

PJHAR 6-50

TITLE XII AGRICULTURE DEVELOPMENT SUPPORT PROGRAM

(279-0052)

YEMEN ARAB REPUBLIC

FACULTY OF AGRICULTURE

SUBPROJECT PAPER

Final Revision
11/08/84

TITLE XII AGRICULTURAL DEVELOPMENT SUPPORT PROGRAM

(279-0052)

YEMEN ARAB REPUBLIC

FACULTY OF AGRICULTURE

SUBPROJECT PAPER

Final Revision
11/08/84

2

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number

DOCUMENT

CODE

3

2. COUNTRY/ENTITY

Yemen Arab Republic

3. PROJECT NUMBER

279-0052

4. BUREAU/OFFICE

USAID/Yemen

279

5. PROJECT TITLE (maximum 40 characters)

Agriculture Development Support

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
1 2 3 1 9 5

7. ESTIMATED DATE OF OBLIGATION

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

A. Initial FY 7 9

B. Quarter

C. Final FY 9 4

8. COSTS (\$000 OR EQUIVALENT \$1 =)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	1,200		1,200	82,318		82,318
(Grant)	(1,200)	()	(1,200)	(82,318)	()	(82,318)
(Loan)	()	()	()	()	()	()
Other U.S.	1.					
	2.					
Host Country					42,039	42,039
Other Donor(s)					25,906	35,906
TOTALS					67,945	150,263

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) FN	000			45,179		29,187		82,318	
(2)									
(3)									
(4)									
TOTALS				45,179		29,187		82,318	

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

300 600 700 960

11. SECONDARY PURPOSE CODES

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

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

The purpose of the overall Agriculture Development Support Project and its subprojects, is to improve the capacity of the YARG and Yemeni agricultural producers to develop and sustain an agricultural sector which effectively and efficiently uses Yemen's natural resources, is integrated into the economy and is supportive of a broad-based and equitable social and economic development.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify) 935

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

17. APPROVED BY

Signature

Charles F. Weden, Jr.

Title

Director
USAID/Sanaa

Date Signed

MM DD YY

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

MM DD YY

1 11 2016 8 7 4

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number
N/A

DOCUMENT
CODE

3

2. COUNTRY/ENTITY

Yemen Arab Republic

4. BUREAU/OFFICE

USAID/Sanaa

279

3. PROJECT NUMBER

279-0052

5. PROJECT TITLE (maximum 40 characters)

Agriculture Development Support
Faculty of Agriculture Subproject

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
1 | 2 | 3 | 1 | 9 | 5

7. ESTIMATED DATE OF OBLIGATION
(Under "B" below, enter 1, 2, 3, or 4)

A. Initial FY 8 | 5 | B. Quarter C. Final FY 9 | 4 |

8. COSTS (\$000 OR EQUIVALENT \$1 =)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	754	1,246	2,000	29,187		29,187
(Grant)	(754)	(1,246)	(2,000)	(29,187)	()	(29,187)
(Loan)	()	()	()	()	()	()
Other U.S.						
1.						
2.						
Host Country		12,400			31,582	31,582
Other Donor(s)					25,906	25,906
TOTALS	754	13,646	2,000	29,187	57,488	86,675

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) FY	070			- 0 -	- 0 -	29,187	- 0 -	29,187	- 0 -
(2)									
(3)									
(4)									
TOTALS						29,187		29,187	

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

350 600 700 960

11. SECONDARY PURPOSE CODE

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

A. Code XII TNG
B. Amount ALL. ALL.

13. PROJECT PURPOSE (maximum 480 characters)

To support the establishment within the University of Sanaa of Yemen's first Faculty of Agriculture which will be responsive to the YAR's agricultural development needs, will be supportive of private and public sector development, and will have appropriate linkages to the agriculture sector's production and institutional structure.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
 0 | 3 | 8 | 7 | 0 | 3 | 8 | 9 | 0 | 9 | 9 | 5 |

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify) 935

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

N/A

17. APPROVED BY

Signature: Charles F. Weden, Jr.

Title: Director
USAID/Sanaa

Date Signed: MM DD YY
 | | | |

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

MM DD YY
1 | 1 | 2 | 16 | 8 | 4 |



AGENCY for INTERNATIONAL DEVELOPMENT
UNITED STATES AID MISSION TO YEMEN ARAB REPUBLIC

الولايات المتحدة الأمريكية بعثة وكالة التنمية الدولية الى الجمهورية العربية اليمن

USA Address
SANA'A (I.D.)
Department Of State
Washington, D.C. 20520

International address:
USAID
P. O. Box 1139
Sanaa, Y. A. R.

1139
مركز
بناية - اليمن

November 8, 1984

Mrs. W. Antoinette Ford
Assistant Administrator
Bureau for the Near East
Agency for International Development
Washington, D.C. 20523

Dear Toni:

Enclosed for final AID/W review and authorization is the revised Faculty of Agriculture Subproject Paper (SPP) for initiation of this planned new subproject under the Agricultural Development Support program. An earlier version of this SPP was reviewed by the NEAC on March 9, 1984, and approved subject to our making revisions in response to issues raised by the NEAC. (See NEAC reporting cable State 106637, dated April 11, 1984.) I believe you will find that the NEAC issues have been adequately addressed in the attached document.

As you know, I have over the past several months talked to a number of people in AID/W about whether AID would be prepared to pick up a significant portion of the Faculty of Agriculture construction costs if the YARG were unable to locate another donor. The issue of who will pay for construction costs has been unresolved since this subproject was first conceived, and one of the reasons the design process has taken a long time was that at various steps along the way we were waiting for some indication that construction financing had been secured. This has not yet happened. The YARG is planning to pursue the possibility of co-financing with the Saudi Fund in bilateral discussions in November. In addition we understand that the Islamic Bank may be interested in providing some or all the required funding. Frankly, however, we are not sanguine that these possibilities will result in a signed assistance agreement in the short-term, i.e. in the next several months.

5

Recognizing this possibility, the YARG indicated in a letter last January that they would be prepared to finance construction from their own resources if another donor were not found.

Given these uncertainties, the enclosed SPP continues to posit that construction financing will eventually become available, whether from another donor, the U.S., or from the YARG's own resources. We believe that the project described in the SPP would be a valuable contribution to the YARG's agricultural institution building efforts under any circumstances, but that given recent initiatives by the YARG it is essential that implementation of some portions of the SPP begin immediately, irrespective of the status of the construction financing issue. The SPP was originally developed on the assumption that students could initially be admitted to the Faculty of Agriculture in the fall of 1986, and that during the 1986-87 academic year this first class would use the facilities of the Faculty of Science until completion of the FOA buildings by the fall of 1987. The YARG, in its eagerness to initiate this new Faculty, has undertaken to move up this planned schedule, in spite of the fact that even if construction were initiated immediately, the new Faculty buildings could not now be completed until the fall of 1988. Here are the steps the YARG has already taken:

- Opened the Faculty of Agriculture in September with 25 students chosen from among 50-60 qualified applicants.
- Established a minimum entrance requirement of a secondary school grade point average of 70. This minimum requirement, in comparison with the Faculty of Science's 55 minimum, should ensure that the new FOA enrolls some of the more highly qualified students at Sana'a University.
- Made arrangements for the entering class to use the facilities of the Faculty of Science for their first year. The FOA was limited to 25 first year students because of the lack of space in the Faculty of Science.
- Identified a 380 students teacher training facility on the main University campus to serve as a temporary facility until completion of the FOA permanent facilities. University officials expect that this temporary facility will be made available as early as January, 1985 to allow time for preparing the building for FOA occupancy in fall, 1985. We have looked at the facility and believe that it will be adequate as a temporary facility.

- Designated an Acting Dean and a Deputy Dean for the Faculty, and recruited two other professors. University officials expressed a desire that A.I.D. provide an academic coordinator immediately and faculty to teach agriculture mechanics, plane surveying, range management and animal science next fall. All other subjects will be taught by Yemeni faculty already located.
- Made available funding for current FoA positions and for drilling a well for the planned instructional farm. These amounts are part of a 27 million YR budget allocation (Dols 4.7 million) which the University had offered to make as a contribution to FoA construction and operating expenses if AID were prepared to make a substantial funding commitment during FY 1984. Given our plans for initiation of this SP in FY 1985, and the continuing search for another donor for construction financing we were unable to be as forthcoming as the University would have liked, and as a result a large portion of this YARG calendar year 1984 funding had to revert to the new Faculty of Engineering instead.

With all these important steps in process, it is clear that the YARG considers early initiation of a FoA to be of a high priority. It is equally clear that the YARG intends there be a Faculty of Agriculture, irrespective of the extent or timing of USAID involvement. In light of these circumstances, we have concluded that it would be unwise for us totally to withhold our assistance under this subproject pending resolution of the construction financing issue. However, we do want to encourage the YARG to continue to seek financing for the new buildings from other donors, and to allow ourselves time to see how this effort plays itself out before we make any commitment for U.S. financing of construction costs. Accordingly, we propose the following scenario for AID/W consideration in approving and authorizing this subproject:

- The full Dols 29.2 million technical assistance subproject described in the attached SPP would be authorized immediately.
- In executing this authorization it would be understood that the Dols 29.2 million will be broken into two obligation and implementation phases, with the first phase to begin upon authorization, and the second phase to remain contingent upon a firm funding commitment for the office/classroom buildings. A detailed breakdown of the subproject budget between phase one and phase two is attached.

- Commencing with authorization, phase one would include design of the teaching farm, training of Yemeni faculty, provision of expatriate faculty until Yemeni staff is in place, limited laboratory equipment for temporary facilities later to be moved to the new buildings, an advisor to assist in establishing the Faculty of Agriculture in the temporary facilities, and limited funds for architectural and engineering services which would be advantageous (i.e. schematic design phase) prior to a firm commitment for construction funding. As shown in the attached budget, phase one would require approximately Dols 15.7 million.

- The second phase, which would be initiated only after a firm funding commitment is made for the Faculty buildings, would include funding of the farm building construction, equipment and staffing of the demonstration-teaching farm, additional technical assistance, completion of the design and construction supervision for the Faculty buildings, and purchase of equipment. This second phase would require approximately Dols 13.5 million.

- Under this proposal, we would obligate no more than Dols 15.7 million until such time as construction funding requirements are resolved. Needless to say, resolution of this issue could involve agreement by the Saudis or the Islamic Bank to provide the requisite funds, or a subsequent decision on our part to provide loan financing for a large portion of construction costs, probably in conjunction with P.L. 480 Title I local currency generation and agreement by the YARG to finance the balance from their own resources.

In summary, the new Faculty of Agriculture has already been initiated by the YARG, and it is clear that they are prepared to continue this institution in some manner, regardless of external assistance. We believe that delaying implementation of this technical assistance subproject could only work to the detriment of our interests in seeing the Faculty of Agriculture established and providing high quality academic training with strong ties to the U.S. land-grant university system. We therefore request that after the NE Bureau has completed its review of the attached SPP the project authorization be finalized and forwarded for the Administrator's authorization of this Dols 29.2 million subproject.

4

I hope we'll have a chance to further discuss the possibility of AID construction financing at the Mission Director's Conference next month.

Sincerely yours,


Charles F. Wøden, Jr.
Director

Attachment

Three Alternatives for Phased Implementation

ALTERNATIVE ONE

Phase 1 - \$ 15.7 million

Design of Farm
1 Faculty Advisor
4 T.C.N. Faculty
Limited teaching equipment
Participant Training
Schematic Design of Office
classroom buildings

Phase 2 - \$ 13.5 million

Farm equipment
Construction of farm buildings
Team leader
Farm manager
Librarian
Teaching/laboratory equipment
Design and construction super-
vision of office/classroom
building

ALTERNATIVE TWO

Phase 1 - \$ 19.3 million

Design of Farm
1 Faculty Advisor
4 T.C.N. Faculty
Limited teaching equipment
Participant Training
Schematic Design of office
classroom buildings
Farm irrigation system
Operation of farm-cropping
Farm Manager

Phase 2 - \$ 9.9 million

Farm equipment
Construction of farm buildings
Team leader
Librarian
Teaching/laboratory equipment
Design and construction super-
vision of office/classroom
building

ALTERNATIVE THREE

Phase 1 - \$ 21.3 million

Same as alternative two with the addition of the team leader (\$ 213,971 from local currency budget and \$ 1,559,910 from the dollar budget) and the farm equipment (\$ 234,825) to Phase 1 and reduction of the same from Phase 2.

