the individual studies, the reader is urged to consult the relevant ADS II reports. A more general discussion of the experiences of the socio-economic team and suggestions of how research efforts of future projects can be improved are presented below.
A major goal of a rural development project should be to ensure the sustainability of its successful interventions. A principal aim of technical assistance should, therefore, be to ensure the continuity of activities by counterparts long after the termination of technical support. To be assured that this takes place, counterpart training should be considered as one of the principal responsibilities of technical assistance staff. It is suggested that at the beginning of every planning period, the personnel training proposed along with its objectives, methods, and costs should be specifically documented. At the end of the period, the training as with all activities, should be evaluated for its successes and failures and what is further required. Consideration should also be given to the fact that counterparts sent overseas for long-term training may not return to the project and that others should, therfore, be trained to ensure continuity of the work.

An important factor in the sustainability of a project is the contacts it can make with other organizations, both governmental and private. These organizations, in turn, can help the work of team members both during and after the project's life. It should be appreciated, however, that such collaborative efforts are not easy to implement. Often a large project may even have problems keeping its own staff informed of activities even without communicating its efforts to those outside the project. A minimum goal should, however, be to convene meetings that make all interested parties aware of the project's efforts, and, wherever possible, allow for collaborative research or extension. The time and effort taken by a project in communicating its activities will probably be more than repaid in a more effective implementation of its interventions.

In undertaking socio-economic research in Haiti, as is true in many developing countries, it is advised to avoid over-elaborate studies. At the beginning of a project, it is especially advised to commence with relatively simple studies not requiring long or complicated questionnaires. In this manner, the socio-economic team can provide training to its members while at the same time enabling the team leaders to become aware of staff capabilities. The ADS-II project, for this reason, has made a conscious effort to avoid intensive, long term socio-economic surveys which, while

professionally interesting and relevent, rarely result in timely or relevent results to the field program itself.

For data collection, it is strongly recommended that a formal system of verification of data take place in the field and again at a central/regional office prior to data entry. Establishing a micro-computer data entry capacity in both Jacmel and Les Cayes were found to dramatically increase efficiency and timeliness of data entry and analysis, not to speak of simple accounting and word-processing needs. It has been the experience of the ADS II project that improper completion of questionnaires has been a major source of experimental error. Improved interviewer training and greater supervision in the field would reduce this problem. It is advised that in regular monitoring of activities the data be verified and entered within one month of its collection so as to ensure corrections can be made while it is still feasible.

In the tools used, the ADS II project has emphasised a formalized questionnaire approach to its research. Such an approach, however, can by its relative inflexibility, miss important characteristics of the household social structure and attitudes. Hence, a broad mix of informal surveys, case-studies of certain households, group discussions, and formal surveys are seen as the best means of answering the an interdisciplinary team's research questions.

4.0 NATIONAL RECURRENT AGRICULTURAL SURVEY (NAS)

The Rural Economics and Statistics component of the project has evolved into three distinct sub-components:

(1) Rural economics support for the farming systems component of the project. Because we believe it is not possible to separate "farming systems" from its rural economics dimension, rural economics in this project are discussed only under the farming systems component. The project, as it was organized initially, tended to split agricultural research from socio-economic research, which contradicted the farming system's orientation for this component in the contract proposal.

(2) National Recurrent Agricultural Statistics. This is represented by the field survey, data entry, and analysis staffs required for implementing, twice a year, a national scale survey for agricultural statistics using an open segment, area frame methodology.

(3) Geographic Information System. A requirement of the project was to "fully utilize all relevant existing data gathered from previous or other on-going agricultural projects in Haiti" and "to maintain an on-going and reliable agricultural data base for Haiti". After considerable research on the options available to accomplish this task, the team selected the Michigan State University CRIES/Geographic Information System software as the most powerful, economic, and flexible tool to accomplish this task. We believed being able to manipulate statistics within their correct spatial contexts would ultimately prove important for maximum use of national/regional statistics.

The National Recurrent Agricultural Survey will be discussed in this section, while the Geographic Information System will follow in section 5.0.

The recurrent National Agricultural Survey (NAS) component of the ADS-II project was effectively launched in April, 1985 in response to the project mandate to "strengthen the MARNDR operational and administrative capacity to conduct and coordinate a national program of agricultural information collection, analysis and dissemination". As described above, this component was originally designed to build upon agricultural information systems developed in the FSR areas of intervention and proceed by project termination only to the national information system implementation phase. However, pressures within and outside of the Ministry lead to a decision in early 1985 to expand and greatly accelerate the level of effort. Despite this, the original contract agreement with the University of Arkansas was never ammended to reflect this expanded scope.

As a result of the expanded ADS-II project effort, at project termination, significant progress toward the establishment of the NAS can be reported. The socio-economic questionaire design and

field testing experience of the FSR component, as well as selected rural economics farming systems personnel, were effectively transfered to the NAS; the laborious tasks of national level area frame stratification, sample allocation and selection, and segment identification have been completed; field work for two complete national and three department level preliminary surveys have been complete; reports on preliminary and the first national level surveys have been published; analyses of all surveys including the first national level survey have been finished; a supervisory and enumerator corps of some 40 and 280 persons (cf. Appendix 1), respectively, has been established and trained; a data entry corps consisting of 10 data entry personnel and a programmer/ director has been created. A three member statistician/analysis team has been trained, which together with the data analysis corps and the appropriate hardware and software, are capable of inputing, processing and reporting all data generated by the recurrent surveys; and two individuals have been selected for advanced long-term training in the U.S.. More importantly, for the first time ever, reliable agricultural information stemming from a national probability sample is becoming available to decision makers both within and outside the Ministry.

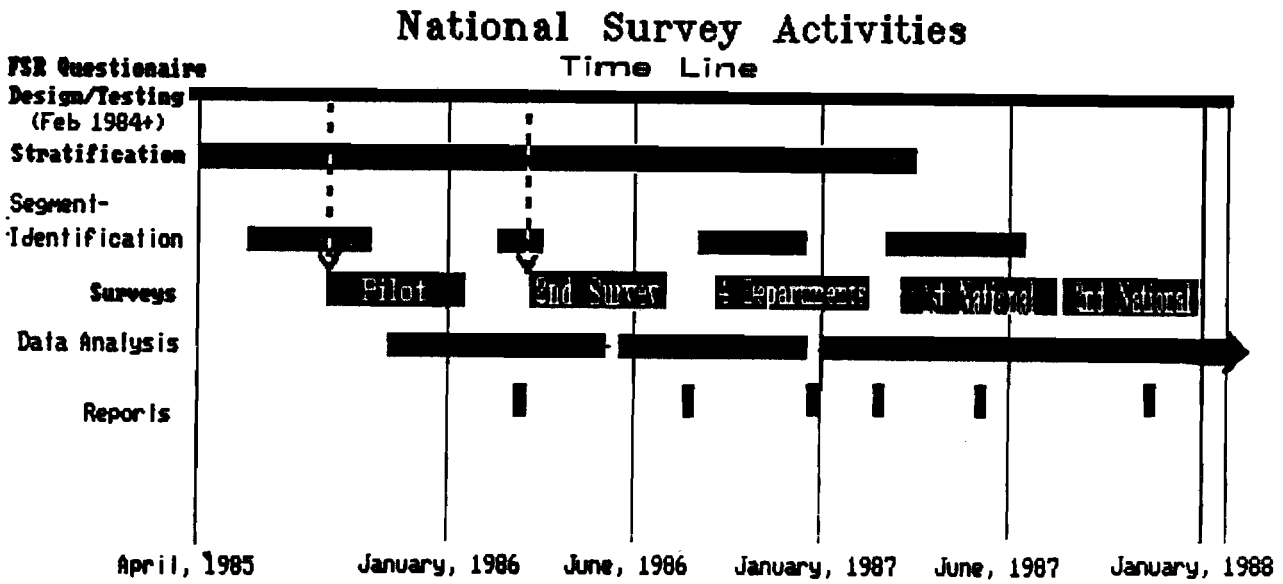
4.1 History and Development of the NAS

The following briefly summarizes the historical development and progress of the NAS within the ADS-II project in Haiti. A more detailed account of activities can be obtained by consulting the project annual reports and other documents cited below. Table 9 and Figure 5 present a graphic overview of the scope and development of the NAS.

Table 9: Numbers of Segments and Households in NAS Surveys

Survey Season	Survey Number	Departments Surveyed	Segments in Sample	Households in Sample
2nd Season 85	1	Sud	56	2750
1st Season 86	2	Sud	40	1750
2nd Season 86	3	Sud	40	1817
		Grand-Anse	40	1398
		Sud-Est	40	923
		Ouest	55	1177
1st Season 87	4	Sud	40	1812
		Grand-Anse	40	2015
		Sud-Est	42	1371
		Ouest	55	1354
		Centre	40	1005
		Artibonite	33	1649
		Nord-Ouest	28	1025
		Nord	36	1776
		Nord-Est	34	1727
2nd Season 87	5	Approximately the same numbers expected as for previous survey.		

Figure 5



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Early in 1985, a decision was made by the MARNDR and USAID to adopt the area frame methodology favored by the USDA/NAS for the recurrent agricultural survey instead of the household list frame favored by the US Department of the Census. With the help of TDY USDA/NAS personnel, who provided technical support throughout the project, ADS-II began immediately in April of that year with preparations to conduct a pilot survey in the Departement du Sud the following September. Personnel were trained in the methodology and stratification procedures. Taking into account the nature and distribution of Haitian agriculture, decisions concerning strata definitions and optimal segment and count unit sizes were taken. It was also decided to adopt the "open segment" area frame methodology which called for interviewing all resident farm operator families residing in the segments irregardless of where their gardens or animals were located.

In July of that year, stratification was completed and an initial sample composed of a total of 55 segments in six survey strata was allocated and selected. Working with the rural economic component of the FSR team, survey instruments and training materials were made ready for the initial supervisor training sessions in August. Enumerator training sessions followed and the pilot survey began field operations in October and was completed in January, 1986.

Throughout the pilot survey, significant problems due to the socio-political situation and the lack of supervisor and enumerator familiarity with the methodology were noted. Logistic problems were also severe. Nevertheless, important information concerning the nature of agriculture in the Departement du Sud, and more importantly, technical information concerning the survey structure, methodology and conduct in Haiti was obtained. This information was later used to improve the sample allocation within the Departement du Sud and other departments and improve generally survey management.

Although the next survey (first season, 1986) was originally programmed for the Sud and Grand Anse departments, continuing logistics as well as national political problems forced the survey to remain in only the Sud where the re-allocated sample was tested. Stratification for other departments continued throughout the summer and by fall, a sample for the four southern departments was allocated and selected. The survey for the second season, 1986 was conducted in the four departments from October through January, 1987. Meanwhile, the stratification effort continued and was completed for the entire country by March, 1987.

In March, a week-long intensive survey methodology workshop for all supervisors at the regional, departmental and assistant-departmental level was held. This workshop served as the kick-off for the first national-level survey for the first season of 1987. Concurrent with the workshop, sample allocations and selections were made for the remaining five departments. From this point until June, most senior staff time was devoted to

identifying segments with supervisors and enumerators in these departments. The survey field operations were begun in May and were finished by September. Field work for the second national survey (second season, 1987) began in October and will finish by January, 1988.