Phase 2 - \$ 7.9 million

F O A Budget (dollars)

	Alternative I		Alternative II	
	Phase I	Phase II	Phase I	Phase II
	\$	\$	\$	\$
I Salaries & Wages	2,153,967	1,174,311	3,002,571	325,707
II Indirect Costs	343,530	1,166,195	385,358	1,124,367
III Allowances	861,350	713,425	1,181,081	393,694
IV Travel & Transportation	600,000	963,795	1,172,846	390,949
V Exp Equ. & Material	65,000	154,500	78,000	141,500
VI Non-Exp-Equ. & Material	425,000	626,000	450,000	571,000
VII Instructional Farm	- 0 -	464,100	93,000	371,100
VII Other Direct Costs	- 0 -	45,000	10,000	35,000
Subtotal	4,448,847	5,277,327	6,372,856	3,353,318
Contingency 5%	222,442	263,867	318,643	167,666
Subtotal	4,671,289	5,541,193	6,691,499	3,520,983
Inflation 8% (comp)	1,891,119	2,243,292	2,687,367	1,447,044
Subtotal	6,562,408	7,784,485	9,378,866	4,968,027
IX Participant Training	5,759,910	- 0 -	5,759,910	- 0 -
X A/E Constr. & Supervision	705,000	2,198,000	930,000	1,973,000
XI Core repayment	50,000	50,000	100,000	- 0 -
Total	13,077,318	10,032,485	16,168,776	6,941,027

F O A Budget (Local currency)

I Salaries & Wages	- 0 -	- 0 -	- 0 -	- 0 -
II Operations	246,675	986,700	493,350	740,025
III Travel & Per Diem	247,070	104,055	258,430	92,695
IV Training	154,000	- 0 -	154,000	- 0 -
V Exp. Equ. & Mat	81,000	32,000	81,000	32,000
VI Non-Exp. Equ. & Mat.	70,000	45,000	70,000	45,000
VII Other Direct Costs	60,000	362,000	120,000	302,000
Subtotal	858,745	1,529,755	1,176,780	1,211,720
Contingency 5%	42,937	76,488	58,830	60,595
Subtotal	901,682	1,606,243	1,235,619	1,272,306
Inflation 8% (Compd.)	393,805	701,520	539,651	555,674
Subtotal	1,295,487	2,307,763	1,775,270	1,827,980
VII Instructional Farm	1,170,300	996,920	1,170,300	996,920
Contingency 10%	106,390	90,630	117,030	79,990
Subtotal	1,276,690	1,087,550	1,287,330	1,076,910
Inflation 10% (Comp)	59,447	50,641	58,000	52,088
Total AID L.C. Budget	2,631,624	3,445,954	3,120,600	2,956,978
Total AID L.C. & \$ Budget	15,708,942	13,478,439	19,289,376	9,898,005
Total AID Budget: Phase I and II		29,187,381		29,187,381

Detail F O A \$ Budget Phase I (Alternative I)

	<u>Phase I</u>	<u>Phase II</u>
I	Salaries & Wages	
	1) A.) on Campus	573,750
	2) TDY	
	a.) Project Consultant	50,000
	b.) Grad- stud. superv.	267,960
	c.) Project Evaluation	118,800
	Total on Comp. Sal. & Wages	891,710
	B. off Campus	
	a.) Faculty Adv.	250,000
	b.) TCN Fac.	629,000
	Total off Campus Sal. & Wages	879,000
	C. Fringe Benefits	
	a.) On Campus (28.2%)	161,797
	b.) off Campus (28.2%)	70,000
	c.) off Campus TCN 24%	150,960
	Total Fringe Benefits	383,257
	Total Salaries & Wages	2,153,967
		1,174,311
II	Indirect Costs	
	a.) On Campus 30%	172,125
	b.) Off Campus 19.5%	171,405
	Total Indirect Costs	343,530
III	Allowances	
	M: SC.	750,000
		111,350
	Total Allowances	861,350
		713,425
IV	Travel & Transportation	
		600,000
		963,795
V	Exp Equ. & Material	
	on Campus	5,000
	off Campus	60,000
	Total Exp. Equ. & Material	65,000
		154,500

F O A \$ Budget (Alternative I)

	<u>Phase I</u>	<u>Phase II</u>
VI Non-Exp. Equ. & Material		
Teaching Material	57,000	
Teaching Equ.	100,000	
Office Equ.	100,000	
Vehicles	40,000	
Misc. Equipment	60,000	
Equ. for Crop Lab	68,000	
Total Non-Exp Equ. & Mat.	425,000	626,000
VII Instructional Farm	- 0 -	464,100
VIII Other Direct Costs	- 0 -	45,000
Subtotal	4,448,847	,448,847
Contingency 5%	222,442	263,867
Subtotal	4,671,289	5,541,193
Inflation 8% (Comp)	1,891,119	2,243,292
Subtotal	6,562,408	7,784,485
IX Participants	5,759,910	
X A/E Constr. & Supervision		
A/E farm design	236,000	
Schematic design & preliminaries	469,000	
Total A/E Constr. & Superv.	705,000	2,198,000
XI Core Repayment	50,000	50,000
Total AID \$ budget	13,077,318	10,032,485

Detailed F O A L.C. Budget - Alternative I

	<u>Phase I</u> <u>L.C.</u>	<u>Phase II</u> <u>L.C.</u>
I Salaries & Wages	- 0 -	
II Operations	246,675	986,700
III Travel and Per Diem		
a.) Domestic	3,000	7,750
b.) Intl.		
1) Dean	5,000	-
2) Grad Stud	72,500	-
3) Local Grad Adv.	72,500	-
4) Intern. Participants	5,000	-
Total Travel	158,000	7,750
Per Diem		
a.) Domestic	18,900	48,195
b.) Intl.		
1) Dean	2,880	- 0 -
2) Grad Stud	27,840	- 0 -
3) Local Grad Adv.	27,840	- 0 -
Total Per Diem	77,460	48,195
R & R Travel	5,010	21,710
Medical Evac.	6,600	26,400
Total Trave & Per Diem	247,070	104,055
IV Training	154,000	- 0 -
V Exp Equ & Mat	81,000	32,000
VI Non-Exp. Equ. & Mat.	70,000	45,000
VII Other Direct Costs	60,000	362,000
Subtotal	858,745	1,529,755
Contingency 5%	42,937	76,488
Subtotal	901,682	1,606,243
Inflation 8% (Compd.)	393,805	701,520
Subtotal	1,295,487	2,307,763

Detailed F O A L.C. Budget - Alternative I

	<u>Phase I</u> <u>L.C.</u>	<u>Phase II</u> <u>L.C.</u>
VII Instructional Farm		
a.) Establishment Costs	260,200	- 0 -
b.) Perimeter Fencing	102,900	- 0 -
c.) On-Farm Water Distr.	135,800	- 0 -
d.) Water System to Farm	553,900	- 0 -
e.) Crop Sci Field Lab	-	181,500
f.) Livestock Field Lab	-	133,100
g.) Poultry Field Lab	-	450,000
h.) Farm Shop	-	35,300
i.) Site Dev.	117,500	- 0 -
j.) Int. during Constr.	-	197,020
Total Instr. Farm.	1,170,300	996,920
Contingency 9%	106,390	90,630
Subtotal	1,276,690	1,087,550
Inflation 10% (Compd.)	59,447	50,641
Total AID L.C. Budget	2,631,624	3,445,954

15

F O A Detailed Dollar Budget - Alternative 2 and 3

	Phase I (Alternative 2)	Addition for <u>Team Leader</u> (Alternative 3)	Addition for <u>Farm Machinery</u> (Alternative 3)
I Salaries & Wages			
1.) A) On Campus	573,750		
2.) TDY			
a.) Project Consultant	50,000		
b.) Grad. Stud. Super.	267,960		
Total On-Campus Sal. & Wages	891,710		
B) Off Campus			
a.) Faculty Adv.	250,000	385,000	
b.) TCN Fac.	629,000		
c.) Farm Mgr.	214,500		
Total Off-Campus Sal. & Wages	1,093,500		
C) Fringe Benefits			
a.) On-Campus (28.2%)	161,797		
b.) Off-Campus (28.2%)	130,848	108,570	
c.) Off-Campus TCN (24%)	150,960		
Total Fringe Benefits	443,611		
Total Salaries & Wages	3,002,571		
II Indirect Costs			
a.) On Campus 30%	172,125		
b.) Off Campus 19.5%	213,233	96,246	
Total Indirect Costs	385,358		
III Allowances	1,181,081	393,693	
IV Travel and Transportation	1,172,846		83,325
V Exp. Equ. & Material			
On Campus	8,000		
Off Campus	70,000	30,000	
Total Exp. Equ. & Material	78,000		
VI Total Non-Exp Equ. & Mat.	450,000	40,000	

F O A Detailed Dollar Budget - Alternative 2

		<u>Addition for Team Leader</u>	<u>Addition for Farm Machinery (Alternative 3)</u>
VII	Instructional Farm Irrigation Equipment Machinery	93,000	151,500
VIII	Other Direct Costs	10,000	4,000
	Subtotal	6,372,856	1,057,509
	Contingency 5%	318,643	52,875
	Subtotal	6,691,499	1,110,384
	Inflation 8% (Comp.)	2,687,367	449,526
	Subtotal	9,378,866	1,559,910
IX	Participants	5,759,910	
X	A/E Design & Construction & Super.		
	A) Faculty building		
	a) Schematic Design	401,000	
	b) Site Inventory	250,000	
	c) Program of Requirement	43,000	
	d) Farm design	<u>236,000</u>	
	Total Faculty Building	930,000	
XI	Repayment to Core	100,000	
	Total AID Dollar Budget	16,168,776	

	Phase I Alternative 2	Addition for Team Leader (Alternative 3)
I Salaries and Wages	- 0 -	
II Operations	493,350	154,171
III Travel and Per Diem		
A) Travel		
a.) domestic	4,500	
b.) Intl.		
1) Dean	5,000	
2) Grad Stud	72,500	
3) Local Grad Adv.	72,500	
4) Intern Participant	5,000	
Total Travel	148,750	6,000
B) Per Diem:		
a.) Domestic		
1) Faculty Advisor	18,500	
2) Farm G- Mangr.	9,400	
Total Domestic Per Diem	27,900	37,800
b.) Intl.		
1) Dean	2,880	
2) Grad. Stud	27,840	
3) Local Grad Adv.	27,840	
Total Intern. Per Diem	58,560	
Total Per Diem	86,460	
C) R & R Travel	10,020	
D) Medivac	13,200	
Total Travel & Per Diem	258,430	
IV Training	154,000	
V Exp. Equ. & Mat.	81,000	
VI Non- Exp Equ. & Mat.	70,000	

F O A - Detailed L. C. Budget - Alternative 2 and 3

	Phase 1 Alternative 2	Addition for Team Leader (Alternative 3)
VII Instructional Farm		
a.) Establishment Costs	260,200	
b.) Perimeter Fencing	102,900	
c.) On- Farm Water Distr.	135,800	
d.) Water System to Farm	553,900	
e.) Crop Sci Field Lab	- 0 -	
f.) Live stock Field Lab	- 0 -	
g.) Poultry Field Lab	- 0 -	
h.) Farm Shop	- 0 -	
i.) Site Dev.	117,500	
j.) Int. During Constr. 10%	- 0 -	
Total Instr. Farm.	1,170,300	
VIII Total Other Direct Costs	360,000	16,000
Total AID L. C. Budget	2,587,080	213,971

TEAM MEMBERS

The Faculty of Agriculture Subproject of the USAID/Yemen Agricultural Development Support Program (Project 279-0052) was designed and written by a team from member universities and the Executive Office of the Consortium for International Development (CID) in conjunction with a team of YARG officials and staff at the University of Sanaa.

SUBPROJECT PAPER TEAM:

Roger K. Fendall, Team Leader, Assistant Dean of Agriculture, Oregon State University, Corvallis, Oregon.

John D. Wooten, Project Design Officer, Consortium for International Development/Executive Office, Tucson, Arizona.

Lewis A. Holland, Associate Dean, College of Agriculture and Home Economics, New Mexico State University, Las Cruces, New Mexico.

J. Ronald Miner, Acting Associate Dean and Director of Academic Programs, College of Agricultural Sciences, Oregon State University, Corvallis, Oregon.

Burr Fancher, Consultant in Vocational Education, Albany, Oregon.

Bonnie A. Stewart, Coordinator for the Development of International Research and Studies, Assistant Professor of Agricultural Economics, College of Agriculture and Home Economics, New Mexico State University, Las Cruces, New Mexico.

Roger Kraynick, Economist, Western Rural Development Center, Oregon State University, Corvallis, Oregon.

George H. Arscott, Department Head, Department of Poultry Science, Oregon State University, Corvallis, Oregon.

USAID PROJECT COMMITTEE:

H. Patrick Peterson, Agricultural Development Officer.

G. Tracy Atwood, Assistant Agricultural Development Officer.

David Fredrick, Program Officer.

Charles F. Weden, Jr., Director, USAID Mission, Sanaa, Yemen Arab Republic.

CID/CORE YEMEN STAFF:

Robert E. Witters, Chief of Party.

Milton M. Snodgrass, Agricultural Planning Advisor to the MAF.

YARG OFFICIALS/UNIVERSITY OF SANAA:

Nasser A. Aulaqi, Associate Professor, Dean, Faculty of Commerce and Economics, University of Sanaa.

Ali E-Shekeil, Dean, Faculty of Science, University of Sanaa.

Mohammed A. Mohsin, Director, Technical Office, University Administration, University of Sanaa.

Mohammed Sadi, Assistant Director, Technical Office, University Administration, University of Sanaa.

Mohammed Al-Harazi, Director of Agricultural Education, Ministry of Education.

Abdul Hafiz Karhash, General Co-Manager, CID Agricultural Development Support Program.

AbuBaker Al-Qirbi, Vice Rector, Dean, Faculty of Medicine, University of Sanaa.

Ahmed Hamza Al-Yamani, Assistant Professor, Faculty of Science, University of Sanaa.

Fatehy Salem Ali, Deputy Minister of Development, Central Planning Organization.