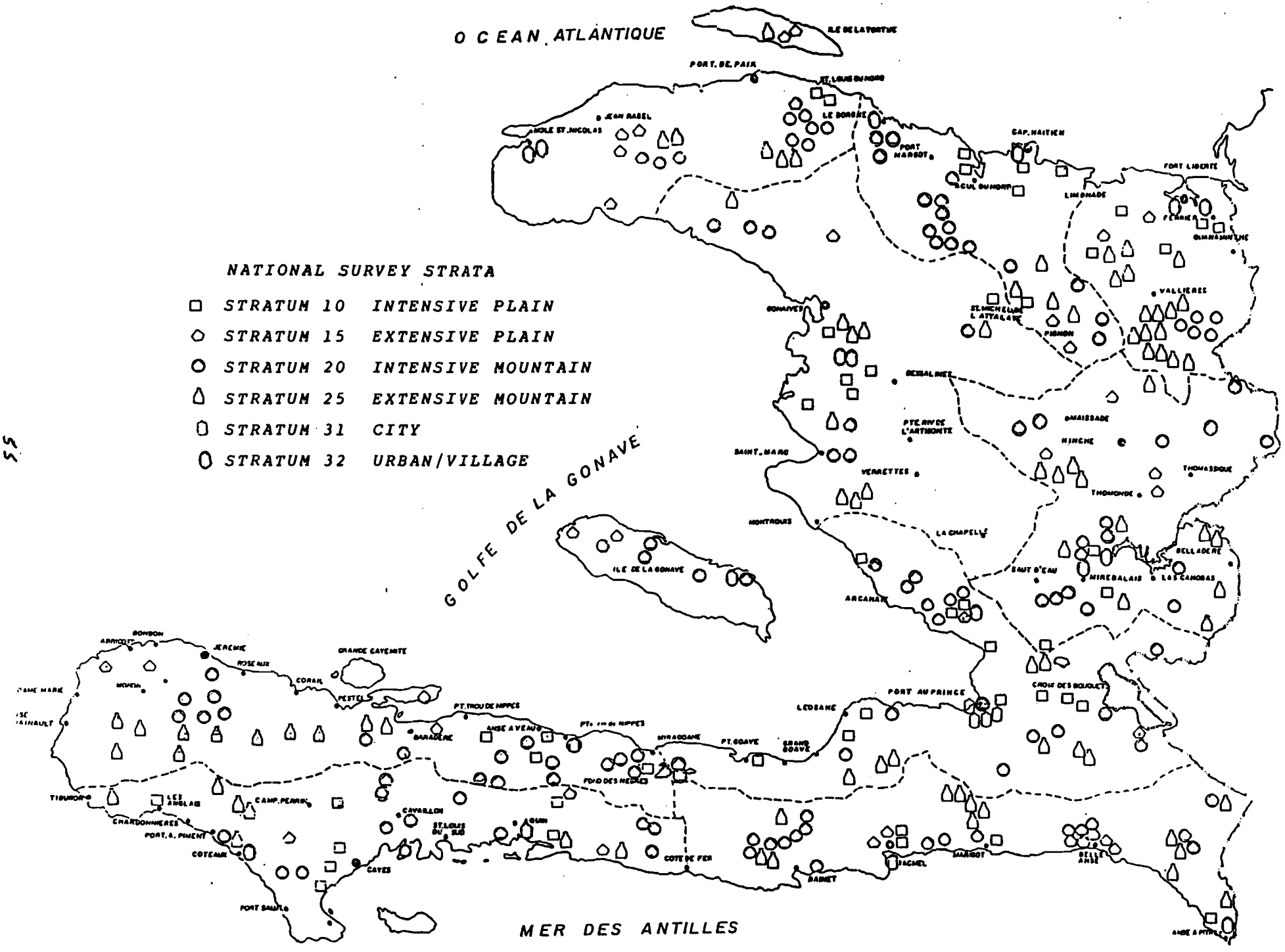
4.2 Accomplishments

In moving quickly from the pilot to the national level, the suvey has experienced some growing pains. The logistic and managerial problems connected with a twice yearly survey of an estimated 13,000 families in 343 segments generating some 25,000,000 bits of information each year are formidable (cf.map following page). Additional technical assistance is needed to resolve outstanding technical issues and assist in policy analysis. Nevertherless, high quality information is already available and, given a typical learning curve for all personnel involved, end users of the information can realistically expect better, more timely and higher quality information in the future.

A major accomplishment of the project has been the assembly and training of a large, dedicated staff in many different skill areas. Currently, survey staff is composed of some 284 enumerators, 43 supervisors, 10 key punchers, one programmer/director, three statistician/analysts, and one NAS division leader. The NAS supervisory staff has available five all-terrain vechicles and 36 motorcycles. Data entry/analysis uses 8 IBM PCs, 2 IBM XTs and a Compaq Deskpro 386.

The administrative structure established to manage the survey is headed by the Director of Statistics, who provides overall leadership to the national survey, data entry/analysis and the GIS/Landsat divisions. The day-to-day operations of the survey are under the leadership of the national survey coordinator. Supervison of the survey at the national level is divided into four regions composed of from two to three departments, headed by a regional supervior who has an automobile available to facilitate training and survey logistics. In each department, the survey is under the leadership of a departmental supervisor and assistant departmental supervisor. During survey field operations, up to three under-supervisors in each department are employed on a temporary basis. Day to day functions of the data entry section is supervised by a programmer/directrice. Operational activities of the GIS/Landsat division is also headed by a director.

The data entry programs for the first survey were written in the K-MAN applications language. Beginning with the second survey until the present, DBASE III PLUS has been used exclusively. The use of DBASE III has speeded up the data entry process and at the same time allowed for limited logic checks at entry. DBASE III also has the advantage of a straighforward data conversion to the LOTUS data structure. Because of the complexity of the information and the large numbers of variables, data from each


OCEAN ATLANTIQUE
NATIONAL SURVEY STRATA
STRATUM 10 INTENSIVE PLAIN
STRATUM 15 EXTENSIVE PLAIN
STRATUM 20 INTENSIVE MOUNTAIN
STRATUM 25 EXTENSIVE MOUNTAIN
STRATUM 31 CITY
STRATUM 32 URBAN/VILLAGE
GOLFE DE LA GONAVE
ILE DE LA GONAVE
MER DES ANTILLES
PORT AU PRINCE
JEREMIE
CAP HAITIEN
GONAIVES
PORT LIBERTE
LIMBONADE
VALLIERES
THOMASSIQUE
THOMONDE
BELLADERE
LAS CAHOBAS
MIREBALAIS
CROIX DES BOUQUETS
LEOGANE
ARCAHAIE
SAINT MARC
VERRETTES
MONTROUIS
LA CHAPELLE
SAUT D'EAU
PETERIVIERE
DESSALINES
PORT MARGOT
ILE DE LA TORTUE
PORT DE PAIX
ST LOUIS DU NORD
LE BORNE
MOLE ST NICOLAS
JEAN RABEL
GRANDE CAYEMITE
ROSEAUX
CORAIL
PESTEL
BARADERE
ANSE A VEAU
PTE TROU DE NIPPES
MIRAGOANE
PT GOAVE
GRAND GOAVE
FOND DES NEGRES
COTE DE FER
BAINET
RACHEL
MARGOT
BELLE ANSE
ANSE A PITRES
CAYES
CAVAILLON
ST LOUIS DU SUD
AQUIN
COTEAUX
PORT A PIMENT
CHARDONNERES
LES ANGLAIS
TIBURON
CAMP PERRIN
PORT SALUT
ARRIGOT
BONBON
JACMEL

segment is stored in three different files: information on crop areas is placed in a Parcel file, information on animals and family members is placed in a Menage file, and general information concerning the entire household is placed in a Divers file.

Macros written in the Lotus applications language have been used exclusively for data analysis and report generation. Lotus has the advantage of spreadsheet data visiblity and allows the analyst to easily generate graphic illustrations of survey results. Lotus images may also be brought into Drhalo software for more sophisticated presentations and color displays.

4.3 Additional NAS Outputs: Annotated Bibliography of NAS Documents

ADS-II DOCUMENT NUMBER:

8. Assessing of Requirements for Designing and Implementing a National Agricultural Survey in Haiti, M. Cuevas,D. Megill, January 1985. (English). US Bureau of the Census report detailing methodology and program for developing a list frame for the NAS.

9. Assessment of Requirements for Designing and Implementing a Pilot Area Frame Survey in Haiti, R. Albert, February 1985. (English). USDA/NAS report detailing methodology and program for developing an area frame for the NAS.

11. Construction of Area Sampling Frame, for Haiti, Department du Sud, P.Blackwood, April 1985. (English). First USDA/NAS TDY report outlining stratification procedures.

13. Frame Verification and Sampling, Blackwood,Davies, June 1985. (English). Second USDA/NAS TDY report outlining sample allocation, selection and analysis procedures.

15. Preliminary Results of Pilot Agricultural Survey in the Department of the South, Haiti, Bertelsen, Dupont, and Swanson, ADS-II, March 1986 (English, French). Preliminary results of the first survey.

21. The Pilot Agricultural Survey in the Department du Sud: Methodology and Conclusions, Bertelsen, Dupont, and Swanson, ADS-II/MARNDR, August 1986. (English,French). Methodology and conclusions drawn from the first survey.

22. Results of the Pilot Agricultural Survey in the Department du Sud: Second Agricultural Season 1985 Bertelsen, Dupont, Jean-Baptiste, Swanson, ADS-II/MARNDR, August 1986. (English, French). Complete results of the first survey.

24. Preliminary Results of the Second Agricultural Survey in the Department Du Sud, Haiti, - First Agricultural Season (February - July 1986). ADS-II /MARNDR, December 1986. (English, French).

Preliminary results of the second survey in the Departement du Sud.

26. Agricultural Statistics for the Department du Sud, Year 1985-1986: Second Season 1985 - First Season, 1986, ADS-II/MARNDR, April 1987. First yearly statistics for the Departement du Sud.

27. A Geographical Atlas of the Department du Sud: Comparaison of Strata for the National Agricultural Survey, Bertelsen Mcguire, and Brown, ADS-II/MARNDR, April 1987. Utilization of the Geographical Information System (GIS) to investigate the efficacy of the stratification effort in the Departement du Sud.

28. Yield Estimates for Eight Crops in the Department du Sud, Haiti: Results from the National Agricultural Survey, Bertelsen and Swanson, ADS-II/MARNDR, April 1987. Estimates based upon farmer recall of yields for eight crops over three agricultural seasons and a variety of volumn measures in the Departement du Sud.

30. Implications of National Survey Data on Farming Systems Applied Research, Bertelsen, Grafton and Swanson. Estimated value of information derived from the NAS for agricultural policy decision in the Departement du Sud.

31. Preliminary Results for National Survey Statistics in 4 Departments of Haiti, ADS-II/MARNDR. Report on preliminary statistics for the first survey in the four southern departments.

34. An Improved Sampling Scheme for Estimation the Area and Yield of Sugar Cane in Haiti, Marshall Ashley, ADS-II/MARNDR, April 1987. (English). A proposal to resolve the methodological problem of underestimating the rare occurance of large sugar cane producers inherent in the area frame sample.

38. A Study to Improve the Accuracy of Coffee Estimates for the National Agricultural Survey in Haiti, Marshall Ashley, ADS-II/MARNDR, June 1987. (English). A study to assess the possible extent of the methodological problem of underestimating the rare occurance of large coffee plantations.

39. Preliminary Results of the First National Agricultural Survey: First Season, 1987, ADS-II/MARNDR, November, 1987. (French). Preliminary statistics for all nine departments.

4.4 NAS Recommendations

The NAS has come a long way in a short while. What is required more than anything is time to consolidate the gains already achieved and fine-tune the methodology and frame. To facilitate this process, technical assistance for the survey should continue

for at least two more years. During this period, any bold new methodological departures should be avoided. Technical assistance emphasis should be placed in the following areas:

1.) The determination of the appropriate sample size. The final number and allocation of segments at the national level will have a large bearing on survey recurrent costs and the MARNDR's eventual willingness and ability to assume full survey responsiblity. Variances of key variables, relative segment costs and acceptable levels of precision must be determined and used to make this decision. Once these variables and future funding levels (from whatever source) are established and the technical analysis of one complete year's data is complete, this process can go foreward.

2.) Data reliability. Projections indicate that the present sample size will produce coefficient of variation (CV) estimates of sampling error for most key variables fall within acceptable limits at the national level. Consequently, to the extent that data reliablity is a problem, the problem stems from non-sampling error. Efforts to study nonsampling error have been complicated in the past by the somewhat delicate nature of this type of work and the unsettled socio-political climate in Haiti. These complications are likely to persist for some time in the future. Nevertheless, it is recommended that research into NAS non-sampling error be undertaken in a few priority areas. Specifically,

a). the methodological error of the open-segment area frame resulting in underestimation of rare occurences such as large landholdings should be investigated further. Landsat imagery and the possibility of using multiple frames for some crop variables are presently being investigated. The appropriateness of these methodologies need to be assessed.

b). a limited sample of segments should be re-delimited by highly trained staff. Results should be compared to previous delimitations, biases determined and conclusions drawn concerning the appropriateness of the initial delimitation effort and the need to re-delimit additional segments.

c). Objective area and yield estimates should continue for subsamples in all departments. Results of these efforts will permit an assessment of any bias which might exist in farmer recall of this data.

d). Verification surveys conducted by supervisors in all departments should continue as a means of systematically checking and evaluating enumerators' work.

3.) Questionaire content. Once base-line information is established at the national level, many socioeconomic questions

may be dropped from the questionaire or asked infrequently. The reduced space which results could reduce data processing time and costs or be used for additional questions.

5.0 GEOGRAPHIC INFORMATION SYSTEM/REMOTE SENSING UNIT

The first activities aimed at creating a geographic information system/remote sensing (GIS/RS) capability within the ADS-II project got underway in December, 1985. At that time a group of 10 selected staff and technical assistance advisors went to Michigan State University (MSU) for training and discussions on the organization of the system at a two week workshop conducted by the Comprehensive Resource Inventory and Evaluation System (CRIES) project. Since that time rapid progress has been made in four general areas: 1) data base development, 2) staff training, 3) administrative structure, and 4) product output. Each of these four areas is separately treated below. This section will ends with a brief discussion of the future course of development for the system.

5.1 Data Base Development

At the end of the two week training workshop at MSU in December, 1985, it was decided to leave one of the team members, Seige Poteau, in East Lansing to begin to create a nation wide data base. M. Poteau used the facilities of the CRIES Project for three months to digitize and create an initial data base containing nine layers of information. Details of this data base are found in ADS-II Report number 17, Initial Digital Resource Data Base for Haiti, April. 1986.

In April, 1986, a digitizer and computer equipment were installed at the Ministry of Agriculture, Damien and work continued in Haiti on the nation wide data base. A first task was the creation of a file containing the Sections Communales boundaries. Unfortunately, M. Poteau decided to leave the project at this time, which meant that this activity served as the training exercize for a new team of digitizing technicians, Mona Cadet Thomas and Arold Guillaume. As this map is very complex (564 variables) and its digitization was a learning experience for the digitizers, progress was slow and many errors were made. Once the errors were corrected, this data base proved to be extremely useful. It has been used by the Secretary of State for Agriculture as the basis for a complete revision of the boundaries of the Districts Agricoles. The publication of two maps in April, 1987 showing the boundaries of the Departements and the Districts Agricoles at the same scale created an awareness in the Ministry that the boundaries of the Districts Agricoles needed to be greatly altered to correspond with the mandates of Haiti's new constitution. Between April and September, 1987 the Sections Communales data base was used to produce eight seperate maps that were circulated to decision makers in the Ministry and returned to be modified. In September the present configuration of 22 Districts Agricoles based on aggregations of Sections Communales was finally selected. The map of these administrative divisions is now a part of the data base will be used as the basis for a series of statistical reports in the future.

The Sections Communales data base was also used to recreate the data bases of the Communnes, the Arrondissments, and the Departements; each of which is an aggregation of the Sections Communales. Previously these data bases had been created using the Commune boundaries that had been digitized at Michigan State (see ADS-II Technical Report 17, Initial Digital Resource Data Base for Haiti, April, 1986).

By the time the Sections Communales was finished the new digitizing team was well trained and capable of undertaking an even larger, more complex task: digitizing the elevation contours for the entire country. The data for this data base was digitized from the one hundred nine 1:50,000 topographic maps which constitute the complete coverage for the country. Digitization of this data was completed in June. Editing of this data layer has proved to be an enormous task, even with the cooor interactive display and editing software which came on line in May, 1987. The complexity of this data layer, which contains contours at intervals of 20, 40, 60, 80, 100 and every subsequent hundred meters, makes the task of locating errors within a file an extremely time consuming process. In addition, we have experienced a large number of problems at the edges of the maps where two sheets have to be mosaicked together without a visable break. Since there are one hundred nine sheets, this problem has been very large indeed. Further delays in the creation of this data base were caused by the political upheavals in July and August, 1987 in which we lost about three fourths of our working hours. As a result, the elevation data base, which we originally anticipated having completed by November, 1987 will probably not be in final form until about January, 1988. Once the elevation data base is completed, it will be used to create national data bases of both slope and aspect. Since no data entry is involved, this should be a relatively rapid process.

Other maps that have been digitized include a map of Haiti's road system, a map of District Agricole Boundaries, a map of Malaria Treatment Zones for Service National d'Eradication de la Malaria (SNEM), and a map of the location of the country's major mineral resources for the Bureau of Mines. An attempt was made to digitize a map of the Buffin/Campbell Ecological Classification of the country, but there was a problem with the UTM coordinates on the map and it will need to be re-digitized.

In addition to the digitized files, a number of files have been created through the analysis of the digitized data. As mentioned above files of the Commune, Arrondissement, and Departement boundaries have been created by grouping the Sections Communales boundaries. We have created a file of population density stratified by Section Rural using data obtained from the Institute Haitiene de Statistiques et Informatiques (IHSI). A file has been generated with the available data on malaria occurance in conjunction with SNEM, also by stratifying Sections Communales data. Work is continuing on the Landsat land use/land cover

classification. This has been completed and digitized by MSU for the Departements du Sud and Grand Anse, and work is nearly finished in the Departement de Sud-Est.

In June, 1987 work got underway in establishing a data base of the Sub-Sub-Watersheds (watersheds of fourth order streams) for the entire country in conjunction with the Secretariat d'Admanagement de Bassins Versants (STAB). STAB had mapped 444 seperate watersheds of this magnatude, and these were digitized and edited. Creation of this data base was used as a training exercise for Nahel Romain, the systems analyst who will be in charge of the GIS system located in STAB. This data base is being used to create a seperate statistical atlas for each of the country's 31 primary watersheds on the pattern of the Atlas Statistique de le District Agricole des Cayes, ADS-II Technical Report 25, March, 1987.

In November, 1987 work began on establishing a data base containing the locations of all the soil conservation and reforestation projects in Haiti. This data was also collected by STAB. This work is expected to be completed in January, 1988.

The national geographical information systems data base currently consists of files of two resoultions: 100 and 300 meters. The low resoultion (300 m) files are:

1. -	HLRSR	Sections communales
2. -	HLRCOMM	Fontieres Politiques de commune d'Haiti
3. -	HLRARRON	Fontieres Politiques d'arrondissement d'haiti
4. -	HLRDEPT	Limites des Departements d'haiti
5. -	HLRPLUV	Pluviometrie d'Haiti
6. -	HLRHZ	Classification Ecologique de Holdridge
7. -	HLRCU	Occupation de l'Espace
8. -	HLRPD	Repartition de l'Habitat
9. -	HLRAGDST	Districts Agricoles d'Haiti
10.-	HLRSP	Potentialite des Sols
11.-	HLRSC	Stations Climatologiques
12.-	HLRBVP	Bassin Versants Principaux
13.-	HLRBVS	Bassin Versants Secondaires
14.-	SSBV	Sous-sous bassins versants
15.-	HLRPOP	Population par section communale
16.-	HLRR	Routes
17.-	MINESITES	Les mines d'Haiti
18.-	HLRHY	Hydrologie

The high resolution (100 m) files are:

1. - 5370ELEV to 5870ELEV	Elevations d'Haiti
2. - 5370PB - to 5870PB	Limite des Commmunes
3. - 5370HY - to 5870HY	Hydrologie

Each of these high resolution data sets contains 27 files, each of which corresponds to the 1:100,000 topographic map sheet of the same number. Complete details of these data bases can be found in

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ADS-II Technical Report number 45, Current Status of The Digital Resource Data Base For Haiti, November, 1987.

Apart from the national data base, the project has created a number of special purpose, local data bases. These include:

1) a data base near Cayes-Jacmel for the localization of malaria focii in association with SNEM.
2) a data base of the District Agricole Des Cayes.
3) Two sub-watersheds in the Artibonite Bassin for the Department of Natural Resources.
4) Two Sections Rurales for Professors in the Faculty of Agriculture and Veterinary Medicine (FAVM).
5) Two regions in Northern Haiti for U.S. AID.
6) The Haute Cap Rouge Watershed for the Jacmel Farming Systems Research project.
7) A rice plot ownership data base for the rice crop trials research in the Les Cayes area.
8) A data base of the Departement du Sud in support of the National Survey.
9) A data base of all of the sampling segments for the National Survey
10) A data base of the National Survey Stratification of the country.

Since January, 1987 work has also been proceeding on establishing linkages between the GIS and the Lotus 123 spreadsheet program. Linkages have been developed that allow the transfer of data in both directions: from Lotus to the GIS and from the GIS to Lotus. Lotus data bases that corespond to each of the GIS data files have been created and are available for distribution.

5.2 Staff Training

Since the original training workshop in December, 1985 at MSU, the formal and informal training of the GIS/RS staff has continued unabated. At this point, all of the GIS staff have recieved enough training to effectively perform their basic function. Details on this training can be found in the ADS-II 1986 Annual Report, ADS-II Technical Report #39. Continued on the job training has been and will be aimed at teaching the members of the team the skills involved in each others jobs, both to minimize the effects of any future staff turnover, and to improve cooperation within the team.

In May, 1987 a new digitizing technician, Duche Chery, joined the GIS team. He has since been trained in all of the functions related to his job.

Since June, 1987, the focus of training has shifted away from training members of the team, towards training people outside the GIS unit, with the aim of establishing independant GIS analytic capacities in other parts of the Ministry. Beginning the second week in November, 1987 three members of The Secretariat

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d'Admanegement de Bassins Versants (STAB), Nahel Romain, Ann Trombley, and Edevise Monocia joined Fritz Jean from the FAMV, Rudi Mentor from the National Agricultural Survey and the six staff members of the central GIS resource unit, M. Hyppolite, M. Prosper, MMle. Simon, Mdme. Thomas, M. Guillame, and M. Chery in a formal workshop series. This workshop met 2 days a week for three weeks. The purpose of this workshop series was to train the people who will operate the independant GIS systems in the FAMV, the National Agricultural Survey and STAB, as well as develop a basis for cooperation between the central GIS resource unit and the independant satellite systems.

5.3 Administrative Structure

It has become apparent that the demand for services from the GIS greatly exceeds the output potential of the system. In response to this problem we have developed a strategy of establishing a central GIS resource unit to make the analytic and training capacities of the GIS more widely available to potential users within MARNDR. The objective of this unit is not merely to provide GIS output products to users, but identify tasks in the Ministry which can have GIS functions usefully integrated into their overall information management systems, and create "satellite" GIS systems in the offices responsible for carrying out these tasks. The GIS resource unit will provide the following services to the satellites :

1) assistance in establishing new data bases
2) training
3) a repository of seldom used hardware
4) research into new GIS applications and techniques
5) linkage and coordination of data exchange between satellites
6) management of national data bases

For any information management system, the establishment of the data base is the most critical stage. Careful planning is required to design a base of information that will be useful in providing information that the users of the system are likely to require. Once a data base is planned, it needs to be created. In any data base management project data base creation is inevitably the most costly and time consuming stage. A small project would concievably have trouble justifying the high up front costs involved. The GIS resource unit provides experienced personnel and specialized hardware that can greatly reduce the cost and time required for this process, and thereby increase the likelihood that satellite systems can be successfully initiated.

The need for training is obvious. Certainly, training must be provided at some level to establish new data bases, and will be one of the most important functions of the GIS resource unit. As

described in the previous section, this training is already underway with presonnel from the FAMV and STAB.

Most of the functions of the system can be performed on an IBM PC compatible computer. This configuration is very inexpensive and already widely available in offices throughout the MARNDR. Other functions of the GIS require more elaborate and expensive equipment, such as a digitizing tablet or a color ink jet printer. While the optimum hardware configuration for any particular data base will vary according to the needs of its users, it is essential to have a repository of equipment that users need only occasionally. The GIS resource unit will be able to spread the costs of specialized hardware over a number of projects.

The research function of the GIS resource unit is critical. GIS represents an entirely new tool for managers of natural resources in third world settings. A great deal of research is needed to find the best ways to integrate this tool into the normal decision making process. This means that there remain not only unanswered technical questions about how to best present the data, but perhaps even more important questions about the optimum organization of the administrative infrastructure to insure the flow of information from the system to decision makers. Supplying the answers to these questions will continue to be an important function of the GIS resource unit.

One of the major advantages expected from the widespread use of the GIS is to increase the access of decision makers in all of the MARNDR departments to information collected and stored by other departments. The GIS resource unit will provide a central clearing house for access to all of the satellite GIS data bases. The unit will not only assist decision makers in finding existing information collected and stored by the satellite GIS systems, but will also attempt to establish formal information channels to those data bases.

Finally, the satellite systems will maintain specialized data bases that meet the functions of the particular department the system serves. The GIS resource unit is needed to manage the general purpose national data base that has already been created. This data base will be essential to give a national context to all of the specialized satellite data bases. However to remain useful, it will have to be updated and enlarged as new data becomes available. Central storage of this national data base is also essential to insure that all of the satellite systems have access to it.

In support of this strategy, we have developed the following policy to both ration the limited GIS services that exist, and encourage and increase the supply of such services through the establishment of independant satellite systems:

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5.4 Policy Covering Access to GIS Services

1) All requests for GIS services will be submitted to the Director-Adjoint GIS/Landsat (Mr. HYPPOLITE) on a form he will provide for this purpose.

2) Mr. HYPPOLITE will consult with the GIS Staff and produce a time and cost estimate for the work.

3) Work will be scheduled according to the following priorities:

(a) Services to activities of the ADS-II Project.
(b) Services to activities of the MARNDR and Faculty of Agriculture (FAMV/CRDA)
(c) Services to other Ministeries, Agencies and PVO's.

Within each category, priority will be given to activities aimed at providing an independent GIS analytic capability.

4) Costs will be charged as follows:

(a) ADS-II Project activities will not be charged.
(b) MARNDR and Faculty activities will be charged for the cost of materials (paper, xeroxing, drafting supplies, etc..) and use of equipment.
(c) All others will be charged for the time of hardware operators, in addition to the charges specified in B).

Activities undertaken to establish independent GIS analysis capabilities will incur no cost.

Implementation of this policy has several important administrative implications, most of which will increase the burdens of M. Hyppolite. First is the form which will be used to request GIS services. The purpose of the form is to make the party requesting services define their specific needs in terms that the GIS staff can comprehend and fulfill. Many requests have come in for, "all the information you have on ...". Without knowing how the information is being used or the format that will best convey the information, there is no way this request can be honored. Thus the process of filling out the request form will serve to define and document the scope of the work. A copy of this form, titled Demande D'Information, is included on the next page.

The element of cost introduces another administrative implication. Costs have to be accounted which means record keeping systems must be developed to allocate costs to specific projects and insure their collection. The system is based on a form which each worker fills out when performing each task which records the time and materials used for each task. These forms

are then used as a basis for computing the amount charged for each project. A copy of this form, titled Feuille de Travail, is also included below.

A final administrative element concerns the documentation of the contents of the data bases. The names of the attributes of each layer of the data base along with a histogram of their distribution have been placed in a Lotus spreadsheet file. This system places the information in an electronic format that can easily be searched and sorted into a form appropriate to a wide variety of potential users. ADS-II Technical Report 45, Status Report on the Digital Resource Base of Haiti, is a product of this system.

5.5 Product Output

In spite of the fact that the GIS has been mainly in a data base development mode since its inception, the system has been used to produce a wide variety of final products. Most, but not all, of these products have been produced to demonstrate the capabilities of the system. This was certainly the case with ADS-II Technical Report #25, Atlas Statistique de Le District Agricole Les Cayes. This publication, which contains 24 maps, 18 graphs, and 19 statistical tables, all electronicly produced, was intended to demonstrate the contents of the data base and capabilities of the system to administrators in the MARNDR.

Our two most widely distributed maps are 1:500,000 maps of the Districts Agricoles and the Departements. These maps have been very well received. As discussed above the publication of these two maps lead to widespread discussion and the eventual modification of the Districts Agricole to reflect the changes in administrative structure mandated by the new Haitian constitution. This revision has given us a perfect opportunity to demonstrate the speed, ease, and simplicity of updating the data base, which is one of the principal advantages of the GIS over traditional cartographic techniques.