TABLE OF CONTENTS

Team Members	I
Table of Contents	III
List of Tables	V
List of Figures	IX
Acronyms	X
I. Summary	1
A. Overview	1
B. Subproject Paper (SPP) and Subproject Identification Document (SPID) Issues	4
II. Background and Setting	17
A. Background	17
B. Trained Manpower as a Constraint to Development	17
C. Relationship to Development Strategy	18
III. Detailed Project Description	23
A. Purpose and Summary Components	23
B. Broad Elements of the Development of the FOA	24
IV. Project Analysis	26
A. Technical Analysis	26
B. Social Soundness Analysis	56
C. Economic and Budgetary Analysis	64
D. Summary Financial Plan	62
E. Institutional Analysis	63
V. Implementation Arrangements	73
A. Implementation Strategy	73
B. Implementation Schedule	74
C. Project Evaluation	75
D. Subcontracting Plan	83
Annexes	
A. SPID Approval Message; SPP Cable STATE 106637; Statutory Checklist; 611(a) Certificate	A-1
B. Logical Framework	B-1
C. Approval Initial Environmental Examination	C-1
D. YAKG Request for Assistance and Presidential Decree	D-1
E. Technical Analysis	E-1
F. Social Soundness Analysis	F-1
G. Economic and Budgetary Analysis	G-1
H. Manpower Assessment	H-1

I.	Detailed Financial Plan	I-1
J.	Instructional Farm Analysis	J-1
K.	A/E Prefeasibility Report	K-1
L.	A/E Scope of Work	L-1
M.	Detiled Implementation Schedule	M-1
N.	Alternative Phasing of the FOA Subproject	N-1
O.	Initial Work Plan	O-1
P.	Previous Experience and Lessons Learned	P-1
Q.	Justification for Waivers	Q-1
R.	Eighth Amendment to Project Authorization	

LIST OF TABLES

1.	Summary Financial Plan — FOA Components	5
1a.	Construction Site Development and A/E Design and Construction Supervision Cost Estimates for Faculty and Instructional Farm Buildings, FOA Subproject	6
2.	Applications of Lessons Learned to SPP Development. Evidence from Previous Projects	14
3.	Broad Elements of the Development of the Faculty of Agriculture	25
4.	Person-Year Analysis of On-Campus Subproject Management and Support, In-Country Technical Assistance and Participant Training	51
5.	Present Value Costs Per Retained Graduate: Base Level Run	65
6.	Summary Financial Plan-FOA Components	70
7.	Summary Financial Plan for Faculty of Agriculture Subproject	71
8.	Monitoring and Reporting Plan (Provisional)	77
9.	Significant Subproject Milestones, Subproject Year, Evaluation Type, Key Questions to be Asked, and Basic Decisions to be Made During and Beyond the FOA Subproject	79
10.	Overview of Faculty of Agriculture Subproject Evaluation Process Including Purpose, Proposed Key Questions to be Answered, Key Indicators and Assumptions, and Data Needed for each Internal and External Evaluation	80
E-1	Proposed Phasing of FOA Participant Training at U.S. Land-Grant Universities by Area of Specialization, Subproject Year, Study Emphasis, and Targeted FOA Responsibility	E-16
E-2	Staffing Plan of FOA Showing Phasing of Expatriate Staff by Trained Yemeni Through Subproject Duration	E-11
E-3	Recommended Curriculum for General Agriculture, University of Sanaa Faculty of Agriculture	E-19
E-4	General Agriculture Curriculum Emphasis Areas	E-20

E-5	Conceptual Model for ESL.	E-39
E-6	Projected Faculty Workloads at Maximum Enrollment.	E-42
E-7	Comparison of Secondary School (Science Option) Curriculum with Proposed Curriculum for Basic Science Year in Faculty of Agriculture.	E-46
E-8	Curriculum Comparison for Agricultural School/Faculty of Agric. (Ibb and Surdud).	E-47
E-9	Relationship of Agricultural Secondary Curriculum to Proposed FOA Curriculum (Sanaa Veterinary School).	E-48
E-10	Alternate Participant Training Schedules.	E-49
E-11	Number of Students by Year, Sex, and Academic Years, 1979/80 - 1982/83, University of Sanaa.	E-54
E-12	General Census of University Students - Academic Year 1982-83.	E-55
E-13	Number of Faculty Members by Academic Year and Origin, University of Sanaa.	E-56
E-14	Number of Staff Members by Origin, Rank, Sex and Faculty, University of Sanaa.	E-57
F-1	Growth in Schools and Enrollment in the YAR Educational System, 1962/53 to 1981/82.	F-10
F-2	Student Enrollments in the Primary, Preparatory, Secondary, Teacher Training and Technical Institutes and Universities.	F-12
F-3	Interest Survey Results for the Omar Ibn Abd Al Aziz Secondary School in Hodeidah: Third Level.	F-24
F-4	Analysis of Secondary Student Response to Post-Secondary Education Preference Questionnaire, Yemen Arab Republic, November 1983.	F-25
G-1	Least Cost Indicators. Parameters, and Variables.	G-5
G-2	Costs of Establishing and Operating a Faculty of Agriculture at University of Sanaa: Results of the Base Level Analysis.	G-10
G-3	Costs of Training Students Abroad in Arab and U.S. Institutions.	G-11
G-4	Results of the Graduate Equivalent Function - Base Level Analysis.	G-12

25

G-5	B.S. Level Graduates Retained by YAR and MAF. Base Level Analysis.	G-12
G-6	Present Value Costs Per Retained Graduate: Base Level Analysis.	G-12
G-7	Summary of Sensitivity Analysis Findings.	G-14
G-8	Summary of YARG Current Operations: Financial Conditions (YR millions).	G-19
H-1	Estimates of the Number of Professionals and Para-Professionals in YAR, 1975.	H-5
H-2	Comparison of Representation Salary Levels for Professionals and Para-Professionals in YAR, 1983.	H-8
H-3	Yemeni Students Sent Abroad for University Training in Agricultural Fields from 1974 through 1980, MAF Projections of Expected Returns of Such Students, and Actual Returns to MAF through June 1982.	H-10
I-1	Summary Financial Plan for Faculty of Agriculture Subproject.	I-1
I-2	Summary of Detailed Worksheets for AID Dollar Budget - FOA.	I-2
I-3	Detailed Worksheets of AID Dollar Budget.	I-3
I-4	Summary of Detailed Worksheets for AID Local Currency Budget, FOA.	I-7
I-5	Detailed Worksheets for AID Local Currency Budget, FOA.	I-8
I-6	Summary of Detailed Worksheets for YARG Budget and Donor Parallel Financing, FOA.	I-11
I-7	Detailed Worksheets for YARG Local Currency Budget, FOA.	I-12
J-1	Percentage of the Economically Active Yemeni Population Engaged in Various Occupations (1975).	J-2
J-2	Agriculture vs. Total Industrial Output for YAR (1979/80).	J-3
J-3	Education Status for the Yemeni Population 10 Years and Older (1975).	J-5
J-4	Estimated Number of University Trained Manpower for the Agriculture Compared to Estimated Need for the Four Year Period 1979-1980.	J-6

J-5	Distribution of Pre-University of Sanaa During 1979/80.	J-7
J-6	Students and Faculty at the University of Sanaa During 1979/80.	J-8
J-7	Students on Grants in Arab and Friendly Countries During 1979/80.	J-9
J-8	Precipitation in Four Areas in YAR.	J-14
J-9	Precipitation for Sanaa from 1963-1981.	J-15
J-10	Temperature for Sanaa.	J-16
J-11	Land Use in the YAR.	J-17
J-12	Type of Agricultural Land.	J-18
J-13	Production of the Main Crops in YAR and in the Government of Sanaa for 1979/80.	J-19
J-14	Major Plan Commodities Consumed in YAR.	J-20
J-15	Suggested Allocation of Land to Various Uses as a Function of the Size of the Water Supply.	J-33
0-1	Current Approved Activities, FOA Subproject	0-5
0-2	Current Program/Subproject Staffing Status: FY 83-84 W.P. #Initial Subproject: Faculty of Agriculture	0-6
0-3	New Activities Which May be Proposed by FY 83-84. Subproject: Core	0-7
0-4	Implementation Schedule 3/1/84 to 9/30/84 Subproject Faculty of Agriculture	0-8

X
2

LIST OF FIGURES

1	Organizational Chart for FOA Subproject Administration and Technical Assistance.	48
2	Proposed Phasing Plan for FOA Subproject.	49-50
E-1	Proposed Organization for Faculty of Agriculture, University of Sanaa, End of Project Status (1993).	E-6
E-2	Proposed Organization for Faculty of Agriculture, University of Sanaa, Intermediate Status (1999).	E-7
E-3	Proposed Organization for Faculty of Agriculture, University of Sanaa, Ultimate Status (2010).	E-8
E-4	Faculty of Agriculture - Policy Linkages.	E-14
E-5	Faculty of Agriculture - Training Linkages.	E-15
E-6	Faculty of Agriculture - Research Linkages.	E-16
E-7	Faculty of Agriculture - Linkages to Impact Farm Households.	E-17
E-8	Administrative Structure of Sanaa University.	E-52
F-1	The Religious Educational System in the YAR (Kuttab).	F-8
F-2	Secular Educational System in the YAR (1981/82).	F-9
F-3	Sources of Students for the Faculty of Agriculture (FOA).	F-21
F-4	Student Educational Preference Questionnaire.	F-22
G-1	Flow Chart Indicating the Computation of the Least Cost Indicators.	G-8
J-1	Map of Demonstration Farm.	J-30
J-2	Off-Campus Well Location.	J-34
J-3	Farm Office and Crops Laboratory Building.	J-48
J-4	Farm Livestock Center.	J-49
J-5	Open Corral Area-Livestock Center.	J-51
J-6	Poultry Building.	J-52
J-7	Feed Center and Pump House.	J-53
J-9	Farm Shop and Equipment Storage.	J-54

ACRONYMS

ACB	Agricultural Credit Bank
ADO	Agricultural Development Office
ADSP	Agricultural Development Support Program
A/E	Architectural and Engineering
ARDA	Agricultural Research and Development Authority
ASA	Agricultural Sector Assessment
CARS	Central Agricultural Research Service
CBD	Congress Business Daily
CID	Consortium for International Development
CID/Yemen	Consortium for International Development/Yemen Office
COP	Chief of Party
CPO	Central Planning Organization
DLRC	Documentation and Learning Resource Center
EOPS	End-of-Project Status
ESL	English as Second Language
FAPU	Faculty of Agriculture Planning Unit
FAO	Food and Agriculture Organization of the United Nations
FOA	Faculty of Agriculture
FOS	Faculty of Science
FFYP	First Five Year Plan (1976-1981)
HITS	Horticulture Improvement and Training Subproject
IBRD	International Bank for Reconstruction and Development

ISAI	Ibb Secondary Agricultural Institute
LDA	Local Development Authority
LGU	Land Grant University
MAF	Ministry of Agriculture and Fisheries
MOE	Ministry of Education
NES	National Extension Service
NE/TECH/AG	Near East Bureau, Office of Technical Support, Agricultural Development Division
OSU	Oregon State University
PETS	Poultry Extension and Training Subproject
PV	Present Value
RRC	Regional Research Center
SFYP	Second Five Year Plan (1981-1985)
SOW	Scope of Work
SPD/FOA	Subproject Director/Faculty of Agriculture
SPID	Subproject Identification Document
SPP	Subproject Paper
SURDP	Southern Uplands Rural Development Project
TDA	Tinama Development Authority
TDY	Temporary Duty
TL	Team Leader
UNDP	United Nations Development Program
UOS	University of Sanaa
USAID	United States Agency for International Development
USAID/W	United States Agency for International Development/Washington D.C.

USAID/Y United States Agency for International Development/Yemen
Arab Republic

YAR Yemen Arab Republic

YARG Yemen Arab Republic Government

YR - Yemeni Rial(s): YR 1.00 - \$0.22

YR 4.68 = \$1.00

I. SUMMARY

A. Overview

1. Progress to Date

The design of the Faculty of Agriculture technical assistance project began in 1981. Pre-subproject funding of \$500,000 was approved and is being used for design of the instructional farm. The University of Sanaa has contracted to drill a well for the farm and may fund the transmission line. The Faculty of Agriculture opened in the fall of 1984 (two years ahead of schedule) with 25 students taking their first year courses in the Faculty of Science.

This project paper is already out-of-date as it assumed that the first class would begin in the fall of 1986 and that the faculty buildings would be constructed and the farm in full operation by the fall of 1987. The assumption that funding for construction would be available and, therefore, design and construction activities would begin in 1984 is unlikely to be fulfilled. As a result, the implementation will proceed on a different schedule than that described in this project paper although the 29.2 million dollar AID contribution should still be adequate. Third country national teachers will be needed in the fall of 1985 rather than the third project year, and the Faculty Advisor to the Dean is needed immediately. The design of the Faculty buildings and construction supervision of the farm will likely be delayed a year or more. The YARG contribution will increase since they will bear the operational costs of temporary faculty facilities and salaries earlier than planned.

Because the status of the YARG commitment to establish the Faculty of Agriculture is changing so rapidly, the project paper was not revised. Given the opening of the Faculty and other implementation changes which will undoubtedly occur during the next few months, it was concluded that it would be futile to continually revise the paper to keep it current. The rapid pace of implementing the Faculty of Agriculture by the YARG, albeit in temporary facilities, is perhaps one of the best arguments for immediate authorization of the AID contribution to this effort.

2. Recommendation

a) Authorization of a grant of \$29.2 million for ten years to the Yemen Arab Republic Government (YARG) for implementation over an eleven year period of the Faculty of Agriculture (FOA) Subproject under the Title XII Agricultural Development Support Program (ADSP). The project will provide technical assistance, training, instructional farm development, and limited commodity support for a new faculty and architectural and engineering (A/E) services for the design and construction supervision of the faculty building.

b) Approval of waivers. (Annex Q)

A waiver for three (3) vehicles in the amount of \$45,000. The vehicle waiver includes a source-origin waiver from Code 000 to Code 935, a proprietary procurement waiver permitting the purchase of Toyotas and/or Daihatsus, and a single-source waiver permitting the purchase from the official local dealer/distributor.

A waiver of source-origin from Code 000 to Code 935 countries for off-shelf procurement in YAR of equipment and supplies from European or Japanese manufacturers. Amount of estimated procurement is \$259,000.

A transportation source waiver permitting financing of costs of transportation on Code 899 flag vessels.

3. Purpose

To support the establishment within the University of Sanaa (UOS) of Yemen's first FOA which will be responsive to the Yemen Arab Republic's (YAR) agricultural development needs, is supportive of private and public sector development, and has appropriate linkages to the agricultural sector's production and institutional structure.

4. Justification

a. Agriculture is the largest sector of the YAR's economy. Traditional agricultural practices prevail and agricultural productivity in real terms is very low. Lack of a trained Yemeni labor force in agriculture and the resulting low labor productivity are major constraints for the agricultural sector.

b. The Agricultural Sector Assessment (ASA) concluded that the highest United States Agency for International Development (USAID) priority in agriculture should be assistance to education, emphasizing (in order of priority) B.S. level and secondary school level agricultural education.

c. The estimated demand for an agriculture labor force in the public and mixed sector and trained to the bachelor degree level is 1,540 persons through 1991 according to the YARG manpower study used in preparing the Second Five Year Plan (SFYP). The most efficient manner of meeting this long-range demand for B.S.-trained agriculturalists is to develop an indigenous FOA at the UOS with Yemeni professors.

d. The United States Government, through USAID, is a world leader in establishing agricultural colleges and universities in developing countries. The Consortium for International Development (CID), the contractor for the Agricultural Development Support Program in Yemen, is composed of 11 U.S. agricultural universities, and has a comparative advantage in the development of a FOA at the UOS.

e. Agricultural production in the YAR is expected to increase when there are strong agricultural research, extension, and education/training institutions which are linked in a supportive triangular arrangement. Such coordination and mutual support depends on the existence of these three institutions in Yemen. One side of this supporting arrangement is missing as long as education at the post-secondary level is being done outside Yemen in numerous countries and institutions. Establishing a FOA in Yemen will provide the higher education side of the triangular arrangement and will also assist in the coordination with the other two sides through short-term and in-service training and through research by faculty members.