Two projects have been undertaken to demonstrate the system to agencies outside the MARNDR. Two maps at a 1:500,000 scale have been produced for the Bureau of Mines which show the location of all of th mines and mineral deposits in the country. Further cooperation is planned with this agency in creating a national data layer based on the geologic structure of the country.

The second inter-agency project has been in cooperation with SNEM. The GIS has been used to produce two national maps: one showing the progress of the mosquito spraying program and the other showing the levels of malaria infection in the country. Work is now in progress on establishing a data base system which will map focal points of malaria infestation. A paper describing this system was written for presentation at an epidemiology conference held in September, 1987 in Paris.

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In another demonstration project a series of six maps of two sub-watersheds in the Artibonite basin have been produced for the Division of Natural Resources. Work is currently in progress on producing a similar series of maps for a third sub-watershed in the same region.

Maps have also been produced to assist two Faculty members in the Faculty of Agriculture and Veterinary Medicine (FAMV). Both of these projects consisted of simply retrieving and printing maps of the data base contents for a particular Section Rurale.

In addition to demonstration projects, a number of products have been produced to directly support the activities of ADS-II. A GIS data base and a series of maps has been created covering the Departement Du Sud to illustrate publications of the National Survey. These are ADS-II Technical Report # 27, A Geographical Atlas of the Department du Sud: Comparison of Strata for the National Agricultural Survey, and ADS-II Technical Report #31, Preliminary results for National Survey Statistics in 4 Departments of Haiti.

A data base designed to aid record keeping and mapping of data on rice trials has been developed for use in Les Cayes. ADS-II Technical Report # 35, Geographically Referenced Crop Trial Records: A Case Study, gives a detailed description of this system. This paper was presented at the Farming Systems Research Symposium at Fayetteville, Arkansas, Oct. 21, 1987, and the Geographic Information Systems Conference in San Fransisco, California, October 28, 1987.

As has been previously mentioned, work has been completed on a ten map series showing the new Sections Communals which were created by the recently ratified National Constitution. This map is available in two scales: 1:250,000, and 1:500,000 and is accompanied by a booklet listing all the Sections Communales by Commune, Arrondissement, and Departement, as well as the code used for each Section in the data base file.

A watershed specific (Morija) data base in the Haute Cap Rouge zone was created in support of the farming systems research in that area. Data on field boundaries, ownership/land tenure, crop change from one season to the other, location of rock terraces, paths, household residences, were mapped at 1 meter X 1 meter resolution and analyzed using GIS facilities.This data base is described in ADS-II Technical Report 37, Geographically Referenced Watershed Systems Research: A Socio-economic Application in Haiti, which was presented at both the Farming Systems Research Symposium and San Francisco GIS conference mentioned above.

Our color display cababilities have been used to produce a wide variety of color images which are intended to demonstrate the capabilities of the system. These have been used to compile a slide show which has been presented at a variety of meetings in

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the Ministry of Agriculture, USAID, and as poster session presentations at both the Fayetteville and San Fransisco conferences.

The GIS resource unit now has the following map products available for distribution:

Map of Sections Communales (1:250,00 and 1:500,00)
Map of Agences Agricoles (1:500,000)
Map of Districts Agricoles (1:500,000)
Map of Departements (1:500,000)
Map of National Survey Strata (1:500,000)
A nine map series of the Sections Communales by Departement (1:250,000)

The 1:250,000 maps are sold for $10.00, and the 1:500,000 sheets are sold at $2.50. In addition, ADS-II Technical Report #41, Liste des Departements, et Des Sections Communales, is available for $6.00. To date, some 60 of these publications and maps have been distributed to various organizations, including:

Office of the Minister of Agriculture (MARNDR)
Office of the Secretary of State for Agriculture (MARNDR)
Service d'Irrigation (MARNDR)
Service de Ressources Naturelle (MARNDR)
"Projet FREST" (MARNDR)
Service Des Travaux Publiques
Pan American Development Foundation
Projet Agro Forestiers
USAID
Centre International D'Agriculture Tropical
Madian Salagnae (M.S.A.)

Finally, the entire digital data base, as described in ADS-II Technical Report 45, Status Report on the Digital Resource Base of Haiti, is available on 15 double sided, double density floppy diskettes. This includes all of the documentation and Lotus 123 worksheet files.

5.6 Future Directions

Plans for the future activities of the GIS/RS are based on the original premise of the CRIES GIS that a GIS operating on an IBM PC compatable machine could decentralize the GIS operations to a wide user community. Now that a GIS center has been established and is already being used by an increasingly large cliental, both within and outside the Ministry, the question becomes how should the center be employed to accomplish this goal of decentralization. We at ADS-II believe that the best organizational structure for the future of the GIS will to maintain a center of GIS innovation. The functions of this center, in regard to GIS, will be to assist potential users to establish their own data bases, designed to meet there own needs.

The purpose of this center will be to provide training, support and research activities, while encouraging other potential users to establish independent systems that will put them in a position to do the analysis and production work for themselves.

The sophistication of these independent analysis centers will vary according to the needs of the individual user. The hardware could be as simple as an IBM PC with an Epson dot matrix printer. We are currently working on a project in the Les Cayes Plain, which is described in detail in ADS-II Technical Report # 35, Geographically Referenced Crop Trial Records: A Case Study, that will be used on exactly this system configuration. The emphasis will be on encouraging each user to assume as much responsibility for processing his or her own data as possible, relying on the central Statistical and Geographical Information Center for training, technical advice, and the use of infrequently used hardware, as described above.

ADS-II currently views the following organizations as prime candidates for developing an independent analysis capability:

1) Minister of Plan
2) Minister of Health
3) Service d'Eau
4) SNEM
5) Bureau des Mines

Now that the GIS resource unit has become an operational entity, future efforts in data base creation, staff training, administration and production will be directed towards creating satellite systems. The goal will be to create a critical mass of both trained personnel and computer hardware that will enable the system to withstand staff turnover and administrative reorganization, while at the same time providing decision makers with high quality, timely information

6.0 TRAINING PROGRAMS

6.1 Introduction

Training has been an exceedingly important part of the project, and has occurred at a number a levels simultaneously:

IN-COUNTRY
- (1) farmer level
- (2) Faculty of Agriculture student summer on-farm training
- (3) resident agronomists
- (4) program agronomists and statisticians

OUT OF COUNTRY
- (1) short term training (workshops, specialized training)
- (2) long term degree training

A list of most of the participants in overseas short term and long term training is given in the following pages, with details

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concerning the component of the project represented, the type of training followed and where, and the duration. Also included here was specialized training given by the project to selected groups within and without the project. Not given here are lists of farmers who have benefited directly from both long and short term in-country training: the list would be too long. We do estimate, however, having worked with at least 860 and 750 farmers respectively in Les Cayes and Jacmel for periods of at least six months each. Some 45 and 22 farmer/research monitors were trained in Jacmel and Les Cayes respectively in soil conservation/ agro-forestry methods, laying out of field trials, etc.

Training activities for the farming systems program are outlined briefly below. Similar activites for the national agricultural survey and the geographic information system have already been discussed in sections 4.0 and 5.0, respectively.

6.2 Farming Systems Training

Major activities in which agronomists, students, monitors, and farmers were trained are summarized below:

(1) Setting up Field Trials: This involved measuring specific farmer fields and staking out the trial plots according to the experimental design selected. This was followed by the planting of the plots using the protocol prepared for this purpose, the measurement of the exact amounts of inputs for each plot according to the demands of the particular experiment and the preparation of the proper signboards to designate each treatment within the trial plot. The monitors did most of the actual work involved in setting out the researcher and farmer managed trials; usually under the supervision of a resident agronomist.

(2) Monitoring an Experiment: This activity required all field personnel to observe the trials once set up, and to apply the inputs like fertlizer or appropriate spraying on schedule (or as needed). This also meant making sure all the field operations such as weeding, replanting missing hills and thinning, insect and rodent control, etc. were done by the farmer cooperator on time. Note: In farmer managed trials, monitors observed if the required activities were done (but did not do it themselves if not done).

(3) Record Keeping: Keeping appropriate records about activities around the field trials was an important part of the training for all field personnel. At the beginning of each planting season, ADS-II staff prepared a work plan after discussion with field personnel (agronomists, monitors, farmers) and, most important of all, taking into account the previous season's experience. This work plan included all activities planned for the current season, the layout, experimental design, and number of trials to be established, the inputs required, the cost of inputs, the objective and justification for each type of activity (see annual reports), and lastly, the technical information (seed rate,

	NOM	VOLET	FORMATION/SUJET	LIEU	DATE
CT	MERISIER Jean Rony	SP	Agrosylviculture	Institut Agri. Tropicale (IITA)	00/06/86 -
CT	DUPITON PAUL J. C.	SP	Agrosylviculture	IITA	00/06/86 -
CT	FRANCOIS Maurois	SP	Integrated Pest Management	University of Missouri	02/06/85 - 19/07/85
CT	FLEURANTIN Gardy	SP	Seminaire Systeme de Production	Kansas State University (KSU)	05/10/84 - 14/10/84
CT	JACQUES Sorel	SP	Seminaire Systeme de Production	KSU	05/10/84 - 14/10/84
CT	DUPONT Ernest	SP	Seminaire Systeme de Production	KSU	
CT	VALBRUN Jean	SP	Livestock Crop Management	University of Missouri	02/06/85 - 19/07/85
CT	JACQUES Sorel	SP	Atelier de travail Martinique	Martinique	09/05/85 - 11/05/85
CT	DUPONT Ernest	SP	Seminaire Systeme de Production	KSU	05/10/84 - 14/10/8
CT	ALEXIS Reynold	SP	Seminaire Systeme de Production	KSU	13/10/85 - 16/10/85
CT	FRANCOIS Maurois	SP	Stockage et Commercialisation	KSU	09/06/86 - 25/07/86
CT	DOUYON Martine	SP	CRIES Geographic Info. System	Michigan State Univer. (MSU)	04/11/85 - 15/11/85
CT	WERLEIGH Georges	SP	Seminaire Systeme de Production	KSU	13/10/85 - 16/10/85
CT	POGNON Hodolphe	S	Seminaire Economie Developpement	University of Michigan	29/06/86 - 22/08/86
CT	DUPONT Ernest	S	CRIES Geographic Info. System	MSU	04/11/85 - 15/11/85
CT	DESRUISSEAUX Gaspard	S	CRIES Geographic Info. System	MSU	04/11/85 - 15/11/85
CT	POTEAU Seige	S	CRIES Digitization	MSU	04/11/85 - 26/01/86
CT	DESRUISSEAUX Gaspard	S	CRIES Geographic Info. System	MSU	06/02/86 - 20/02/86
CT	HYPPOLITE Carlo	S	CRIES LANDSAT	MSU	04/08/86 - 15/08/86
CT	HYPPOLITE Carlo	S	CRIES Geographic Info. System	MSU	06/02/86 - 20/02/86
CT	SAM Marie Rose	TA	CRIES Geographic Info. System	MSU	04/11/85 - 15/11/85
CT	SIMON Marie France	S	CRIES Geographic Info. System	MSU	04/11/85 - 15/11/85
CT	DUPONT Ernest	S	CRIES LANDSAT	MSU	04/08/86 - 15/08/86
CT	SEME Fritz	RN	CRIES LANDSAT	MSU	04/08/86 - 15/08/86
CT	PIERRE-LOUIS Raoul	RN	CRIES Geographic Info. System	MSU	04/11/85 - 15/11/85
CT	MONDE Carl	FAMV	Atelier de travail Martinique	Martinique	09/05/85 - 11/05/85
LT	JACQUES Sorel	SP	PH.D Agronomie/Genetique/Mais	University of Arkansas	14/07/86 - 10/88
LT	DUPONT Ernest	S	MS Statistique/Agriculture	BUCEN/GWU	9/82 - 2/84
LT	FLEURANTIN Gardy	SP	MS Effet du Zinc sur le Mais	University of Arkansas	15/07/85 - 10/87
LT	ALEXIS, Raymond	SP	MS Tubers/Sweet Potatoes	Kansas State University	6/87 - 6/89
CT	RICHARD Lyonel	SP	Evaluation des Projets de Deve.	University of Minnesota	01/09/85 - 30/09/85
CT	MATHELIER Antoine	MARNDR	Evaluation des Projets de Deve.	University of Minnesota	01/09/85 - 30/09/85
CT	SAM Marie Rose	TA	Administrative Backstopping	University of Arkansas	02/09/86 - 05/09/86
CT	SIMON, Marie-France	SIG	Geographic Informations Workshop	San Francisco	25/10/87 - 31/10/87
CT	ROMAIN, Nahel	SIG	Geographic Informations Workshop	San Francisco	25/10/87 - 31/10/87
CT	MERISIER, Jean-Rony	SP	Farming Systems Workshop	University of Arkansas	11/10/87 - 23/10/87
CT	VALBRUN, Jean	SP	Farming Systems Workshop	University of Arkansas	11/10/87 - 23/10/87
CT	DENIS, Joseph	SP	Alley Cropping Course	Institut Agri. Tropicale (IITA)	
CT		SP	Alley Cropping Course	Institut Agri. Tropicale (IITA)	
CT	BEAULIEU, Guy	SP	Farming Systems Workshop	University of Arkansas	11/10/87 - 23/10/87
CT	ALLEN, Linda	S	Lotus 123/DBase III course	Computec, Port-au-Prince	
CT	SIMON, Marie-France	S	Lotus 123/DBase III course	Computec, Port-au-Prince	
CT	DORVIL, Rene	UPA	Introductory Micro-Computer Course	ADS-II Data Analysis Center	6/87 - 9/87
CT	LOMIER, Gerald	UPA	Introductory Micro-Computer Course	ADS-II Data Analysis Center	6/87 - 9/87
CT	VICTOR, Agronome	UPA	Introductory Micro-Computer Course	ADS-II Data Analysis Center	6/87 - 9/87
CT	JOSUE, Agronome	UPA	Introductory Micro-Computer Course	ADS-II Data Analysis Center	6/87 - 9/87
CT	HYPPOLITY, Agronome	UPA	Introductory Micro-Computer Course	ADS-II Data Analysis Center	6/87 - 9/87
CT	PIERRE, Aubelin	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	JULES, Evanel	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	SANON, Jereme	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	JN.PIERRE, Jn.Claude	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	AURE, Sombien	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	ETIENNE, Amose	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	MARECHAL, Elva	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	MAITRE, Josette	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	CRIE, Daniel	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	ETIENNE, Wesner	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	EGALITE, Abraham	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87

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CT	DESULME, Milfort	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	JN.MARIE, Eliassin	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	NOISETTE, Wiland	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87
CT	JN.PIERRE, Dieuseuse	SP	Soil Conser./Agro-Forestry Training	ADS-II Jacmel Morija Watershed	1/87 - 6/87

	NOM	VOLET	FORMATION/SUJET	LIEU	DATE
LES CAYES ZONE					
FL	CHARLESTON Enock	SP	Agronome Resident	Cayes	01/12/85 - 30/09/86
FL	DERREAUX Bonny	SP	Agronome Resident	Cayes	00/08/85 - 00/01/86
FL	FANCOIS Maurois	SP	Agronome Resident	Cayes	01/03/86 - 30/09/86
FL	HERARD, Max-Paul	SP	Agronome Resident	Cayes	15/05/84 - 15/12/84
FL	JANVIER Emmanuel	SP	Agronome Resident	Cayes	15/05/84 - 15/12/84
FL	LUCIEN Jean Kinault	SP	Agronome Resident	Cayes	01/10/85 - 30/09/86
FL	MARESCOT M. Luc	SP	Stagiaire 2eme annee	Cayes	15/07/84 - 15/09/84
FL	MAYARD Myriam Duret	SP	Agronome Resident	Cayes	15/05/84 - 15/12/84
FL	MOEZIL Paulette	SP	Agronome Resident	Cayes	01/03/86 - 30/09/86
FL	NUMA Joane	SP	Stagiaire 1ere annee	Cayes	15/07/84 - 15/09/84
FL	PAUL Claude Dupiton	SP	Agronome Resident	Cayes	15/05/84 - 15/12/84
FL	ROBERT Simon Levelt	SP	Agronome Resident	Cayes	01/04/85 - 30/09/86
FL	VALBRUN Jean	SP	Agronome Resident	Cayes	15/05/84 - 15/12/84
FL	VERRET Louis	SP	Stagiaire 2eme annee	Cayes	15/07/84 - 15/10/84
FL	YVES-GEORGES Jn.Fran	SP	Agronome Resident	Cayes	01/03/86 - 10/86
FL	CELOGE, Henry	SP	Agronome Resident	Cayes	07/87 - 12/87
FL	EUSTACHE, Jn.Orel	SP	Agronome Resident	Cayes	07/87 - 12/87
FL	LUCIEN, Jn.Kinault	SP	Agronome Resident	Cayes	07/87 - 12/87
FL	DESIR, Sixto	SP/S	Coordinateur de Formation	Cayes	01/10/83-19/12/83
FL	JEAN, Wilfred	SP	Agronome du Projet	Cayes	
FL	FLEURINTIN, Gardy	SP	Agronome du Projet	Cayes	01/02/84-15/07/85
FL	ALEXIS, Reynold	SP	Agronome du Projet	Cayes	03/10/84-30/08/86
FL	HILAIRE,Sebastian	SP	Agronome du Projet	Cayes	15/07/85-15/07/86
FL	EDME, Serge	SP	Agronome du Projet	Cayes	09/01/86-01/30/88
JACMEL ZONE					
FL	BONHOMME Gertho	SP	Agronome Resident	Jacmel	01/04/85 - 15/12/84
FL	DELIEU, Jn.Claude	SP	Agronome Resident	Jacmel	01/09/85 - 30/09/86
FL	CARVIL Ophy Nicolas	SP	Agronome Resident	Jacmel	01/04/84 - 02/12/84
FL	FRANCOIS Maurois	SP	Agronome Resident	Jacmel	01/02/85 - 01/03/86
FL	GEORGES Parnell	SP	Agronome Resident	Jacmel	01/12/85 - 30/09/86
FL	JOSEPH Denis	SP	Agronome Resident	Jacmel	01/03/86 - 30/09/86
FL	JOSEPH Lenide	SP	Agronome Resident	Jacmel	01/04/84 - 15/12/84
FL	LAURORE Guito	SP	Agronome Resident	Jacmel	01/04/84 - 15/12/84
FL	MERISIER Jean-Rony	SP	Agronome Resident	Jacmel	01/09/85 - 30/09/86
FL	SAINT-VIL Jean Jorel	SP	Agronome Resident	Jacmel	15/01/84 - 15/12/84
FL	PAQUIOT, Ketty	SP	Agronome Resident	Jacmel	01/04/84 - 15/12/84
FL	MIHU, Gary	SP	Agronome Resident	Jacmel	01/04/84 - 15/12/84
FL	CIMLUS, Yves	SP	Stagiaire 2eme annee	Cayes	15/07/84 - 15/10/84
FL	PIERRE-CHARLES,Ferry	SP	Stagiaire 2eme annee	Cayes	15/07/84 - 15/10/84
FL	THOMAS, Woody	SP	Stagiaire	Cayes	17/07/85 - 10/01/85
FL	EUSTACHE, Orel	SP	Stagiaire	Cayes	17/07/85 - 10/01/85
FL	VILMA, Joseghat	SP	Stagiaire	Cayes	17/07/85 - 10/01/85
FL	SILDON, Emmanuel	SP	Stagiaire	Cayes	17/07/85 - 10/01/85
FL	MESIDOR, Roosevelt	SP	Stagiaire	Cayes	17/07/85 - 10/01/85
FL	PHAREL, Gardy	SP	Stagiaire	Cayes	17/07/85 - 10/01/85
FL	DESROSIERS, Josette	SP	Stagiaire	Cayes	17/07/85 - 10/01/85
FL	BUISSERETH, Geoffin	SP	Agronome Resident	Cayes	01/03/86 - 30/09/86
FL	MOSSIL, Paulette	SP	Agronome Resident	Cayes	01/03/86 - 30/09/86
FL	GEORGES, Parnel	SP	Agronome Resident	Cayes	01/03/86 - 30/09/86
FL	YVES-GEORGE,Jn.Fran.	SP	Agronome Resident	Cayes	01/03/86 - 30/09/86
FL	DENIS, Joseph	SP	Agronome Resident	Cayes	01/03/86 - 30/09/86

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FL	ADELBERT, Oril	SP	Stagiaire	Cayes	7/86 - 10/86
FL	SCOTT, Rico	SP	Stagiaire	Cayes	7/86 - 10/86
FL	COMPERE,Pierre-Willy	SP	Stagiaire	Cayes	7/86 - 10/86
FL	PIERRE, Moise	SP	Stagiaire	Cayes	7/86 - 10/86
FL	PIERRE, Rodney	SP	Stagiaire	Cayes	7/86 - 10/86
FL	BAYARD, Budry	SP	Stagiaire	Cayes	7/86 - 10/86
FL	LAINE, Manes	SP	Agronome Resident	Cayes	07/87 - 12/87
FL	CHERUBIN, Carole	SP	Agronome Resident	Cayes	07/87 - 12/87
FL	BAZELAIS, Jackson	SP	Stagiaire	Cayes	07/87 - 12/87
FL	JEAN, Invy	SP	Stagiaire	Cayes	07/87 - 12/87
FL	CHERY, Yvelt	SP	Agronome du Projet	Cayes	01/10/83-01/02-84
FL	JACQUES, Sorel	SP	Agronome du Projet	Cayes	01/01/84-15/07/86
FL	JEAN, Wilfred	SP	Agronome du Projet	Cayes	01/10/84-01/06/87
FL	AUSTIN M. C.	FAMV	Introduction Informatique	P-au-P	
FL	CHERY Guylene	FAMV	Introduction Informatique	P-au-P	
FL	Etudiants (2)	FAMV	Introduction Informatique	P-au-P	
FL	FALL Abdu	FAMV	Introduction Informatique	P-au-P	
FL	JEAN-JEUNE Karly	FAMV	Introduction Informatique	P-au-P	
FL	LAVIOLETTE Lyonel	FAMV	Entrainement Logiciel MSTAT	P-au-P	
FL	POLYNICE Yves	FAMV	Introduction Informatique	P-au-P	
FL	SERAPHIN Leonvil	FAMV	Introduction Informatique	P-au-P	
FL	POMAIN, Nahel	STABV	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	TROMBLEY, Ann	STABV	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	MONOCIA, Edevise	STABV	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	JEAN, Fritz	FAMV	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	MENTOR, Rudi	SIG/S	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	HYPPOLITE, M.	SIG/S	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	SIMON, Marie-France	SIG/S	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	THOMAS, M.	SIG/S	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	GUILLAME, M.	SIG/S	GIS Analysis,Training	P-au-P	08/11/87-10/12/87
FL	CHERY, M.	SIG/S	GIS Analysis,Training	P-au-P	08/11/87-10/12/87

PEACE CORPS

CHANDLER, Holly	SP	Pig program/Soil Conservation	Cayes	1986/1987
JENKINS, Peter	SP	Soil Conservation/Agro-Forestry	Jacmel	1986/1987
MCGUIRE, Mark	S	Statistics/Field Enumeration	Haiti wide	1986/1987
WEIS, SIEGFRID	SP	Farm Machinery	Cayes	1987 (one month)
WEIS, Patricia	SP	Data Entry	Cayes	1987 (one month)
KLOWCHOW, Robert	SP	Bruny Rice Farm,Extension	Cayes	1987
WELBORN, Bryan	SP	Agricultural Extension	Cayes	1987 (one month)

Key: CT= Courte Terme (Short Term Training)
LT= Longue Terme (Long Term Degree Training)
FL= Formation Locale (Local In-Country Training)
S Statistics Component
SP= Systemes des Production (Farming Systems Component)
SIG= Systemes d'Information Geographique (Geographic Infor.Systems)
FAMV= Faculty of Agriculture, Univ. of Haiti
UPA= Unite de Programmation Agricole (Ministry Program Planing Unit)

Farmer Monitors trained over the life of the project total some 45 for Jacmel and 15 for Les Cayes. Training included measuring out limits on field plots on farmer fields, keeping farm records, measuring yields, taking rainfall data, collecting data on farmer pig programs etc. Their names are not included here.

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density, input dosage, pest control advice, etc.). The work plan then became a field book which also contained the data sheets to be filled out for each experiment by the monitors and checked out for accuracy by the agronomists on a weekly basis.

Each monitor and agronomist was to carry the field book at all times and make the record keeping as up-to-date as possible by site visits and data collection. In reality, depending on the agronomist or resident agronomist in charge, this procedure varied considerably in application. Agronomists were also required to keep a data file onto which they recorded the raw data as it came in from the field. They were trained to process this and send it in to the project for analysis and interpretation. During the last two years of the project, we encouraged them to do as much of this analysis themselves by use of hand held calculators or a micro-computer set up in the field office and using the MSTAT statistical software program.

Farmer monitors were also trained in harvesting of plots, weighing the harvested samples and testing them, with agronomist help, for moisture content using ditital electronic moisture meters. Harvesting and preparing raw data for analysis is a very difficult task, yet we found that the monitors learned to do the job admirably and, after a few seasons, could establish a trial, monitor it, and collect the harvest data without the help of an agronomist (though these were usually present).

It has been the policy of the project to hire farmer/monitors from the zones where they lived. This was a very wise decision because these people knew everyone in their communities and easily found farmers to collaborate with the project in various activities. This policy also permitted the program to have people on site location on a permanent basis and requiring little travel (a bicycle was provided). Project agronomists and resident agronomists, on the other hand, often went to Port-au-Prince during critical times, and the work, in their absence, was carried on without interruption by the monitors. Credit should therefore be given for any success the ADS-II project has realized to these monitors who generally worked very hard at very low salaries ($80 -$100/month).

The project trained a number of student interns from the Faculty of Agronomy (FAMV) in Port-au-Prince, who were in their 2nd or 3rd year of collage - giving them, usually for the first time, first hand experience with farmers. These students stayed with the program for 3-6 months helping agronomists and monitors set up field experiments and collect data. Some of these later stayed on to become resident agronomes.

The project had also been designed to accept 12 end of 4th year interns each year, who owed the government 12 months of applied work in the field to offset the cost of their education (they were to be assigned to ADS-II for 6 months, then somewhere else for remaining 6 months). As part of this internship, a memoir had to

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be prepared and completed before actual graduation could take place. These "resident agronomists" as they were called, proved in reality very difficult to obtain in the required numbers. We rarely had more than 8 assigned (out of 12) at any one time. It was also difficult to plan our field program around people who could be reassigned in the middle of an agricultural season (September/October). This frequently happened. It also became evident that the 6 months budged in project was not sufficiently long to develop a good training program. By early 1986 we had revised their training to 1 year assignments. Eventually, some of these resident agronomists were hired on as agronomists to the project after completing their academic requirements.