5. Method of Implementation

The proposed FOA Subproject will be implemented as an activity under the ADSP and will be accomplished via three overall contracts. First, a contract amendment will be negotiated to the ADSP contract between USAID and CID for CID to provide technical assistance, commodity procurement, participant training, funds with which to develop the instructional farm, and overall subproject administration (including adequate campus backstopping). Second, USAID will negotiate a contract to provide A/E design and construction supervision services for the faculty. CID or USAID will negotiate a contract to provide the A/E design and construction supervision services for the instructional farm. Finally, the YARG will negotiate an agreement with another donor (most likely the Saudi Fund) to provide the financial resources with which to construct the faculty buildings. Implementation details are further elaborated in Annexes M and O.

CID will work closely with the U.S. A/E firm in an advisory role as design specifications for buildings are developed. For the instructional farm, CID will develop the initial layout and design specifications and the A/E firm will supervise the construction activities. For the faculty buildings, CID will provide on-campus consultation to the architects and engineers as design specifications are developed.

United States Agency for International Development/Yemen Arab Republic (USAID/Y) will provide general monitoring of the subproject through its Agricultural Development Office, which has broad responsibility for ADSP activities, and its Mission Engineer. In-country CID activities will be coordinated through the CID/Sanaa Office and the Core Subproject. CID has identified Oregon State University (OSU) as the lead university for the design and implementation of this proposed subproject.

6. Life-of-Project Costs

Table 1 summarizes the life-of-project expenditures for the FOA Subproject. USAID funding for an 11-year period will be used to train 29 prospective Yemeni faculty members to the Ph.D. level in the United States; establish an instructional farm on the FOA campus as an integral part of the curriculum; provide four professors to fill positions until Yemeni staff complete their training; provide training and advisory assistance for the Yemeni dean, librarian, English as a Second Language (ESL)/technical agricultural specialist, and instructional farm manager; purchase limited laboratory equipment; design the classroom/office building; and supervise construction of the same.

The YARG is providing the land, Yemeni staff and salaries, and operating costs. The YARG is seeking loan financing from another Arab country for construction of the classroom/office buildings.

Table 1a summarizes the construction, site development and A/E design and construction supervision costs for the FOA and Instructional Farm buildings.

7. Environmental Recommendation

A negative determination was approved on July 8, 1983 (see Annex C).

B. Subproject Paper (SPP) and Subproject Identification Document (SPID) Issues

The NEAC review of the SPID and SPP were summarized in State 22024, July 20, 1983 (SPID) and State 8477, April 11, 1984 (SPP). (See Annex A.) The issues raised in both reviews have been answered in this revision of the subproject paper and are discussed below. Each issue of concern identified as either SPID or SPP issue is quoted from the appropriate cable, and is followed by the USAID/CID response.

1. Economic and Financial Analysis

SPP Issue: NEAC was advised through a memo submitted by NE/DP that the economic analysis contained a significant methodological error and other questionable assumptions, while the financial analysis understated costs.

Response: The economic and financial analysis was completely rewritten in Annex C which is summarized in the main text, pp 64-68. A number of revisions of the budget are detailed in Annex I and summarized in Tables 1, 2, 3, 4, 5, 6 and 7 of the main text. The budget changes resulted in a collective budget increase of \$5.356 million over the initial SPP.

Table 1

Summary Financial Plan -- FOA Components^{1/} (\$000)

Category	USAID		YARG (\$ Equivalent)	Other Donor Parallel Financing	Estimated Total
	Dollar	Local Currency			
Land	-0-	-0-	12,400	-0-	12,400
Personnel	4,838	-0-	7,466	-0-	12,304
Allowances	1,575	-0-	-0-	-0-	1,575
Operations	-0-	1,233	2,708	-0-	3,941
Travel and Transportation	1,564	351	502	-0-	2,417
Commodity Support	1,241	228	-0-	-0-	1,469
Participant Training	5,760	154	-0-	-0-	5,914
Development of Instructional Farm					
- Constr. & Site Development	(-)	(2,167)	(-)	(-)	(2,167)
- A/E Design & Supervision	(354)	(-)	(-)	(-)	(354)
- Non Built-in furnishings and Equipment	(464)	(-)	(-)	(-)	(464)
Subtotal	818	2,167	-0-	-0-	2,985
Development of Faculty Buildings					
- Constr. & Site Development	(-)	(-)	(-)	(15,160)	(15,160)
- A/E Design & Supervision	(2,549)	(-)	(-)	(-)	(2,386)
- Non Built-in Furnishings and Equipment	(-)	(-)	(-)	(2,940)	(2,940)
Subtotal	2,549	-0-	-0-	18,100	20,486
Other Direct Costs	145	422	-0-	-0-	567
SUBTOTAL	18,490	4,555	23,076	18,100	64,221
Contingency @ 5% or 10%	486	316	534	1,378	2,714
Inflation, compd. @ 8% or 10%	4,134	1,205	7,972	6,428	19,739
TOTAL (ROUNDED)	23,110	6,078	31,582	25,906	86,675

^{1/} Differences due to rounding

92

Construction Site Development and A/E Design and Construction Supervision Cost Estimates for Faculty and Instructional Farm Buildings, FOA Subproject.

Cost Estimate Item	Faculty Buildings		Instructional Yemeni Rials (Thousands)	Farm Buildings U.S. Dollars (Thousands)
	Yemeni Rials (Thousands)	U.S. Dollars 1/ (Thousands)		
I. Construction and Site Development				
A. Buildings and site per Gauthier, Alvarado and Associates (GAA), Annex K, p. 17. for FOA building; Annex I, P. 1-12 for Instructional Farm buildings.	64,596	(13,782)	9,233	(1,970)
B. Interest during construction, @ 10%, omitted by GAA from FOA estimates.	6,459	(1,378)	923	(197)
C. Physical contingency, @ 10%	6,459	(1,378)	923	(197)
D. Non Built-in furnishings, per GAA for FOA buildings, Annex I, p. 1-8, for Instructional Farm Buildings.	13,780	(2,940)	2,175	(464)
E. Escalation for price inflation, per GAA for FOA buildings, Annex I, p. 1-10 for Instructional Farm Buildings.	30,128	(6,428)	520	(111)
Total Construction & Site Development Costs	121,421	(25,906)	13,775	(2,939)
II. A/E Design and Construction Supervision				
A. Preliminary A/E work, (Program of Requirements, Site Inventory).	-0-	(68)	-0-	-0-
B. Final Design, (Design Development, Contract Documents, Bid Analysis), @ 10% of base construction cost less Non Built-in furnishings.	-0-	(1,654)	-0-	(236)
C. Construction supervision, @ 5% of base construction cost less Non Built-in furnishings.	-0-	(827)	-0-	(118)
Total A/E Design and Construction Supervision Costs	-0-	2,549	-0-	354
Total Construction, Site Development, A/E		28,455	-0-	3,293
1/ Converted on basis YR 1.00 = \$.213				

-6-

37

2. Recurrent Costs

SPP Issue: Mission should emphasize to YARG the necessity of budgeting for recurrent costs on a timely basis and better forward budget planning. SPID Issue: USAID/Y should be sure that the YARG understands fully what costs it will have to provide on a continuing basis when this project becomes operational.

Response: USAID concurs that better YARG forward budget planning is needed. This is an issue which plagues all our projects in all sectors. To date we have had little success in longer range budgets, although we have had some success on annual budgets. Under the overall ADSP, however, we are seeking to ensure that YARG budget requirements integral to the success of the ADSP are known in advance of the budget process so that they may be incorporated in MAF and MOE budget requests. We will, of course, treat the FOA SP similarly.

A recent World Bank analysis of the public finance and public expenditure situation in the YAR indicates a potential for significant budgetary deficits over the longer term. Stabilized remittance incomes, inability to collect all of the import duties now authorized, emergency expenditures (military, earthquake relief, etc.), the inability to replace expatriate professionals in the educational system who remit salaries abroad, etc., all threaten the ability of the YARG to fulfill the objectives of the SFYP.

The issue of recurrent costs for the FOA is difficult to assess in this context, but is brought into focus in Annex G, pp G-19 to G-22. Special emphasis has also been given to recurrent costs in Section IV. C, pp 64-68 of the SPP.

This issue has been discussed with a wide range of the YARG officials, staff and UOS administrators and USAID/Y has formally presented the recurrent cost budget to the YARG's Minister of Development. The YARG has assured USAID that they understand the implications, and are prepared to connect the resources required to operate the Faculty of Agriculture. Given the UOS's good record during a decade of rapid institutional growth, we believe the University will make every effort to accommodate the FOA's budgetary needs through the subproject implementation phase and beyond.

In fact, budgetary allocations for the MOE and the UOS generally have kept pace with planned expenditures implied by the First Five Year Plan (FFYP) (1976-1981) and in the first year (1982) of the SFYP. We will, of course, continue to keep an eye on actual expenditures against SFYP targets to determine if problematic trends are developing.

3. Capital Construction

SPP Issue: Two capital construction components are contained in the subproject paper, neither of which has fully budgeted the costs involved. In addition, the construction and A and E costs are probably understated.

Response: NE/PD's suggested revisions (State 094359) included re-calculations of budgets for construction elements to reflect the devaluation of the Rial which had taken place only a little earlier. The Mission has chosen to return to the original conversion rate in the SPP calculations, believing that any benefits occurring to the project budget from R devaluation will be offset by inflationary increases in the cost of materials and services. Costs of A and E design and construction supervision were, however, increased by \$1.2 million in the revised budget.

4. Adequate Supply of Agricultural Students

SPP Issue: The analysis of student commitment to Agriculture is not convincing. The interest survey of student performance failed to ascertain whether respondents actually intended to make their careers in agriculture. The fact that agriculture was usually a second or third preference may indicate that the field was seen as an easier route to university acceptance rather than a longer-term interest. The SPP suggests (pp F-25) that special incentives may be necessary to obtain sufficient students for the Faculty of Agriculture. These concerns must be addressed in more detail in the SPP.

SPP Issue: Other established and proposed faculties within the University system will compete for the limited number of students graduating from the agricultural secondary schools, as well as from other secondary schools. The SPP might consider a summer school program and/or the provision of a fifth year, as methods to bring in secondary students who might not otherwise qualify for admission to the Faculty.

Response: An interest survey conducted in three agricultural schools and six science option secondary schools (Section III-C, pp F-20 to F-27) indicated that over 50% of those surveyed listed agriculture among their top three college choices. University administrators estimate that at least 10% of potential FOA students will come from science option secondary schools. A total of 5,562 students took the 1984 secondary school final exams, of which 3,427 were in the science option and therefore may qualify for four faculties (Science, Engineering, Medicine, and Agriculture). Current enrollment in the three agricultural secondary schools (Ibb, Surdud, livestock) adds another 67 persons to the "pool" of prospective students. With 3,494 prospective students currently in the "pool", the enrollment projections would be met if only about 4.8% enrolled in the FOA. Table F-4, Annex F, would lead one to conclude that this goal is readily attainable. The general consensus of secondary administrators, supported by the data in Annex F, is that there will be far more students than available training slots.

The University of Sanaa began admitting students to the Faculty of Agriculture in the Fall of 1984. Only 25 students can be accommodated in the Faculty of Science facilities for the first year. At the end of September 1984, with admission procedures only half completed, there were already 30 qualified applicants for the Faculty of Agriculture. Twenty to thirty more qualified applicants are expected before this year's admissions are completed. The Faculty of Agriculture requires a minimum high school scholastic score of 70 in comparison with the Faculty of Medicine requirement of 75.

The potential "pool" of qualified students who may choose to enter the Faculty of Agriculture will expand considerably as the secondary school science option enrollment expands. In addition, in 1983 there were 495 Yemeni studying for agriculture B.S. degrees in other countries. When the Faculty of Agriculture is in full operation, many of these donor-funded agriculture B.S. scholarships for study outside Yemen will likely be eliminated.

5. Women in Development/Role of Women

SPP Issue: The issue of women and their relationship with the Faculty of Agriculture should receive more attention in the revised SPP. Consideration might have to be given to the construction of specialized facilities for women attending the faculty, as was done at Kabul University. In addition, specialized courses might also have to be considered.

SPP Issue: Serious thought must be given to attracting and hiring women into the project at an early date, especially since a large number of Yemeni men have left agriculture and women have taken their places on the farm. The curriculum that is to be designed for the faculty should encourage women to enroll from the onset, in courses that will accelerate their study of the agricultural sciences. This is particularly relevant since women at this time comprise almost a majority of the students at the UOS. In addition, specific courses designed for women in home economics and nutrition could also be included. These issues should be considered in the social analysis section of the SPP.

Response: The FOA SPP proposes that men and women students within the FOA be treated similarly, both in terms of facilities provided under the SP and courses offered within the college. Although the NEAC cable suggested that USAID consider construction of specialized facilities, we have chosen not to do so because there is no evidence that specialized living quarters, such as were constructed at Kabul University, would have any impact on female enrollment. Sanaa University currently has a sizeable female enrollment, and female students in other colleges live with their families or relatives, or in supervised boarding houses. There is no reason to conclude that women agricultural students would require different accommodations.

Similarly, the SP does not include a specialized women's course; e.g., home economics, because it is generally accepted that an emphasis on home economics, or other traditional "women's" subjects, segregates women further from mainstream economic activity and does not address areas like agricultural income generation, which are more relevant to the daily lives of many Yemeni women.

6. Curriculum Development

SPP Issue: Some concern was raised about the training of all the students as generalists, in view of the fact that many will become extension agents, who will be only minimally qualified to assist farmers. In addition to the training which the faculty will provide to those destined to work in the Ministries and the schools, NEAC concluded that the curriculum should also provide training to prepare students for jobs in the private sector where possible.

Response: This issue was resolved during the NEAC meeting. The graduates of the Faculty of Agriculture are intended to be generalists. However, there is significant depth of subject matter in each of the 9 major areas of emphasis - animal/poultry science, plant/crop/soil science, agricultural economics, agricultural engineering, horticulture, food technology, pasture/range management, entomology/plant pathology, and extension methods. The subjects covered within emphasis areas are presented in Table E-4, pp E-20 to E-30. The training is appropriate for employment in the private as well as public sector. The curriculum targets the needs of all students, regardless of the job market in the public or private sectors. Specific courses offered which are appropriate for private sector employment include farm management, agricultural policy in Yemen, fiscal and personnel management, etc. As the curriculum and individual course offerings are further developed, they will be reviewed to ensure that private sector applications receive adequate emphasis.

SPID Issue: The NEAC was concerned that many of the proposed courses for the FOA in the natural and biological sciences are also taught in other faculties of the UOS. If it is determined that these other faculties are willing to provide instruction in these courses, then the SPP must address the issues of whether they can support the FOA curriculum at the level being proposed. It is of utmost importance that the design of the SPP provides for elimination of as much duplication as possible. The type of training that the faculty would offer was another concern. For example, is provision being contemplated for other than traditional B.A./B.S. degree training in agriculture, such as non-formal short courses, in-service training, extension/demonstration activities, etc.?

Response: The SPP team members have worked closely with the Faculty of Science (FOS) in the development of the core science block for first-year students. The Faculty of Science teaches science classes for other faculties in the UOS. The Dean of the Faculty of Science is committed to providing staff to teach science courses in the FOA. Once the FOA building is completed, university science professors will come to the science labs in the FOA to teach the FOA students. This issue is clarified and strengthened in Annex E, pp E-18 to E-31 of the SPP. The FOS will instruct FOA first-year students throughout this subproject, and for the foreseeable future.

The FOA will place a strong emphasis on research and extension. As part of the extension activities, a wide range of short courses, demonstrations, in-service activities, and adult education classes will be centered in the classrooms, laboratories, and instructional farm of the FOA. Further explanation of short-term non-degree instruction is found in Appendix E.

The social soundness analysis in the SPP (Annex F) answers the issues on roles of women in the FOA, both as students and as faculty. The proposed general agricultural curriculum has been developed in harmony with the social soundness analysis and found to be appropriate for both women and men. Strategies for attracting women into the FOA are integrated into the social soundness analysis. Annex E (Table E-11) shows the enrollment level of women at the UOS to be 12%. A detailed analysis of women's roles in the FOA is found in Annex F.

7. Poles of Power/Interministerial Faculty Conflict

SPP Issue: There needs to be some formal as well as informal structure which will mesh the Ministries with the faculties in order to avoid university versus Ministry conflicts which have occurred in similar activities in other countries.

Response: A Faculty of Agriculture Planning Unit was established in 1981 with representatives from the Ministry of Agriculture, the University of Sanaa, and CID. This formal structure can be maintained as long as it is needed. A covenant is included in the draft project agreement which calls for establishment of a joint working committee composed of YARG, USAID, and any other external donor to "discuss implementation issues and coordinate the development of all aspects of the Faculty of Agriculture including at a minimum, construction, personnel and administrative matters."

USAID recognizes that the potential for University versus Ministry conflicts exists, but does not believe that a formal solution can be developed in advance of the problem's occurrence. If and when such problems do occur, we would expect that CID and USAID would be able to address them as part of the normal Agriculture Development Support Program dialogue with MAF, MOE, and the University of Sanaa. In the interim, if AID/W has suggestions to offer on how to resolve these issues, based on similar problems in other countries, we would be happy to review their applicability to this SP.

8. Backward and Forward Linkages

SPID Issue: The role of the FOA in the whole agricultural sector must be delineated in more detail. Following are typical questions which the SPP should address. What is the relationship of the FOA with the MAF? What is the relationship with the private sector? What linkages exist at this time between other faculties at the university? What administrative regulations permit coordination among these various faculties? What are the linkages that exist between the faculty and the secondary schools?

Response: Linkages have been explored extensively by the SPP team because of their importance in accomplishing the objectives of the FOA subproject. The team met on numerous occasions with policy-making personnel of the MOE, MAF and UOS, USAID/Yemen, CID/Yemen, agricultural secondary schools, regular secondary schools, Sanaa Livestock School, regional development associations, international donor-funded research and demonstration projects, and existing extension organizations. The team's primary conclusion was that many important linkages have already been established and others are evolving in an orderly fashion. The linkages already established, and other proposed linkages, are presented diagrammatically and discussed in Annex E (Figures E-4, E-5, E-6 and E-7, pp E-14 to E-17).

9. Participant Training

SPID Issue: The SPID provides for long-term training for 15 faculty members. This number appears to be insufficient when viewed from actual situations such as dropouts, non-returnees, and those who will take other jobs when they do return. This number also appears to be rather thin when considering the teaching, research, and extension roles which the faculty will be called upon to perform. The SPP design team should re-examine the actual number of participants which the project should train.

Response: The SPP team has conducted lengthy discussions with UOS officials and prepared a detailed analysis of the staffing needs of the FOA. The number of Yemeni to be involved in long-term training has been increased from 15 to 29. This number is based on the requirements of the curriculum, current retention rates for participants, and the extension and research responsibilities of the faculty members. The specific staffing and training plans for the FOA are included in Annex E. Recommendations for the involvement of women as participant trainees are found in Annex F.

10. Administrative Operations

SPID Issue: Questions were raised as to who would carry out administrative functions related to the FOA. Will these functions be the responsibility of the FOA, or will they be conducted by the central university administration? How will they be financed? Issues in the administrative area should be adequately covered in the SPP by a public administrative specialist.

Response: A public administration specialist has examined the administrative structure and linkages in depth. Annex E, pp E-51 to E-58, has sections devoted to the clarification of this issue. The organization of the evolving UOS and the proposed FOA is similar to those which have proven effective in the U.S. Land Grant Universities.

The division of administrative responsibilities between the University and the Faculty seems logical and consistent with the capabilities of each.

11. Past Experiences and Lessons Learned

SPP and SPID Issue: NEAC concluded that there are several well-known projects in which AID has assisted in building Faculties of Agriculture which should be reviewed by the design team and considered in the final submission.

Response: The design team reviewed all information provided by PPC/E/PIU, and incorporated all appropriate recommendations as summarized in Table 2 of the SPP. While Annex F, pp F-14 to F-17 outline summary recommendations from other efforts to establish educational institutions in the Middle East, Annex 1 synthesizes these recommendations and evaluates their applicability to the design of this SP. For example, a study of 68 institutions, by group, of U.S. universities was particularly helpful in pointing out common design pitfalls. In addition, Annex P summarizes in some detail the lessons learned from the Hassan II Agronomic and Veterinary Institute in Morocco (assisted by the University of Minnesota) and the Kabul University Faculty of Agriculture project in Afghanistan (assisted by the University of Wyoming). Additional observations are made on the development of agricultural universities in India and Pakistan.

Table 2

Applications of Lessons Learned to SPP Development
Evidence from Previous Projects (See Annex F)

Issue	Evidence from Previous Projects (See Annex F)	Application in SPP
Establish strong institutional linkages	Moroccan Institut for Agronomie and Veterinarie (IAV) is very strongly linked with Moroccan Ministries. The linkage involves financial support for students, placement of students, research support of faculty.	Institutional Analysis (Annex E)
Identify government commitment to project	In the case of Agricultural Universities in India, state-level governments were responsible for support. In nearly every case, this created delays and shortfalls in budgets and significantly hindered otherwise good programs.	Institutional Analysis (Annex E)
Design project to further development plan of government	In the case studies examined, the prospective contributions to the national development plans stem as much from research as from the provision of trained personnel. In the long term, it is training personnel for the private sector which is expected to pay off.	Section II-C, Relationship to YARC Development Strategy
Establish clear lines of authority and relationships between project participants and sponsors	At Morocco's IAV, there have been other sponsors (France, a Belgian university) and various units of the higher agricultural education system in Morocco. The number of different entities has tended to make the contractor's (U. of Minn) role harder.	Summary I A-5 and Section III, Implementation Arrangements
Select a politically strong and technically competent counterpart agency	At Kabul University, the agricultural college was not strongly supported by the Ministry of Agriculture which was not a politically strong agency relative to the development of engineering facilities. A stronger ministry could have helped KU's FOA.	Institutional Analysis (Annex E)
Determine availability of and experience of local personnel	All of the case studies revealed that it was difficult to select participant trainees. Kabul University had perhaps the most severe problem owing to its relatively undeveloped general education system. Conversely, India had the least problem with participants.	Technical Analysis (Section IV-A)
Compensate for potential problems that result from bureaucratic process of host government	Each case study exhibited problems from the bureaucratic process in the host country. IAV in Morocco has implemented truly collaborative planning, analysis, and evaluation which has helped some. India's bureaucratic situation had distinctly adverse affects.	Social Soundness Analysis (Annex F) Technical Analysis (Annex E) Economic Analysis (Annex G) Detailed Financial Plan (Annex I)
Determine financial viability of target institution	At Kabul University, the recurring costs of the Faculty of Agriculture were higher than could be paid. A modified plan may have resulted if this situation could have been anticipated. In West Pakistan low faculty salaries were a problem.	Institutional Analysis (Annex I)
Design project for the adverse effects of inflation	Since three of the case studies involved the time period 1950 to 1970, inflation was not cited as a problem. At Morocco's IAV, (1970 to 1985), participant training costs were more than anticipated only in the first five years.	Detailed Financial Plan (Annex I)
Specify compatible project staffing levels	At each of the case study situations, the design involved a both a teaching and research institution. The faculties generally included many M.S. level participants as lab instructors and research technicians. Student-faculty ratios were about 7:1 to 9:1.	Technical Analysis (Annex E) Detailed Financial Plan (Annex I)
Specify realistic project staffing levels	(con't. from above) It may have been realistic to plan for the research component in Morocco, India, Pakistan. But in Afghanistan, it may have been more prudent to do as in this SPP: develop the B.S. level skilled personnel, then do research.	Technical Analysis (Annex E)
Provide for indigenization of the institution	The process of indigenization has proceeded most rapidly in Morocco where participant may only spend a year (or 2) abroad and are quickly brought back to teach. It proceeded most slowly in Afghanistan, where Americans taught, advised, did research.	Technical Analysis (Annex E)
Anticipate potential management of the institution	Afghanistan, Pakistan, Morocco all experienced shake-ups in agricultural university administration. It is difficult to determine whether these could have been anticipated. Certainly close watching of the university scene would have helped.	Institutional Analysis (Annex E)
Avoid over-identification of the institution with the U.S.	Most successful in this regard is the U. of Minn. at Morocco's IAV. IAV has some strong resemblances to a U.S. Land Grant College, but it is a uniquely Moroccan institution. Kabul University would have turned out the most like a U.S. institution.	Social Soundness Analysis (Annex F) Implementation Arrangements, Section V

14

15

12. Payment Schedule

SPP Issue: A new regulation has come into effect which requires that each PP discuss the method of payment which will be utilized in the project.

Response:

Methods of Implementation and Financing

<u>Method of Implementation</u>	<u>Financing Method</u>	<u>Approx. Amount (\$)</u>
1. Technical Assistance Services, misc. construction, commodities, participant training and misc. Other by direct contract with non-profit contractor.	FRLC	20,206,803
2. Project Assistance, Other, for contractor support, construction, and misc. from <u>local currency</u> implemented by non-profit contractor.	Direct Payment	6,077,578
3. Technical Assistance Services, A&E for design and supervision implemented by a profit-making contractor.	Direct Payment	2,903,000
Total Project		<u>29,187,381</u>

The above "Methods of Implementation and Financing" represents the broad categories of implementation and financing. There will probably be relatively small amounts used for evaluations, studies, etc. which will be implemented by direct contracts with profit/non-profit contractors, profit/non-profit IQCs, purchase orders and TAs which will be paid by direct payment.

This "Methods of Implementation and Financing" plan is in accordance with the general assessment submitted by USAID/Yemen in March 1984. It does not include any financing methods which would require separate justification.

Audit coverage will be scheduled by the USAID and the responsible Regional Inspector General's office. In addition, the USAID plans to schedule internal financial reviews over the life of the project as deemed necessary.

13. Evaluation Plan

SPP Issue: The evaluation plan should be revised with an evaluation schedule based on the information needs of the subproject rather than as part of a broader review of the overall ADS program. Internal evaluations would utilize the collaborative assistance approach and thus expose MAF counterparts to the concept and value of evaluation. USAID/Yemen should be directly responsible for all aspects of external evaluations. The purpose for each evaluation should be explained in the evaluation plan narrative with key issues identified. Data requirements should be discussed and funds budgeted for both collection and evaluation as necessary.

SPIID Issue: The framework for data collection, as well as a more detailed budget, must be developed in the SPP. The data collection strategy should not be defined by the technicians provided under the project. Data collection should stand alone as a distinct component of the project and be closely integrated into the implementation plan.

Response: The evaluation plan was completely revised and expanded in Section V, pp 76-83, of the SPP. The plan calls for development of baseline data from which to measure subproject progress; establishes subproject milestones for the conduct of internal and external assessments; identifies key question indicators and assumptions to be addressed in each evaluation, and outlines the data needed to reach conclusions. The plan includes a strong evaluation training component throughout so that eventually Yemeni should be comfortable conducting their own progress assessments. The plan also details the responsibility for evaluation implementation. Funding for the external evaluations, as shown in Annex I budget, totals \$174,150. In addition, in-country logistics support, such as typing, translation, and use of vehicles is included in the local currency budget.

II. BACKGROUND AND SETTING

A. Background

The YAR has attempted to meet some of its needs for trained agricultural personnel through foreign technicians either employed directly by the YARG or provided through donor assistance. The next step in the development of Yemen's agricultural institutions is the training of Yemeni technicians who can replace the foreign personnel and fill the even greater number of vital positions that have never been staffed. Ever larger numbers of Yemeni go abroad each year for bachelor degree training in agriculture. There are disadvantages in the present system in terms of overall costs, loss of foreign exchange, relevance of training, and return and retention of personnel. It is a natural and appropriate evolution to move towards development of an in-country agricultural training facility at the B.S. degree level.