Other Training Activities: Monitors were also trained to build rabbit and pig pens as animal husbandry became an integral part of the program in late 1985. They kept records and observed the progress of rabbits, pigs, and goats. In the mountain sites of Fonds-des-Freres (Cayes) and Haut Cap Rouge (Jacmel), monitors have been trained in soil conservation work, setting up contour levels on slopes with an "A level", and have been trained to help farmers organize to either dig the soil conservation ditches or construct rock terraces and plant them with napier, leucaena, and tree seedlings. Monitors in Fonds-des-Freres have also learned to set up a small nursery for the needs of the immediate community. In Jacmel a government nursery near the site fulfills the same purpose.

An important part of the training for farmers was to participate in project activities (both researcher and farmer managed trials) where they learned by observation or practice. Often, it was the agronomist/researcher who learned from the farmers and their experiences. The project also organized many formal field days timed to coincide with specific periods of the agricultural cycle (planting, harvest). Farmers would come from many different localities to visit the experimental sites and interact with the cooperating farmers, sharing observations/comments. This proved an important extension process because, if they liked what they say, they would invariably tell their neighbors and new varieties/activities were spread. During these field days, agronomists, monitors, and participating farmers present would answer questions raised by the visitors.

In addition to the project transporting local groups of farmers from surrounding regions to visit the project sites, we also occasionally brought in people from much further. Farmers were brought from as far as Thomazeau in the Artibonite valley to participate in one rice harvest field day in Les Cayes. At another time, a large contingent of first year students from the agricultural school in Damien (FAMV) visited project sites in Cayes and Jacmel. Cooperating farmers were also on several occasions taken from project zones to visit sites in other parts of Haiti, once to visit Irish potato and cabbage growers in the Kenscoff area, another time to visit soil conservation work done in the Fursi/Kenscoff area by Victor Wynn. On both occasions we

encouraged farmers to talk to farmers about what they were doing. We feel these trips were particularily useful in encouraging farmers to adopt new methods.

6.3 Short/Long term training Orientations

It was our belief that before a person should benefit from being sent overseas for short term or long term degree training, he or she first had to have proven a committment to excellence and field work with the project. As a result, we did not begin to send anyone away until during the second/third years of the project. None of the long term trainees have yet returned to take up positions within the program, though Mr. Fleurentin is expected back mid-1988. Three other MS level candidates were to have left during the summer of 1987 (in statistics, and agricultural economics) but were not permitted to leave because contract funding ends Jan.31,1988. These candidates (Levelt, Mentor, Deruisseaux) will apparently be funded through Targeted Watershed Project funds, though, as yet, they have not left. We had also hoped to permit two other young agronomists (Merisier and Valbrun) to pursue MS level agronomy training.

PROJECT PUBLICATIONS

DOCUMENT #

1A. **ADS-II Technical Assistance Proposal**, presented to USAID, April 1983. (English)

1B. **Survey Questionnaire Form (51 pp.) for Reconaissance Survey**, Richard Swanson, George Werleigh, ADS-II, Port-au-Prince, Haiti, April 1984. (French)

2A. **Implementing a Farming Systems Research Program: A Case Study in Haiti**, CRDA/FAMV, ADS-II, Swanson and Dupont, June 1984. (French,English)

2B. **Emploi de Nouvelles Cultures par le Projet ADS-II**, Richard Swanson, CRDA/FAMV, ADS-II, novembre 1984, (French).

3. **Introduction of a Technological Package for Rice in the Zone of Les Cayes**, CRDA/FAMV, ADS-II, Amal Chatterjee, December 1985.

4. **Le Role des stations recherche experimentale dans la recherche et vulgarisation des systemes de production**, CRDA/FAMV, ADS-II, Amal Chatterjee, June 1984. (French,English)

5. **Les Grandes lignes du volet vulgarisation Agricole du Projet ADS-II**, FAMV/CRDA, ADS-II, Joseph N. Pierre, June 1984. (French,English)

6. **Seminaire sur les Systemes de Production Agricole en Haiti**, Papers presented at June 25-28 workshop in Limbé, Haiti, FAMV/Marndr, ADS-II, September 1984. (French)

7. **ADS-II 1984 Rapport Annual**. (French)

8. **Assessing of Requirements for Designing and Implementing a National Agricultural Survey in Haiti**, M. Cuevas,D. Megill, January 1985. (English)

9. **Assessment of Requirements for Designing and Implementing a Pilot Area Frame Survey in Haiti**, R. Albert, February 1985. (English)

10. **Experimental and Survey Design and Analysis Needs for Farming and Information Systems Component of ADS-II Project, Haiti**, Doug Neeley, January 1985. (English)

11. **Construction of Area Sampling Frame, for Haiti, Department du Sud**, Paul Blackwood, April 1985. (English)

12. **Methode de sèlection intervariètale et systèmes de cultures associèes, Haut Cap Rouge, Jacmel**, CRDA/FAMV, S.Jacques, May 1985. (French)

13. **Frame Verification and Sampling**, Blackwood,Davies, June 1985. (English)

14. **ADS-II 1985 Annual Report**. (French,English)

15. **Preliminary Results of Pilot Agricultural Survey in the Department of the South, Haiti**, Bertelsen, Dupont, and Swanson, ADS-II, March 1986 (English, French)

16. **Inventory of Principal Watersheds of Haiti, CRIES**, Bertelsen and Swanson, ADS-II, March 1986 (French, English).

17. **Initial Digital Resource Data Base for Haiti**, ADS-II/MARNDR in cooperation with CRIES Project, Michigan State University, April, 1986. (English)

18. **Informatique et Statistiques Agricoles, Synthèse des travaux rèalisès, Presentation du Logicial CRIES**, ADS-II, Andrè Toussaint, March 1986. (French)

19. **Elaboration de Comptes d'Exploitation Agricole: Les Coopèrants du Bassin-Versant Morija, Haut Cap Rouge, Jacmel** Pognon, Chopak, et Swanson, avril 1986. (French)

20. **La Diffusion des Innovations Agricoles de l'ADS-II**, CRDA/FAMV, ADS-II, Yves-Francois Pierre, septembre 1985. (French)

21. **The Pilot Agricultural Survey in the Department du Sud: Methodology and Conclusions**, Bertelsen, Dupont, and Swanson, ADS-II/MARNDR, August 1986. (English,French)

22. **Results of the Pilot Agricultural Survey in the Department du Sud: Second Agricultural Season 1985**, Bertelsen, Dupont, Jean-Baptiste, Swanson, ADS-II/MARNDR, August 1986. (English, French)

23. **Agricultural Research and Extension Linkages in Haiti: A Pragmatic FSR/E Approach**, Swanson, Bertelsen, Hilaire, ADS-II/MARNDR, October 1986. (English, French)

24. **Preliminary Results of the Second Agricultural Survey in the Department Du Sud, Haiti, - First Agricultural Season (February - July 1986)**, ADS-II/MARNDR, December 1986. (English, French)

25. **Atlas Statistique du District Agricole LES CAYES**, Doug Brown, ADS-II/MARNDR, Mars 1987. (French)

26. **Agricultural Statistics for the Department du Sud, Year 1985-1986: Second Season 1985 - First Season, 1986**, ADS-II/ MARNDR, April 1987.

27. **A Geographical Atlas of the Department du Sud: Comparison of Strata for the National Agricultural Survey**, Bertelsen Mcguire, and Brown, ADS-II/MARNDR, April 1987.

28. **Yield Estimates for Eight Crops in the Department du Sud, Haiti: An Interpretation of Results from the Agricultural Survey**, Bertelsen and Swanson, ADS-II/MARNDR, April 1987.

29. **Final Report, Land Cover/Use Mapping: Region du Sud, Haiti**, Michigan State University/ADS-II/MARNDR, March 1987. (English).

30. **The Value of Information From a National Agricultural Survey: Inferences from Extension of FSR/E Recommended Practices in Haiti**, Bertelsen, Swanson, and Grafton, October, 1987 (English).

31. **Preliminary Results for National Survey Statistics in 4 Departments of Haiti**, ADS-II/MARNDR, May 1987 (English).

32. **The Raising of Pigs Before and after PEPADEP**, (Les Cayes Report) Grafton, Pognon, and Levelt, ADS-II/MARNDR, June 1987. (English, French)

33. **Bilan d'Une Annèe d'Activitès du Projet ADS-II, 1986**, ADS-II/MARNDR, Mars 1987. (French)

34. **An Improved Sampling Scheme for Estimating the Area and Yield of Sugar Cane in Haiti**, Marshall Ashley, ADS-II/MARNDR, April 1987. (English)

35. **Geographically Referenced Crop Trial Records: A Case Study**, Brown, Bertelsen, and Chatterjee, ADS-II/MARNDR, October, 1987 (English).

36. **How Can Small Farmers Increase their Maize Yield in Haiti**, Joseph N. Pierre, ADS-II/MARNDR, October 1987 (English).

37. **Geographically Referenced Watershed Systems Research: A Socio-economic Application in Haiti**, Swanson et. al., ADS-II/MARNDR, October 1987 (English).

38. **A Study to Improve the Accuracy of the Haitian Annual National Survey for Coffee Production**, Marshal Ashley, ADS-II/MARNDR, June 1987. (English).

39. **ADS-II 1986 Annual Report**. (French/English)(Supplement to Report # 33.

40. **Study on the Costs of Production of Principal Crops in the Les Cayes Region of Haiti**, Quenton Grafton, R. Levelt, A. Chatterjee, July, 1987. (English, French)

41. **Liste des Departements et des Sections Communales de la Republique d'Haiti**, Prepared by the Geographic Information Systems/Landsat Division, September 1987. (French).

42. **Comparison of Traditional FSR/E Introduced Practices for Harvesting and Threshing Rice**, Quenton Grafton, October, 1987. (English).

43. **Study on the Adoption of ADS-II Farming Systems Innovations**, Quentin Grafton, E. Walters, R. Levelt, H.Pognon, November, 1987. (English)

44. **Assessement of ADS-II Soil Conservation Strategies at Fonds-des-Freres, Les Cayes Region**, Grafton, Chatterjee, Dupiton, Swanson, November, 1987. (English).

45. **Status Report on the Digital Resource Data Base**, GIS/Landsat Unit, ADS-II Project, December, 1987. (French).

46. **Statistical Theory for Farming Systems Agronomic Research**, Quenton Grafton, October, 1987. (French).

47. **An Evaluation of a FSR/E Project: Costs and Benefits of Research and Extension**, Grafton, Swanson, Bertelsen, Walters, December, 1987.

48. **Nutrition as a Part of Farming Systems Research: Food Consumption Profile of Haut Cap Rouge, Haiti**, Cynthia Bertelsen, December 1987.

49. Jacmel Soil Conservation Study, Swanson, O'Reilly, Merisier

50. **Rice and Sorghum Applied Research**, Amal Chatterjee, October 1987.

51. **Suivi de l'Introduction de l'Elevage de Lapins dans le Systeme de Production Paysanne**, Robert Levelt, November 1987.

52. Socio-economic Household Labor Time Study/Market Data, Grafton and Walters, Les Cayes.

53. Socio-economic Household Labor Time Study/Market Data, Swanson, O'Reilly, Denis, Jacmel.

54. **Study on the Raising of PIgs in Traditional Systems**, Robert Levelt, Quenton Grafton, December 1987.

55. **ADS-II Market Price Summaries in Jacmel and Les Cayes**, Richard Swanson, Quenton Grafton, Levelt, Denis, O'Reilly, December 1987.

56. Jacmel Pepadep Study, Swanson, Denis, O'Reilly, George

57. **ADS-II Contract # 521-0092 Terminal Report**, January 1988.

OTHER RELATED DOCUMENTS OF PROJECT IMPORTANCE

The Relationship between the Area Frame and CRIES Projects, Michigan State University, Ger Schultink, 1981.

User's Guide to the CRIES Geographic Information System, Michigan State University, Schultink et. al.,1985.

Preliminary Workplan for the Implementation of the Comprehensive Resource Inventory and Evaluation System (CRIES) Project in the Republic of Haiti, Port-au-Prince, Haiti, Ger Schultink, June 1984. (English)

Agricultural Development Support II. Midterm Evaluation, Uli Locher et al., May 1986.

Appendix I:

ADS-II PERSONNEL
(As of January 31, 1988)

ADMINISTRATION, BUREAU CENTRALE, PORT-AU-PRINCE

	NOM ET PRENOM	TITRE	ZONE
01	BEAULIEU, Guy	Directeur Projet ADS-II	P-au-P
02	DUPONT, Ernest	Directeur Statistiques (SAN,SIG,IA)	P-au-P
03	CESAR, Martine D.	Dir. Adj. Informatique/Analyse (IA)	P-au-P
04	HYPPOLITE, Carlo	Dir. Adj. Systeme d'Information Geographique (SIG)	P-au-P
05	DESRUISSEAUX, Gasparc	Dir. Adj. Statistique Agricole National (SAN)	P-au-P

DIVISION INFORMATIQUE/ANALYSE (I.A.)