The YARG believes that a FOA at the UOS should be developed to fill the gap of trained personnel in agriculture. During the past 2 years, the YAR has initiated comprehensive studies which would provide guidance concerning the appropriate type of facility and how the faculty should be organized. The YARG has requested USAID assistance in the process of planning and implementing a FOA, and USAID has indicated a willingness to participate.

The YARG issued Republican Decree No. 51 establishing the FOA on July 26, 1982 (see Annex D). It is important for the development of Yemen's agricultural potential that the FOA begin operation as soon as possible. Delays will increase the cost of construction, increase the cost of training Yemeni abroad, and decrease the rate of development in the agricultural sector.

B. Trained Manpower as a Constraint to Development

The need for appropriately trained indigenous manpower is apparent, as documented by the YARG and donor studies. The draft SFYP of the YARG states:

"Among the most crucial problems which hindered the implementation of the nation's Three Year Plan, then its First Five Year Plan, was the critical scarcity of technical and specialized skills, and the acute shortage of administrative and professional capabilities. This has caused dependencies on foreign skills. . . for the implementation of development projects and has resulted in (cost overruns) and in underutilization of capacities. . . . A priority is reducing the country's reliance on non-Yemeni personnel." 1/

A recent World Bank report echoes this concern:

"Inadequate supply of technical level cadre has actually been the most serious bottleneck to the implementation of the (development program) and stands to be even more serious in the SFYP." 2/

The recent USAID ASA verifies the impact of the shortage of university-trained administrators and professionals, and proposes that top priority be assigned to B.S. level education.

The problem is illustrated by the demand in donor projects for educated Yemeni counterparts to serve in line positions and as candidates for graduate education. Competition among donors for scarce Yemeni talent is high. For example, the recently proposed World Bank Agricultural Research and Development Authority Project (ARDA) has a requirement for 44 senior scientists at technical and administrative levels, 49 junior scientists, and 121 technical and administrative staff. While the World Bank is to provide graduate education for senior scientists, no baccalaureate or technical school education is planned. 3/ This situation is representative of the real dimensions of a very difficult problem.

The YARG believes that external training of Yemeni students and importation of expatriate technicians is but a temporary solution, and, as such, is insufficient and undesirable to continue. In the long-term, the YARG believes that establishment of a FOA at the UOS is the appropriate solution to one aspect of its manpower dilemma. The YARG has, therefore, requested USAID and other donor support in this endeavor. The USAID ASA strongly encouraged this decision by the YARG, and proposed that:

"While some of the necessary B.S. level education can be provided by training abroad, there is clearly a priority need for continuing agricultural education at the university level in Yemen that merits USAID attention." 4/

C. Relationship to Development Strategy

1. Conformance to the YARG Development Strategy

During the implementation of the YARG's FFYP from 1976/1977 through 1980/1981, the agricultural sector's average annual growth rate was less than 2 percent. The stagnation was due to several factors: lack of trained manpower, lack of irrigation, emigration of farm labor, product marketing, storage and distribution problems, and insufficient public support to the sector. During this period, due largely to absorptive capacity constraints caused by the lack of trained human resources, only 38 percent of the investment projects planned for the agricultural sector were carried out. In the education sector, significant expansion of education opportunity occurred with a total of all pre-university enrollments rising from 276,000 in 1976 to 453,000 in 1981; university enrollment increased from 2,300 to 4,200 during the same period.

Given the regional comparative advantages Yemen has for rain-fed and irrigated agriculture and the diversified employment opportunities available in Yemen in the last 8 years, it is clear to the YARG planners that increased productivity of labor in agriculture is requisite for economic growth. Transfer of technology, an improved human resource base and respons-

ible public institutions of research, extension, and credit receive high priority in the YARG's SFYP (SFYP, 1982/1986) for agricultural development. The CPO, UOS, -MAF, and MOE have agreed that creation of a university FOA, using a generalized U.S. land-grant model, is the best means to transfer technology, train technicians, and strengthen research and extension. Establishment of the FOA during the SFYP is one of the YARG's highest priorities. The Minister of Development, Minister of Agriculture and Fisheries, and the Prime Minister have strongly emphasized this priority in their discussions with USAID and other potential donors.

2. Relationship to USAID Development Strategy

USAID strategy in the YAR since 1978 has concentrated primarily on expanding the YAR's human capital, institution-building and technology transfer. The primary sectoral emphasis for these themes is agriculture and education. An extreme shortage of mid-upper level Yemeni technicians, managers, and researchers has retarded project/program implementation, hampered achievement of project goals, and, consequently, led to extension of project time frames and cost overruns. The YARG and other donors are equally aware of this manpower shortage. Institution building in Yemen requires both in-country primary and secondary education as well as technical and scientific education to produce the men and women who will be the catalysts, planners, and managers for the development process.

USAID assistance to establish a FOA at the UOS is a major element in both human resources and institutional development in Yemen. It complements other USAID projects which assist primary and secondary education, institution building in the MAF, horticultural and poultry development activities, and rural development projects. It also complements other donor projects which seek to expand the UOS during the SFYP through creation of Faculties of Engineering and Medicine and improving existing Faculties of Education and Science.

3. Relationship to the Agricultural Sector Assessment

The ASA recommended four strategy components for the USAID agricultural assistance program in the YAR. Listed in order of priority, they are:

- a. Assistance to education emphasizing first B.S. level and then secondary school level agricultural education;
- b. Assistance to expanding the institutional capability of the MAF to provide services to private farmers;
- c. Assistance to increase the capability of the MAF to undertake improvements which would increase the effective utilization of water supplies for irrigation; and

d. Assistance to promote private sector development.

Education is the highest priority because the major impediment to successful development activities is the lack of an effectively functioning work force in the public and private sectors. The top priority must be assigned to B.S.-level education for those who will provide education and training services to others in the agricultural sector. Agricultural education at the B.S.-level has the potential of producing graduates who cannot only educate and train others, but also provide the necessary administrative and management skills needed for the successful operation of schools or training institutions such as an extension service. It is these graduates who are needed to staff the scientific, technical, and administrative upper levels in public and private institutions and organizations, including the MAF. B.S. level personnel are also desperately needed to direct and implement development projects and provide suitable candidates for advanced degrees.

4. Relationship to the ADSP (279-0052).

A key objective of USAID/Yemen's development assistance program in the YAR is institutional development through human resource education and training. In the agricultural sector, this objective is being achieved by implementation of the ADSP under a long-term Title XII arrangement with the Consortium for International Development (CID). ADSP is a sector-wide program conducted in a collaborative mode which identifies, designs, and implements several subprojects in priority areas. The goal of the ADSP is to increase income and improve the quality of life of rural inhabitants. The purpose is to improve the capacity of the YARG and Yemen's agricultural producers to develop and sustain an agricultural sector which effectively and efficiently uses Yemeni natural resources, is integrated into the economy, and is supportive of broad based and equitable social and economic development. The thrust of the program and all of its subprojects is to support the establishment in the YARG of a strong institutional base that will facilitate accelerated agricultural development.

There are currently four ADSP subprojects in progress.

*Core

*Horticulture Improvement and Training (HITS)

*Poultry Extension and Training (PETS)

*Ibb Secondary Agricultural Institute (ISAI)

The Core Subproject is responsible for providing technical assistance and training to the central administration of the MAF in planning, policy analysis, design, implementation and evaluation of national agricultural development efforts. Core is also responsible for coordinating with the YARG in the development of additional subprojects and providing broad administrative and logistical support for their implementation.

The HITS and the PETS are expected to provide the MAF with an institutional capacity to support increasing fruit and poultry production and

protection services for rural producers through education, extension, and training.

The ISAI Subproject supports the education and training of mid-level agricultural technicians who will enter into public or private sector services, or who are eligible for university training in the agricultural sciences. This cadre will form an essential element that will contribute to agricultural development efforts in the YAR.

The proposed FOA Subproject will contribute directly to a major, end-of-project status (EOPS) of elements of the ADSP, namely "an agricultural education system identifying small farmer and rural population needs and capabilities, and providing responsive education and training. . . in technology, economics, and administrative skills."

The FOA Subproject will support and complement the MAF's program and other subprojects in the ADSP by:

- a. Producing graduates who will serve as managers and counterparts in the MAF and donor-sponsored projects and as candidates for participant training programs for graduate level study;
- b. Producing candidates for M.S. level training who will serve in a teacher or training capacity (multiplier effect) in agricultural, technical, and vocational schools and in the MAF/donor-sponsored development projects;
- c. Strengthening research on priority agricultural and rural development issues, including those being addressed by ADSP subprojects;
- d. Supporting those agencies that are active in developing and extending technology to private producers and cooperatives, including technology being developed in ADSP subprojects;
- e. Supporting growing needs for well-trained technical manpower in the private sector; and,
- f. Facilitating improved extension and demonstration linkages to local farmers and improved cultural practices on the instructional farm which will support activities of other USAID, MAF, and other donor projects.

5. The Agricultural Education Subsector

Another donor will provide funds for FOA building construction. USAID is the only donor considering providing technical assistance/training for the FOA.

As noted in a recent study:

"There are few opportunities to receive any education in agricultural subjects in the YAR. No agriculture is taught in the primary or regular secondary schools; nor is there an agricultural college at the university. There are only three technical agricultural schools within the YAR school system: The ISAI, the Surdud Secondary Agricultural School, and the Sanaa Veterinary Secondary School." 5/

The ISAI is a 3-year school (grades 10, 11, 12) with a functional capacity of 60 students per year and an actual enrollment of 52 students in its first (1982) graduating class. It is in its fourth year of technical training for agricultural extension agents and technicians. More academically oriented graduates can also pursue university-level agricultural studies.

The Surdud Secondary Agricultural School, modeled after the Ibb School, enrolled its first students in 1982 with financing from the International Bank for Reconstruction and Development (IBRD). Like Ibb, Surdud trains agricultural extension agents and technicians. It has a functional capacity of about 50 students per year.

The Sanaa Veterinary Secondary School, also financed by IBRD, initiated operations in 1981. It too has a functional capacity of about 50 students per year for a total of 150 students. The program emphasizes animal production and health courses. Graduates are projected to serve as animal husbandry/veterinary technicians.

In addition to long-term formal education, short-term training of 1 year or less is provided under various donor projects in extension, plant and animal production and protection, animal health, and agricultural modernization. They include the USAID-funded subprojects in the ADSP, the Southern Uplands Rural Development Project (SURDP), and the Tihama Development Authority (TDA) Project. These last two projects have trained between 250 and 280 agricultural extension agents since 1974. British sponsored projects have provided extension training in animal health and mechanics, producing about 180 trained Yemenis in the past 7 years. The British Agricultural Mechanics Training Project provided 2-week to 4-week courses for extension agents and rural mechanics. Generally, these donor projects provide training courses, but do not leave in place a permanent Yemeni capacity for skilled or semi-professional training.

III. DETAILED PROJECT DESCRIPTION

A. Purpose and Summary Components

The FOA is being proposed as a subproject of the ADSP (279-0052). The broad goal of the ADSP is "to increase rural incomes in the YAR through agricultural development." Each subproject contributes to the realization of this goal by supporting a more specific subgoal. The subgoal of the FOA Subproject is:

"To increase the supply of appropriately trained Yemeni men and women to plan, manage, implement and evaluate development activities in the private and public agricultural sector of the YAR."

Achieving the purpose of the FOA subproject is expected to have a significant impact on the above mentioned subgoal. The purpose of the FOA Subproject is:

"To support the establishment within the UOS of Yemen's first FOA which will be responsive to the YAR's agricultural development needs, is supportive of private and public sector development, and has appropriate linkages to the agricultural sector's production and institutional structure."

This purpose statement reflects the objectives of the FOA as jointly defined by the UOS, the MAF, and the MOE, and recommended by three donor agency studies.

The proposed subproject is expected to continue for 11 years, beginning in FY 1984. There are five major EOPS elements which should exist by FY 1994, the end of USAID's proposed contribution to the FOA. These are:

1. A functional, indigenous FOA, within the UOS, engaged in teaching and applied research and assisting the MAF extension activities;
2. Approximately 480 students educated and graduated at the baccalaureate level and assuming responsible technical and management positions in the public and private agricultural sector; and an established capability to produce 120 graduates per year;
3. Continuing collaboration between the FOA, the MAF, the MOE, private agencies, and agricultural producers on:
 - a. Research and research priorities;
 - b. Extension;
 - c. Curriculum development for baccalaureate level programs;

d. Other formal agricultural training programs (workshops, seminars, etc.); and

e. In-service training;

4. An operational instructional farm that is integrated into the curriculum, extension, and research functions of the FOA; and

5. A productive and ongoing relationship between the FOA and one or more U.S. agricultural university faculties of agriculture.

This subproject is clearly institution building by design, and has as a by-product of this focus the graduation of students educated in agricultural sciences. The primary concern is to institutionalize within the YAR a capacity to produce trained agricultural manpower at the B.S. level. Graduates constitute the major, but not the sole, *raison d'etre* for the FOA.

B. Broad Elements of the Development of the FOA

Table 3 summarizes the broad elements of the overall development of the FOA. It is proposed that USAID support to the FOA be provided in two major activities: (1) technical assistance, participant training, instructional farm development and building construction, limited classroom and laboratory materials and equipment, and library reference materials, and (2) architectural design services for the FOA, classrooms, library, laboratories, and office buildings, as well as engineering supervision of the construction process.

The faculty building construction, as outlined in Annex K, will be funded by other donors. The cost estimates reported Table 1a and in Annex I (Table I-1) include construction costs and room furnishings.

The YARG will provide land for the faculty building and the instructional farm, and will finance the local faculty and staff. Through the duration of the subproject, the YARG will gradually assume an increasing share of the recurring costs for the operation of the instructional farm as shown in Annex I (Table I-6).

TABLE 3
BROAD ELEMENTS OF THE DEVELOPMENT OF
THE FACULTY OF AGRICULTURE ^{1/}

AID SUBPROJECT		PARALLEL FINANCING OF OTHER DONORS	YARG
Institutional Development (Technical Assistance/Training)	Architectural and Engineering Services for the FOA Building		
1. Pre-Authorization Mobilization Activities in Training and Farm Development ----- 2. U.S. Technical Assistance 3. Participant Training 4. Instructional Farm Development and Building Construction 5. Instructional Greenhouse and Laboratory Development 6. Library Reference Materials	1. Preliminary FOA Building Design (including classroom, library, labs, offices) a. Prefeasibility Study b. Program of Requirements c. Site Inventory d. Schematic Design ----- 2. Final Design of FOA Buildings 3. Engineering Supervision of Construction Phase	----- 1. Construction of all FOA Buildings, except the Instructional Farm Buildings 2. Furnishings for Above	1. Pre-Subproject Planning Activities 2. Land for FOA and Farm ----- 3. Local Faculty and Staff 4. Operating Expenses (including utilities, local transportation, maintenance, repair, etc.) 5. Equipment Replacement

^{1/} Dashed line separates mobilization and implementation phases.

56

IV. PROJECT ANALYSIS

A. Technical Analysis

1. Manpower Assessment

Annex H contains a detailed discussion of the issues concerning professional and paraprofessional personnel in the YAR generally and in the agricultural sector specifically. The discussion here focuses largely on professional personnel issues. In the sense that trained (e.g., secondary school level) agriculturalists are candidates for university training at the FOA, these issues are discussed in the social soundness analysis. There is an important "requirements and training" issue regarding skilled or trained (sub-B.S. level) agriculturalists, but that is believed to be outside the scope of this SPP.

a. Requirements for B.S. level Agriculturalists and Economic Demand: The agricultural sector of the YAR needs the services and capability of a fully functional MAF staffed with university-trained personnel, preferably Yemeni nationals. Without a professional staff trained to (at least) the B.S. degree level in general agriculture or a specialized agricultural discipline, combined with managerial training as appropriate, the fully effective functioning of this agency may not be achievable. Projections of professional level manpower needs in the MAF have been prepared as a consequence of the FFYP and SFYP. These needs are more related to filling technical requirements of donor-assisted projects (which call for Yemeni counterparts) than to strengthening the current on-line functioning capability of the MAF. In this context, the requirement estimates are justified. The MAF probably needs 300 B.S. level graduates just to fulfill the needs of the FFYP which ended in December 1981. By 1986 (end of SFYP), there is a stated need for 600 more graduates. To place these projections in perspective, there are (in November 1983) about 200 B.S. level (or higher) professionals in the MAF (or affiliated with the MAF) of whom no more than 50 are Yemeni nationals.

Although there is no questioning of need in general, it is necessary to examine the economic and other forces which have operated on the "needs fulfillment" process at the MAF. This is necessary because the MAF has been coordinating a training program (with donor assistance) since 1974 aimed at supplying a stream of B.S. level cadre to its ranks. For the number of graduates presumed to emerge from these programs in the first 3 "end of pipeline" years, the apparent retention rate (15 percent) has been disappointing. In Annex H, reasons for this low retention rate are explored. There is reason to believe that economic incentives are only partially

involved. Other reasons, such as the lack of a defined career structure at the MAF, for example, could be very important. The SPP team was unable to gain much comprehensive, quantitative information about response of B.S. level graduates to general economic incentives (and in agriculture, specifically). Private sector opportunities are abundant in commerce and (to a lesser extent) industry. Monthly salary differentials are striking, perhaps 50 to 100 percent greater in commercial firms than in the MAF positions. These differentials must be balanced against employment perquisites, not the least of which is greater job security in the YAR Civil Service. Although the redirection of B.S. level agriculturalists into the private sector is to some extent unavoidable, the redirection of specialists to other ministries should be the cause of some concern since some professionals in this category are willingly accepting salary decreases in order to do so.

The potential for new B.S. level agriculturalists to join private sector agribusiness appears to be limited at least in the near term. The (very) small scale of farming operations now in existence and the improbability for the establishment of large farms lies at the heart of this observation. Exceptions exist in some poultry enterprises, the few horticultural operations and perhaps food processing/food marketing firms. Firms which supply inputs to agriculture are reported to have not gained enough size or experience to warrant the hiring of technical staff as is common in the United States.

b. Supply of Professional and Paraprofessional Workers for the Agricultural Sector: Economic and Other Determinants of Career Choice: One objective of the (professional) manpower assessment was to determine the responsiveness of educated Yemeni to economic incentives and other non-pecuniary rewards (or disincentives) in the matter of career choice. Although the SPP lacked the time and resources to conduct any thorough investigation, the observations of several interviewees in the MAF, UOS, and the mixed public and private sector in agriculture led to some initial conclusions about the supply of professional and paraprofessional workers in agriculture. Individuals at these training/ability levels appear to be significantly responsive to economic incentives. This is especially true in commerce where it is observed, for example, that many students at UOS secure part-time employment in business firms for the sake of gaining experience and immediate income. As a result, B.S. level programs in the Faculty of Commerce have sometimes been stretched out to seven or more years. In the MAF, for instance, it is not uncommon to encounter career professionals who have opted for

training in agriculture simply due to scholarship availability.

This is not to suggest, however, that non-pecuniary factors are unimportant in career choice. Agriculture is perceived by most respondents as being important to Yemen. Agriculture is also perceived as an area where foreign donors are involved, an incentive for those making a career choice since opportunities for advanced level training abroad are likely to exist in such situations. Perceptions about disincentives involved in a professional career in agriculture, especially in the MAF, do exist among professional staff in the YARG ministries. As mentioned above (career structure, job satisfaction, etc.), these factors do affect professional recruitment, especially in the MAF. How much these factors affect the supply of graduates for the MAF can only be guessed at. Indications are that there is a considerable exchange of such information among agriculture students (even those studying abroad) about the advantages of certain kinds of jobs in the YAR, and especially the MAF. In spite of faint signs of dissatisfaction with careers at the MAF, no respondent would agree with the statement that the MAF was viewed as the last resort for employment. Perceptions of agriculture as a professional career by secondary school graduates are probably not well formulated by students at that stage. However, observations by instructors at ISAI were that it is difficult to dislodge a negative stigma concerning work in practical aspects of agriculture. Early indications are that most of these students who are on an "agriculture track" at the secondary school level will opt for B.S. level training.

c. Conclusions: There is a justifiable need for training B.S. level agriculturalists for service in the YAR generally and the MAF in particular. The number of Yemeni in professional level positions at the MAF, related ministries, and the mixed public sector and private enterprise firms is markedly low. There appear to be no serious obstacles to supplying B.S. level agriculturalists to the YAR and to the MAF in particular. The economic incentives are no less attractive in the MAF than in other ministries. The need for graduates in purely agricultural jobs in the mixed public sector and private enterprise firms is observed to be limited at the present time. There appears to be a good match between needs and potential supply from the point of view of the viability of the FOA. However, there is a need to continue to monitor the process of "needs fulfillment" in relevant agencies and firms concerning professional and paraprofessional agriculturalists in the YAR. The FOA Subproject should include ongoing evaluation of how well the

MAF, related agencies, and mixed public sector and private enterprise recruit, develop career structures for, manage, and most important, retain their incoming professional and paraprofessional personnel.

2. The Project

The YAR opened its doors to the outside world in the early 1970's. Increasingly, the villages are looking to the government for access to public goods in return for taxes. 6/ The YAR has undergone profound and fundamental political, economic, and social changes which established the foundations of a modern state during the 1970's. Key economic factors have been the massive outflow of labor to neighboring oil producing countries, remittances which have triggered significant private investment back into the predominantly agrarian economy, increased demand for food and consumer goods, massive inflows of donor aid, weak absorptive capacity, and limited central government planning activities. 7/, 8/

Ninety percent of the YAR's population lives in rural areas and has traditionally been involved in some aspect of agricultural production. Labor outmigration has placed severe stress upon maintaining agricultural production. Shortage of skilled manpower is an overriding constraint to development as skilled manpower is drawn from a labor pool with very limited education and no modern agricultural training. 9/

The foundations of the country's physical and social infrastructure were laid by the YARG's First Three Year Development Program in 1973-76 and the First Five Year Plan (FFYP) in 1976-81. Both plans placed primary emphasis upon (1) building institutions for agricultural and rural development and (2) building a public school system which provides free country-wide primary and secondary education.

No agricultural institutions existed prior to 1970. The MAF was organized in 1970. Agricultural research independent of the MAF was initiated in 1973 with the establishment of a Central Agricultural Research Service (CARS) in Taiz in the Southern Uplands region with support from the United Nations Development Program (UNDP)/Food and Agriculture Organization of the United Nations (FAO). Research continued to expand with an increasing number of commodity-oriented bilateral assistance projects. All research projects to date have been conducted independently with little regard to overall coordination. The National Extension Service (NES) was added to the MAF during the FFYP. It has operated almost entirely on a regional basis. The extension agents in regional and central the MAF offices are funded by the MAF. Agents working out of regional development offices are funded by outside donors.

Plans have been developed, but not yet approved, to reorganize the MAF research activities as outlined by a World Bank loan proposal. The plan calls for all agricultural research in the YARG to be supervised and coordinated by an ARDA, with establishment of ARDA Headquarters and the

Central Highland Regional Research Center (RRC) in the Dhamar area, the Tropical Lowland RRC in Surdud, and the Southern Uplands RRC at the CARS site in Taiz. The ARDA plan, if implemented, is expected to provide national coordination for all agricultural research and research sites for each of the YAR's three major ecological zones.

There are limited opportunities to receive training in agricultural subjects in the YAR. No agriculture is taught in the primary schools nor the regular secondary schools. There are only three secondary agricultural technical schools in the YAR. Each provides 3 years formal technical training beyond the ninth grade, culminating in a technical school diploma (see Section IV.B. and Annex F). All secondary schools are administered by the MOE. The agricultural secondary schools are to supply the technical level manpower needs of the country, including NES (see Annex F for details). The agricultural secondary schools are also a potential source of students for the FOA (see Section IV.B.3 and Annex F). Short-term in-service agricultural technical training is being provided by various donor sponsored projects, including CARS, the British Veterinary Services Project, the British Agricultural Engineering Project, and USAID's horticulture and poultry projects.

There is one university in the YAR, the UOS, and it contains seven faculties: Arts, Law, Education, Science, Commerce and Economics, Medicine, and Engineering. Veterinary Medicine, Agriculture, Dentistry, and Pharmacy are planned. A priority goal for the FOA is to train agricultural B.S. graduates to:

- *Staff the MOE and the MAF in technical, professional, and administrative roles;
- *Staff some 56 on-going donor supported agricultural and rural development projects;
- *Provide personnel for the emerging agri-business sector;
- *Collaborate in the development and staffing of a national agricultural extension service; and
- *Provide technical expertise for numerous local development authorities (LDA).

In addition to the training of B.S. graduates, the FOA will be an integral component of the YAR agricultural research capability and will be involved in the training and upgrading of agricultural personnel in the NES and regional LDAs. These relationships (linkages) are outlined and defined in Annex E, pp E-12 to E-18.

a. Faculty Development

- (1) Technical Support: An integrated system of initial and ongoing technical support is proposed to the FOA as

part of this 11-year development process. This support has four major components:

(a) Provision of a FOA Advisor, a TL/Subproject Manager, a co-manager of the instructional farm, and a co-librarian during the initial 5 years of the institution's development and expatriate faculty members during the time Yemeni faculty are receiving international training to prepare them for specific faculty assignments. The scheduling of this support is detailed in Annex E, and reflected in the annual budget presentation, Annex I;

(b) Training of Yemeni faculty members (see paragraph which follows);

(c) Establishment of long-term collegial relationships between individual faculty members of the FOA and specific U.S. agricultural university faculty members. This relationship is funded through temporary duty (TDY) support through project year 7 and is described in detail in Annex E;

(d) Provision of an on-going program of faculty development in the form of TDY personnel who will bring particular expertise as needed to enhance the teaching, research, and/or extension capabilities of the faculty. A total of 4.7 person years of TDY support is provided in the subproject budget (Annex I).

(2) Training Requirement: The sub-project provides for the training of 22 Yemeni faculty members during the development phase of the FOA. In addition to these, seven participants were identified as of November 1983 and have been approved for U.S. graduate training. The 22 persons identified for doctoral level training will be distributed in academic fields as follows:

ACADEMIC FIELD	Number
Agricultural Economics	2
Agricultural Engineering	4
Extension Methods	2
Agricultural Education	1
Animal Science	2
Crop Science	2
Foods and Nutrition	1
Food Science and Technology	2

Horticulture	1
Poultry Science	2
Rangeland Resources	1
Soil Science	2
Subtotal	22
Participants already in training	7
Total	29

In addition to the 29 persons to receive doctoral level training, shorter-term training is specified for the FOA Dean, Instructional Farm Manager, ESL/Technical Specialist, and Librarian. For the latter two, postbaccalaureate or master's-degrees are anticipated. Every effort is planned to recruit one or more women to be included among the trainees for faculty positions. The schedule for these training activities is detailed in Annex E, Table E-1, and reflected in the detailed budget (Annex I).

(3) Laboratory Development: Access to laboratory facilities has been identified as a major need of secondary school graduates in the YAR. Included in the preliminary facility design are 4,810 square meters of laboratory space, distributed as follows:

Use	Space, sq m
Plant science laboratories	400
Soil science laboratories	290
Animal and poultry science laboratories	385
Food science laboratories	270
Basic science laboratories	720
Animal and poultry nutrition laboratories	250
General teaching laboratories	240
Computer instruction	100
Agricultural mechanics space	1,200
Greenhouses	500
Support space	455
TOTAL	4,810

The building budget further includes provision for furnishings. The details of laboratory space are included in Annex K.

This laboratory space represents 49 percent of the total space planned for the FOA. This is considered to be an adequate allocation of laboratory space to provide a quality educational experience for B.S. students in agriculture.

(4) Technical Reference Materials: Plans for the FOA facility include 200 square meters of space allocated to a library (Annex K). A separate library was selected for the FOA rather than (a) integrate agricultural reference materials into the university library system or (b) develop a system whereby the FOA and the MAF share reference materials and facilities that would be provided in the USAID-funded DLRC for the MAF. This proposal for a separate FOA library is consistent with the experience of other UOS faculties, and has resulted from the limited facilities of the central university library.