Equipe informatique/analyse

06	POGNON, Sonia	Superviseur Entree Donnees	P-au-P
07	ELIE, Maud	Operatrice Adj.,Verificateur	P-au-P
08	Monique Antoine	Operatrices donnees	P-au-P
09	Florence Guerrier	Operatrices donnees	P-au-P
10	Lunie Jason	Operatrices donnees	P-au-P
11	Margaline Glemaud	Operatrices donnees	P-au-P
12	Huguette Lafortune	Operatrices donnees	P-au-P
13	Margareth Lamothe	Operatrices donnees	P-au-P
14	Lamercy Latrie	Operatrices donnees	P-au-P
15	Emeline Clement	Assistante operatrice, data clerk	P-au-P

DIVISION SIG/LANDSAT

Equipe Systeme d'Information Geographiquie

16	SIMON, M. France	Analyst Informatique SIG	P-au-P
17	CADET, Mona	Superviseur Digitalisation SIG	P-au-P
18	Chery Ducne	Digitalisateur	P-au-P
19	Arold Guillaume	Digitalisateur	P-au-P

Equipe Landsat

20	Jn. Elie Prosper	Techn. Cartographie	P-au-P

Equipe Administrative/Support

21	HERISSE, Genevieve	Adjoint-Administratif	P-au-P
22	ALLEN, Linda	Comptable	P-au-P
23	HENRY, Nadine D.	Secr. de Direction	P-au-P
24	GARNIER, Gladys	Secr. Bilingue	P-au-P
25	AUGUSTIN, J.Wilson	Chauffeur	P-au-P
26	RIVIERE, Tony	Chauffeur	P-au-P
27	JEAN J. Fils	Chauffeur	P-au-P
28	PELISSIER, Moise	Messager	P-au-P

DIVISION ENQUETE NATIONALE

29	MERVIL, Osner	Statisticien (Analyst)	P-au-P
30	MENTOR, Rudy	Statisticien (Analyst)	P-au-P
31	VALERE, Jn.Marie	Aide-Statisticien	P-au-P

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Total ADS-II Central Office Professional/Support Staff: 31
(includes GIS, data entry and analysis personnel)

STATISTIQUE AGRICOLE NATIONAL (SAN)
Equipe du Terrain

SUD

1	DIMANCHE, Jean-Claude	Superviseur Regional	Region de Sud
2	JEAN-BAPTISTE, Laveaux	Superviseur Departemental	Departement du Sud
3	PERRIN, Pierre Arnel	Superviseur Departemental Adjoint	Departement du Sud
4	GLEMAUD, Faubert	Sous-Superviseurs	Les Cayes
5	HONORE, Jean-Elie	Sous-Superviseurs	Baradere
6	ODRICE, Exina	Sous-Superviseurs	Aquin
	31 personnels	Enumerateurs	Departement du Sud
	20 aides	Guides	Departement du Sud
7	JEAN-PHILIPPE, Luc	Superviseur Departemental	Departement de la Grande-Anse
8	LUCAS, Maxo	Superviseur Departemental Adjoint	Departement de la Grande-Anse
9	SCIPION, Hebert	Sous-Superviseurs	Jeremie
10	JOSEPH, Milo	Sous-Superviseurs	Miragoane
	19 personnels	Enumerateurs	Departement de la Grande-Anse
	6 aides	Guides	Departement de la Grande-Anse

OUEST

11	DORISSANT, Louis-Gabriel	Superviseur Regional	Region de l'Ouest
12	DENIS, Jean-Mardy	Superviseur Departemental	Departement de l'Ouest
13	RACINE, Jean-Lionel	Superviseur Departemental Adjoint	Departement de l'Ouest
14	NORMIL, Jean	Sous-Superviseurs	La Gonave
15	HYPPOLITE, Joel	Sous-Superviseurs	Petit Goave
16	LARDOX, Jean Robert	Sous-Superviseurs	Port-Au-Prince
	35 personnels	Enumerateurs	Departement de l'Ouest
	16 aides	Guides	Departement de l'Ouest
17	FRANCOIS, Georges	Superviseur Departemental	Departement du Sud-Est
18	DELPECHE, Fritz	Superviseur Departemental Adjoint	Departement du Sud-Est
19	AGELLA, Macule	Sous-Superviseurs	Bainet
20	ANDRE, Senatus	Sous-Superviseurs	Jacmel
21	CAZEAU, Frantz	Sous-Superviseurs	Thiotte
	35 personnels	Enumerateurs	Departement du Sud-Est
	10 aides	Guides	Departement du Sud-Est

NORD

22	JEAN-BAPTISTE, Arrod	Superviseur Regional	Region du Nord
23	ANTOINE, Jean-Robert	Superviseur Departemental	Departement du Nord
24	JEAN-BAPTISTE, Abdias	Superviseur Departemental Adjoint	Departement du Nord
25	BELONY, Luc	Sous-Superviseurs	St. Raphael
26	LACROIX, Mathieu	Sous-Superviseurs	Plaisance
	43 personnels	Enumerateurs	Departement du Nord
	10 aides	Guides	Departement du Nord

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27	JEAN-BAPTISTE, Jacques	Superviseur Departemental	Departement du Nord-Est
28	PIERRE, Fred	Superviseur Departemental Adjoint	Departement du Nord-Est
29	AUGUSTIN, Noe	Sous-Superviseurs	Trou-du-Nord
30	PIERRE, Eliphete	Sous-Superviseurs	Ouanaminthe
	31 personnels	Enumerateurs	Departement du Nord-Est
	10 aides	Guides	Departement du Nord-Est

31	JOSEPH, Henry D.	Superviseur Departemental	Departement du Nord-Ouest
32	TERNELAN, Michelet	Superviseur Departemental Adjoint	Departement du Nord-Ouest
33	DEUS, Delano	Sous-Superviseurs	St. Louis du Nord
34	JEAN-GILLES, Diogene	Sous-Superviseurs	Jean-Rabel
	34 personnels	Enumerateurs	Departement du Nord-Ouest
	10 aides	Guides	Departement du Nord-Ouest

TRANSVERSALE

35	FORTUNAT, Eddy	Superviseur Regional	Region de la Transversale
36	CANGE, Diogene	Superviseur Departemental	Departement de l'Artibonite
37	AUGUSTE, Colbert	Superviseur Departemental Adjoint	Departement de l'Artibonite
38	FRANCOIS, Jean-Claude	Sous-Superviseurs	Haut Artibonite
39	SAINTEREST, Israel	Sous-Superviseurs	Bas Artibonite
	24 personnels	Enumerateurs	Departement du Nord-Ouest
	5 aides	Guides	Departement du Nord-Ouest

40	AUGUSTIN, Jean-Claude	Superviseur Departemental	Departement du Centre
41	FRANCOIS, Monestine	Superviseur Departemental Adjoint	Departement du Centre
42	LEVEILLARD, St. Claire	Sous-Superviseurs	Bas Plateau
43	JULIO, Jules	Sous-Superviseurs	Haut Plateau
	29 personnels	Enumerateurs	Departement du Centre
	8 aides	Guides	Departement du Centre
44	PIERRE, Fred	Chauffeur (SAN)	P-au-P

Total SAN Field Personnel: 43 Full Time Supervisors
284 Temporary Enumerators and 95 Temp.Guides

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RECHERCHES APPLIQUEES DES SYSTEMES DE PRODUCTION
Equipe Systemes de Production: JACMEL

1	JEAN, Wilfried	Coordonnateur	Jacmel
2	POGNON, Hodolphe	Economist rural	Jacmel
3	DENIS, Joseph	Agronome de site, BCR, (Econ.Rur.)	Jacmel
4	MERISIER, J. Rony	Agronome de site, Haut Cap Rouge	Jacmel
5	GEORGES, Parnell	Agronome (elevage)	Jacmel
6	LAINE, Manes	Agronome resident	Jacmel
7	JEAN, Ivvy	Agronome resident	Jacmel
8	BAZELAIS, Jouhain Mentor	Agronome resident	Jacmel
9	CHERUBIN, Marie Carole	Agronome resident	Jacmel

10	SAINT-FORT J. Jorel	Superviseur/Moniteur	Jacmel
11	LOUISE, Anna	Superviseur/Moniteur	Jacmel
12	JACQUES, Bernard	Moniteur	Jacmel
13	JEAN-FRANCOIS, Rachelle	Moniteur	Jacmel
14	FERREAUD, M. Phanuel	Moniteur	Jacmel
15	TOUSSAINT, Erick	Moniteur	Jacmel
16	THOMAS, Pierre	Moniteur	Jacmel
17	MEDE, J.A. Formule	Moniteur	Jacmel
18	ANDRAL, Gary	Moniteur	Jacmel
19	ETIENNE, Joab	Moniteur	Jacmel
20	AZOR J. Baptiste	Moniteur	Jacmel
21	AVRIL, Andreville	Moniteur	Jacmel
22	JEANTY Verto	Moniteur	Jacmel
23	MAXI, Vilciner	Moniteur	Jacmel
24	FERREAUD, Ghislaine	Secr./JACMEL	Jacmel
25	GARRAUD, Paul	Chauffeur	Jacmel
26	JOSEPH, Evelyne	Tech.Agro. Supervis. Moniteur	Jacmel
27	SALNAME, Jean-Marie	Tech.Agro. Supervis. Moniteur	Jacmel

Equipe Systemes de Production: LES CAYES

1	EDME, Serge	Coordonnateur	Cayes
2	POSNON, Hodolphe	Economiste	Cayes
3	VALBRUN, Jean	Agronome de site, Berault	Cayes
4	PAUL, J.C. Duciton	Agronome de site, Maniche (Conserv. des Sols)	Cayes
5	ROBERT, S. Levelt	Agronome (Economie Rurale)	Cayes
6	CELOSE, Henry	Agronome resident	Cayes
7	EUSTACHE, Jean-Orel	Agronome resident	Cayes
8	VVER-GEORGE, Jn.Francois	Agronome resident	Cayes
9	LUCIEN, Jean-Kenault	Agronome resident	Cayes
10	MASSEUS, Restal	Moniteur	Cayes
11	NOZE, Andre	Moniteur	Cayes
12	DUMONT Gerard	Moniteur	Cayes
13	BERLUS, Osnel	Moniteur	Cayes
14	POLDOR, Justin	Moniteur	Cayes
15	LOUIS-JEAN, J.Briere	Moniteur	Cayes
16	POINT DU JOUR, Yves	Moniteur	Cayes
17	DOLE Christiome	Moniteur	Cayes
18	BARTHOLD, Claudomir	Moniteur	Cayes
19	LIMA, Phanor	Moniteur	Cayes
20	JEAN-BAPTISTE, Jules	Moniteur	Cayes
21	JEAN-BAPTISTE, Lissa	Moniteur	Cayes
22	LOUIS, Seance	Moniteur	Cayes
23	MANADE, Phegnor	Moniteur	Cayes
24	PHILEMON, Dieula	Moniteur	Cayes
25	BERNABE, Varnie	Secr./CAYES	Cayes
26	DELERME Jn. Marie	Chauffeur	Cayes
27	Decimus, Yves	Gardien, Bur.Les Cayes	Cayes

Total Central Office Staff: 31
Total National Ag. Survey Field Staff: Full Time: 43
Part Time: 360 + 190
Total Farming Systems Jacmel Staff: 27
Total Farming Systems Les Cayes Staff: 27

Total Full Time PDS-II Staff (as of Jan.31, 1988): 128 Full Time
360 part time

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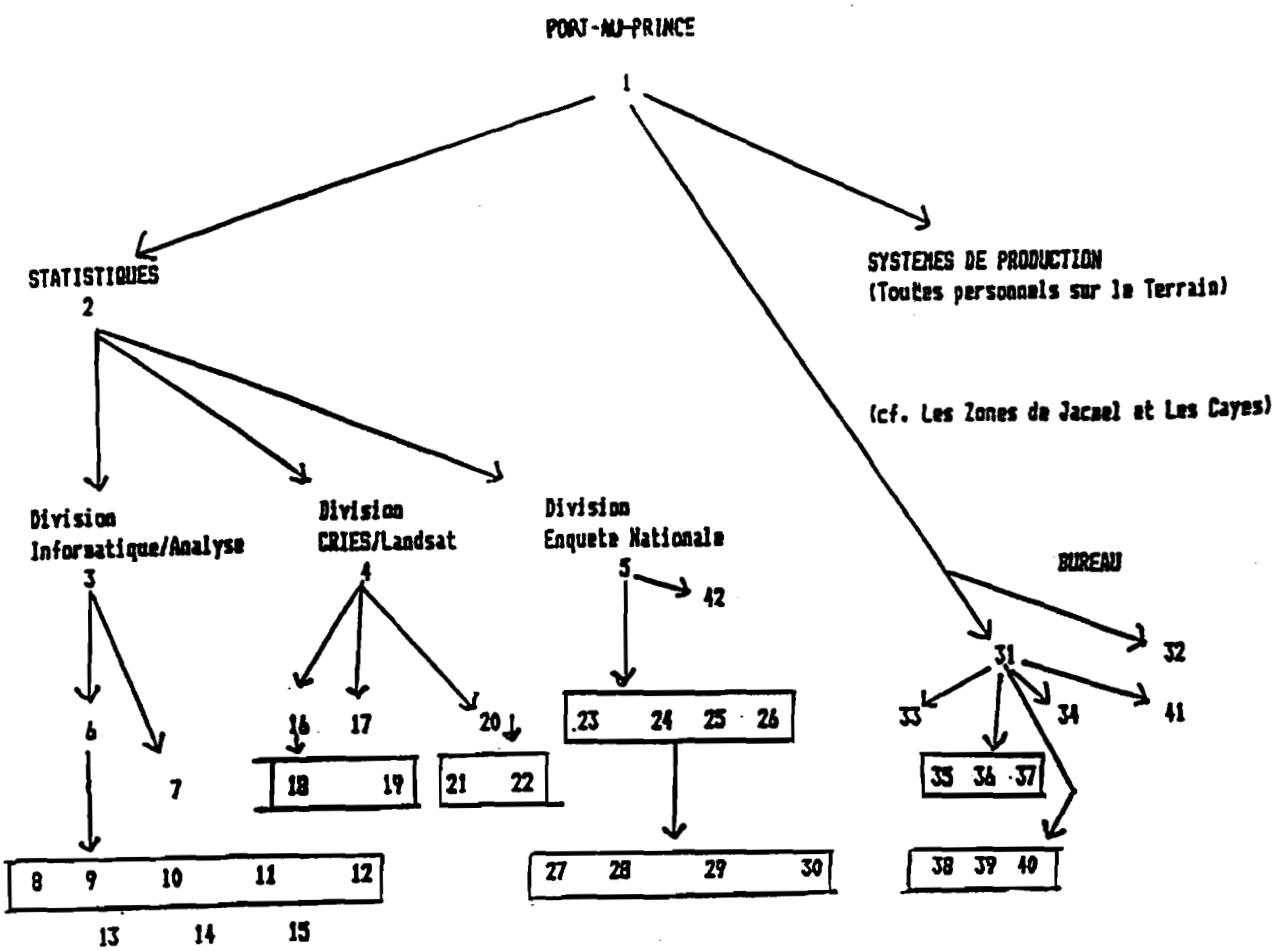
STRUCTURE TECHNIQUE ET ADMINISTRATIVE ACTUELLE DE ADS II



1 à 5	Directeur et Directeurs Adjoints
6 à 15	Informatique
16 à 22	CRIES/LANDSAT
23 à 30	Enquête Nationale
31 à 41	Support Administratif

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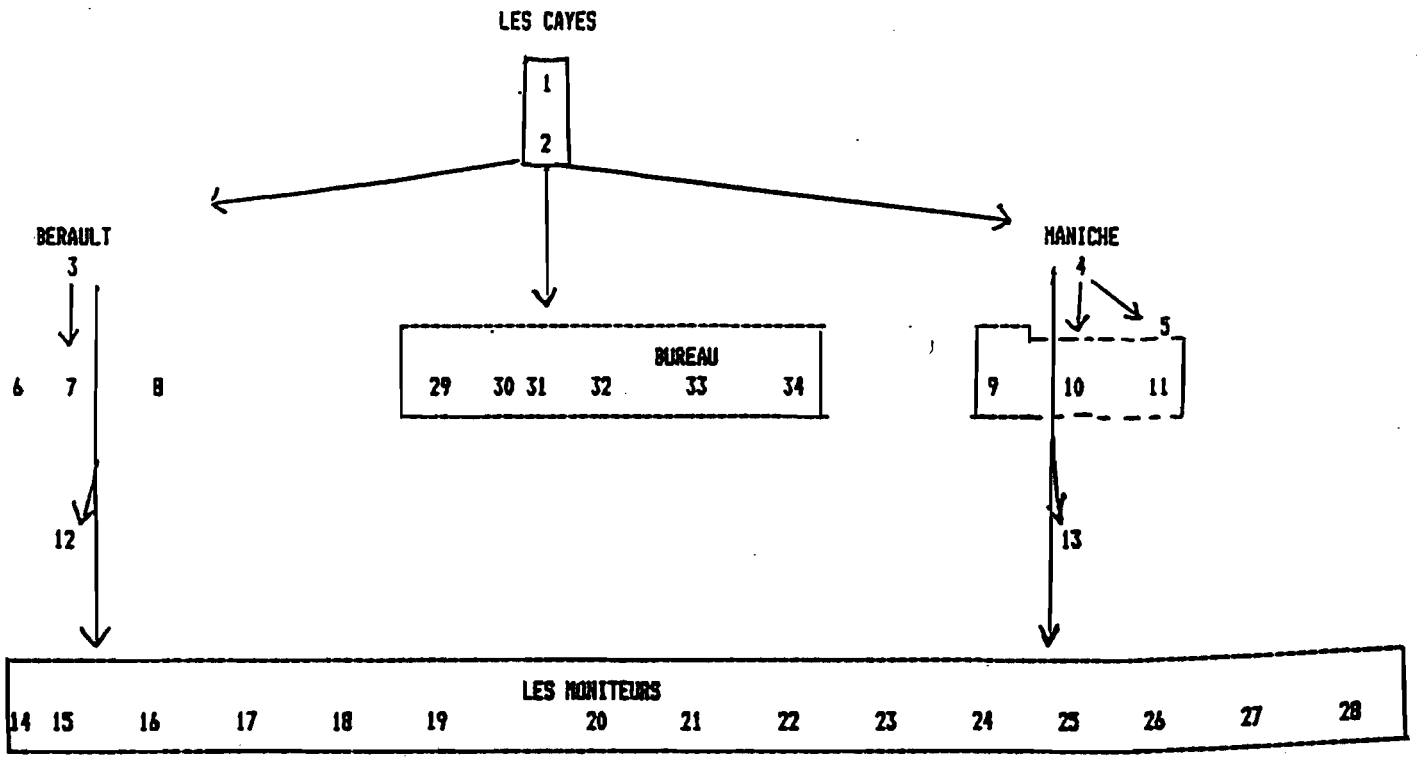
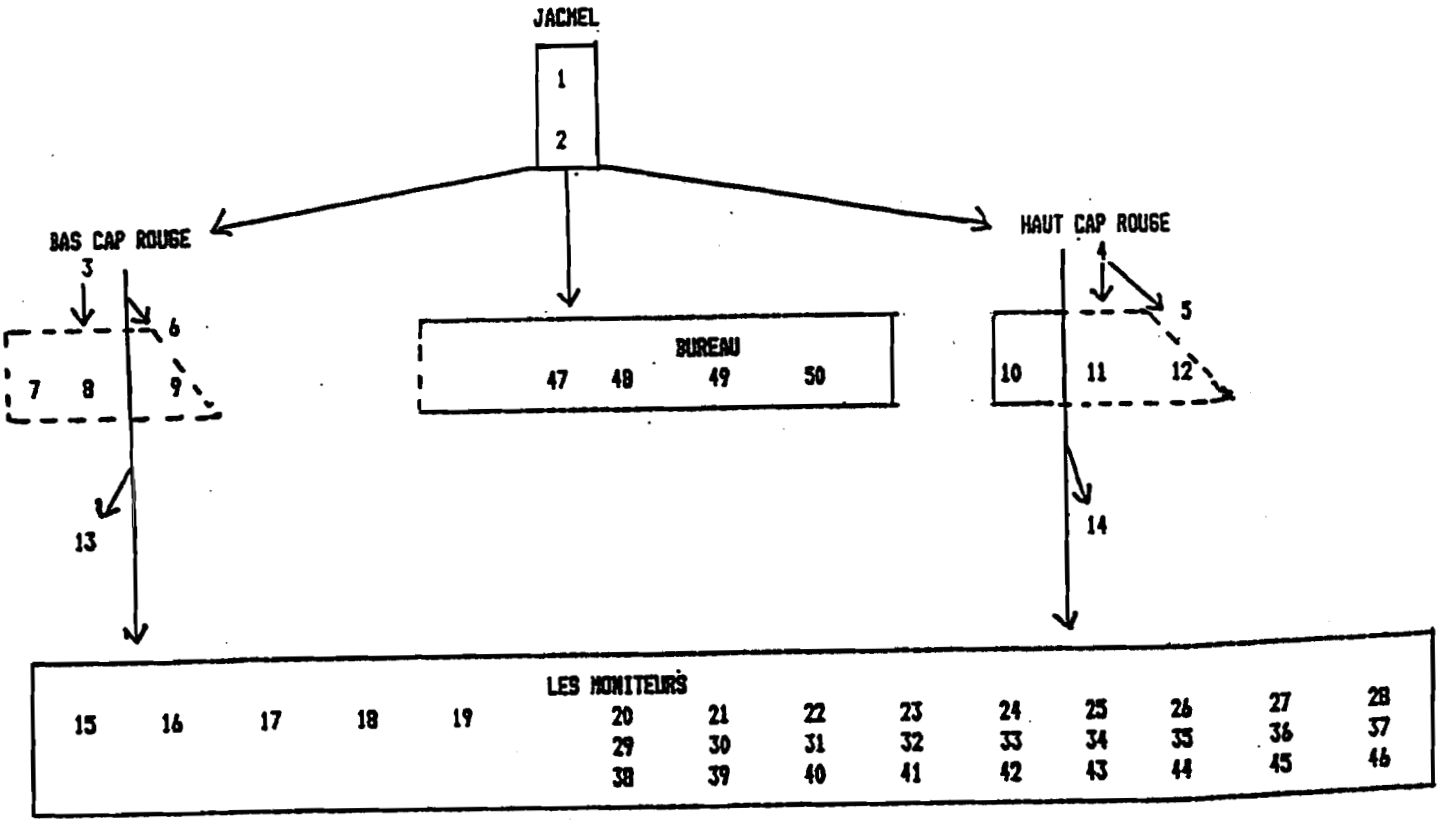


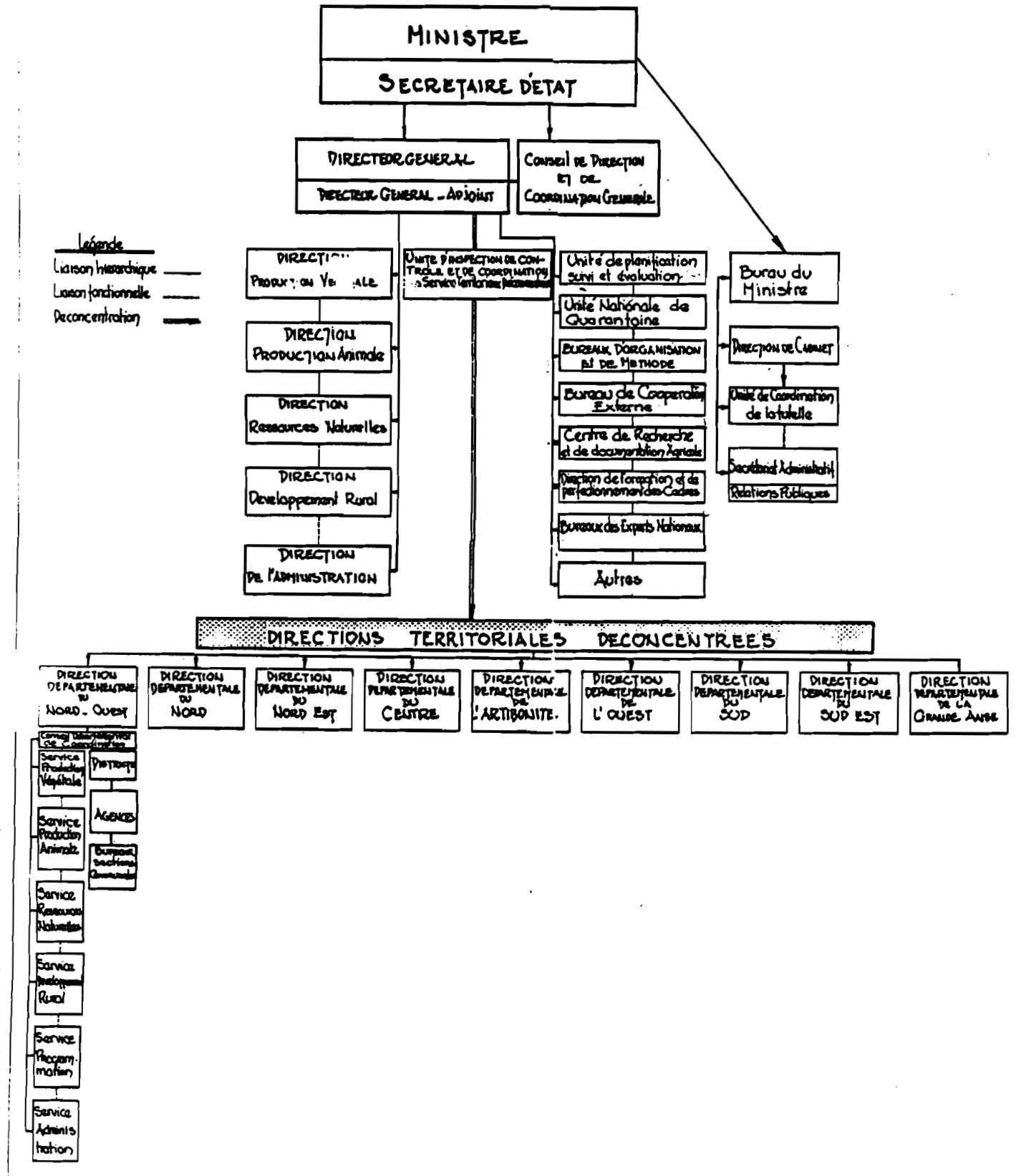
1 - 2	Coordonnateur - Economiste
3-4-5	Agronomes de site
6 à 11	Agronomes Résidents
12-13	Superviseurs-moniteurs
14 à 28	Moniteurs
29 à 34	Administration



1 - 2	Coordonnateur - Economiste
3 à 6	Agronomes de site
7 à 12	Agronomes résidents
13-14	Superviseurs - moniteurs
15 à 46	Moniteurs
47 à 50	Administration

MINISTERE DE L'AGRICULTURE DES RESSOURCES NATURELLES ET DU DEVELOPPEMENT RURAL (MARNDR)

(DECRET DU . . . 198)



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