The FOA library is designed similar to those on most university campuses in the U.S. Its major clientele will be the students and the Faculties of Agriculture, Science, and Commerce. The students and faculty will use the library for the preparation of term papers, research papers, extension information, and general classroom and laboratory use. The FOA library will be a teaching/academic research facility containing reference materials, journals, books, and relevant periodicals for students.

The DLRC at the MAF will be used primarily by the MAF and other the YARG ministry personnel, foreign technicians, and project design teams. The documents that are to be housed in the DLRC will be government documents, records, project feasibility studies, research reports, general agriculture texts, and reference books. The DLRC will have the capacity to generate large amounts of government statistics that will be used by the YARG to develop policies in agricultural planning, marketing, crop development, census, etc. Additionally, the DLRC will have the capacity to duplicate large volumes of material that will be used by constituents of the agricultural sector.

Clearly, the FOA library differs from the DLRC in location, clientele and purpose. The FOA library will operate as a lending library mainly for student use. The DLRC will be a repository for single copies of reports and reference documents (not books) which can be read and desired portions copied. The DLRC will not

loan materials. Combining the two facilities, either physical or administrative, would weaken both entities. Since they are key units whose functions are critical to the development of their respective institutions and economics of scale are limited at best, the USAID/Y does not recommend attempting to service both functions with one facility.

It is planned that one co-librarian will assist in the establishment of the FOA library. This FOA library advisor will coordinate efforts with the DLRC to share information and materials that will enhance the quality of both facilities.

Until appropriate Yemeni staff are trained and in place, the DLRC proposes to have two technical assistance positions for long-term personnel and the FOA library will have one position. The DLRC advisor will supervise establishment of the DLRC building and its information retrieval systems and search the country for reports to put into the DLRC. The DLRC reference specialist will perform the tasks of a librarian in the DLRC facility and train a Yemeni counterpart to do the same. The FOA library advisor will establish with a Yemeni counterpart the FOA library and its systems for purchasing, cataloging, storing, and lending books to students.

(5) Commodity Support: Commodity support is essential to the successful operation of the FOA. Within the budget (Annex I) are the following commodities schedules at the appropriate times in the life of the subproject.

Non-Expendable Equipment and Materials

Teaching materials	\$ 57,000
Library resources	305,000
Teaching equipment	304,000
Office equipment	220,000
Misc. equipment	60,000
Vehicles	75,000
TOTAL	\$1,021,000

Expendable Equipment and Materials

Office supplies	\$127,000
Teaching materials	11,000

Vehicle & equipment parts	32,000
Miscellaneous	33,000
TOTAL	\$203,000

The above listed commodities are considered supplemental to those included in the faculty building construction budget. The equipment included in the building budget will include such items as desks, chairs, limited filing cabinets, tables and certain laboratory and shop equipment. The commodities included in the USAID budget are considered to be of the following types:

Non-Expendable Equipment and Materials

Teaching materials: slide sets, movie films, overhead transparencies, cassette tapes, and computer software.

Library resources: reference volumes, handbooks supplemental texts, journal subscriptions, and equipment catalogs.

Teaching equipment: slide projectors, movie projectors, overhead projectors, projection screens, demonstration units, and small equipment such as wires, pumps, monometers, plows, and example irrigation sprinkler nozzles.

Office equipment: word processing equipment, typewriters, calculators, dictating equipment, copying machines, and desk lamps.

Vehicles: automobiles, pick-ups, and student transport vans.

Misc. equipment: supplemental items such as cut-away engines, hand tools, and microscopes.

Expendable Equipment and Materials

Office Supplies: papers, pens, chalk, copying supplies, typewriter ribbons, stationery, and file folders.

Teaching materials: computer paper, overhead transparencies, charts, copy paper, handouts, video tape blanks, steel, lumber, cement, and other laboratory supplies.

66

Vehicle equipment parts: tires, fan belts, saw blades, pump seals, and other commonly consumed and repair items.

Misc.: service agreements, repair bills, paint, and essential maintenance items.

b. Instructional Farm

The FOA Project Planning Design Team and the UOS administration have determined that an instructional farm should be designed to serve the FOA. A CID team planned the instructional farm. The farm should be used mainly for instruction and demonstration of existing technology. It will also serve research needs of the FOA and allow on-campus extension-type training.

The instructional farm will be located on the new campus of the UOS at the intersection of Ring Road and Wadi Dhar Road. Up to 22 hectares are available for the farm. The farm should serve the needs of the disciplines planned for the FOA: agronomy, horticulture, irrigation and mechanization, and animal and poultry science. Details of the instructional farm are shown in Annex J.

In general, the instructional activities should represent as much diversity as possible. The climatic conditions of the YAR are diverse; thus, local conditions pose some limitations since Sanaa is on a high mountain plain. Most of the demonstrations should have widespread, immediate application. The physical and economic resources available to the farmers should be considered in designing demonstrations.

An instructional farm cannot totally represent the diversified agriculture of the entire country. A network of demonstration and research farms throughout the YAR is planned for the future. The planned demonstrations on the Sanaa campus should show optimum and sub-optimum irrigation and rainfed agriculture.

The students of the FOA need "hands-on" exposure to the technology of modern agriculture. The background of most students will not be in modern agriculture. Eventually, as many as 300-400 students will need access to the farm each year. They will complete many of the practicums themselves, providing much of the labor. Most of the demonstrations should have immediate practical significance so that the students can carry the knowledge to the farmer for direct application. Some of the demonstrations, however, will

introduce new concepts not immediately acceptable to the producer. Some demonstrations will show problem situations. As far as possible, all crop and horticultural commodities produced in the YAR should be demonstrated.

(1) Early Development Activities: The FOA tentatively plans to enroll its first class of students in September 1986. The current plan is for the first year of the curriculum to be in the existing FOS (see Annex E). The remaining years (Years 2-4) of study will be in the FOA. The first year of actual instruction on the new FOA campus, therefore, will begin in September 1987. In order to meet this projected schedule, the UOS is negotiating now to have the FOA buildings and instructional farm completed and operational by September 1987.

Concerning the instructional farm, it is critical to have it operational at least 1 year prior to its opening for student training. This will provide farm management personnel the necessary time to establish systems of operation and coordination with the Yemeni and expatriate teaching faculty. It will also provide the faculty members the necessary time to plan the on-farm elements of their courses and to initiate limited research activities. All of the above should be started no later than September 1986 and be well under-way prior to the arrival of students during the summer practicum of 1987.

The Technical Analysis (Annex E of the SPP) concludes that, starting from ground zero, approximately 2 years will be required for the development of the farm. Considering CID's experience in Yemen with HITS and PETS, this is a very realistic estimate.

Should this schedule not be followed, the instructional farm would not be completed by September 1986, and, most likely, will not have had sufficient time to become operational by September 1987 when the second year students arrive on the FOA campus. Moreover, the faculty members will not have the necessary time to become familiar with the farm before starting classes in September 1987. This would lead to an untenable situation in which a significant portion of the training for the first group of students is void of practical experiences on campus. The vacation practicums could possibly off-set this undesirable situation to some extent. However, even student performance in these field practicums would most likely

be marginal without the critical on-campus experience that an instructional farm could provide. A further important consideration in this regard is the possibility of establishing a precedent of having a first class which, in effect, misses a large and necessary part of the curriculum.

The budget for the first project year of the instructional farm has been based on the study by Vomocil, et. al. (Annex J). A number of the estimates were spot-checked by referring to the worksheets which are available at CID/Sanaa and by using other available information. The study cost estimates have been escalated to the time of anticipated construction by using an inflation factor of 10 percent compounded over the two-year period that has elapsed since the original estimates were generated. In some instances, the estimates have been revised based on revised expectations in terms of the use of certain facilities.

The technical information in the draft study is sufficient to proceed with the design of the eight farm buildings, the layout and design of the farm plots, the fencing, the gravel roads, and the on-farm water distribution system.

The Core Subproject's engineering technician at the CID/Sanaa will prepare a topographical survey of the area for the proposed instructional farm, with the help of a local survey crew. The survey data will be submitted to CID offices at OSU where CID agronomists, animal and poultry scientists, and engineers will lay out the farm plots and prepare preliminary specifications for leveling, grading, and roads and for the purchase of fencing and other equipment. They will also prepare scopes of work and contract documents for the construction contract and requests for proposals for the A/E contract for the design of the buildings.

(2) Technical Support: The technical support provided to the instructional farm is similar in character to that provided the overall FOA. Initial expatriate input to the farm will include provision of a farm co-manager for a period of 5 years while operating procedures are being formulated. In addition, FOA expatriate faculty will be closely involved with planning the day-to-day operation of the instructional farm, conducting classroom practicums and workshops, and training the MAF personnel and other agricultural development leaders. Additional support is also

included in the development of the instructional farm in terms of engineering design and construction supervision. Further details on the technical support related to this facility are included in Annexes E, I, and J.

(3) Training Requirements: Training requirements for the instructional farm are closely related to those of the FOA since the faculty members are directly involved in operations and utilization of the farm. In addition, a farm manager is scheduled for training in the U.S. to become familiar with effective experimental/instructional farm operation.

(4) Facility Construction: Construction of the instructional farm is scheduled to commence in Year 1 of the subproject with detailed engineering design, site development (surveying, leveling, grading, and road construction), installation of the perimeter fencing, installation of the on-farm water distribution system, and provision of water to the site (drilling of the well and installation of the supply line from the well to the farm site).

Construction of the instructional farm is scheduled for completion during the second year of the project. This will include constructing and equipping the crop science field laboratory, livestock field laboratory, poultry field laboratory, and the farm shop. Once these construction projects have been completed, the facility will be available for agricultural development (see Implementation Schedule, Annex M, and Figure 2, pp 49 and 50 of text).

(5) Water Delivery: Preliminary engineering evaluation has been completed and a general scheme selected for providing water to the instructional farm. The system includes drilling two wells, the first to be funded by USAID, the second by the UOS, approximately 3 kilometers west of the farm site, installation of submersible turbine pumps and a 30 cm pipeline from the well site to the farm, and an on-farm plastic lined water storage reservoir with a capacity of 1,500 cubic meters.

Within the boundary of the instructional farm, the water delivery system will consist of an integrated network of main lines, sub-mains, concrete lined channels, an elevated water storage tank, and the associated drop structures, standpipes, and pipeline

fittings. This system is scheduled for installation during the first year of the project. Complete details are provided in Annex J.

The water delivery system is specifically planned to provide a full range of irrigation possibilities within the farm. Full development is dependent upon having a sufficiently productive well system to provide a firm water supply of 15 to 20 liters/second at maximum capacity.

(6) Integration into Curriculum: The instructional farm is planned as an integral and essential aspect of the FOA teaching program. It will be the site of numerous demonstrations as the faculty strive to relate their theoretical teachings to the physical realities of agriculture in the YAR. Annex E includes a presentation of competencies to be mastered by the students. This skill development will occur on the instructional farm.

Many of the students will arrive at the FOA with limited agricultural experience. For this reason, the students will be directed to the instructional farm on a regular basis for equipment, plant, animal, and practice identification. As part of their educational program, the students will be responsible for performing a significant portion of the agricultural operations to develop their skills and to provide them an opportunity to use the extensive variety of agricultural implements provided on this farm.

(7) Demonstration and Community Outreach Programs: The instructional farm will be used extensively for demonstrations, workshops, and short-term training courses. Although most of these educational efforts will be provided by the agricultural faculty, the facility may also be used by the MAF personnel, under FOA supervision, and other agricultural experts including TDY expatriate faculty members with particular areas of expertise. The instructional farm setting will be an appropriate learning site for extension, local development association, and regional development authority personnel. Further insights into the use of this facility to promote technology application to individual farming operations can be seen by reference to the linkage discussions in Annex E.

(8) Faculty Research Activities: The instructional farm has been designed to facilitate initiation of

faculty research in addition to item (7) above. Although the priority use of the farm is for student training and competency development, the other uses are not conflicting.

Although a variety of research activities are possible, the following potential list are indicative of the types of research possible.

- (a) Evaluation of alternate feed materials
- (b) Plant variety evaluations
- (c) Pesticide evaluations
- (d) Water use efficiency testing
- (e) Seeding density evaluations
- (f) Effect of alternate tillage practices
- (g) Fertilization trials
- (h) Alternate crop testing
- (i) Product storage trials
- (j) Solar energy demonstrations
- (k) Evaluation of multiple cropping techniques
- (l) Use of artificial light for egg production

The budgeting process for the instructional farm makes faculty research particularly attractive. There are already sufficient personnel included in the farm budget to conduct the appropriate trials. In addition, there are sufficient operating funds provided in the budget to allow these activities to proceed. Students may also be productively involved in these activities to enhance their educational programs.

c. Curriculum and Practicum Experiences Curriculum

(1) Curriculum: A proposed curriculum in general agriculture is shown in detail in Annex E, Table E-4. This curriculum is based on the UOS requirements of 144 semester credit hours for a B.S. degree. To meet the UOS requirements, a student must complete 36 credit hours for each school year. The UOS requirement of 15 credit hours in Arabic, English, and Islamic Civilization are included in the proposed curriculum.

The general agriculture curriculum is designed with a first year program in the basic sciences such as chemistry, botany, zoology, mathematics, and physics. The basic science courses will be taught in the FOS. All basic science courses are currently being taught at the UOS. The proposed curriculum follows the existing credit patterns of the FOS.

The SPP team is cognizant of the need for strengthening the basic science component of the curriculum. For example, a course in organic chemistry is needed at the second year level. In achieving a balance of basic sciences and technical agriculture classes, it was necessary to eliminate several needed courses from the curriculum to maintain student classloads at 18 credits per semester. The Dean and the FOA Advisor must have some latitude in modifying the curriculum to achieve the appropriate balance of staff expertise, subject matter, and learning activities.

Technical agriculture classes were designed for the following emphasis areas:

- Agricultural Economics
- Animal and Poultry Science
- Plant and Soil Science
- Agricultural Engineering
- Horticulture
- Pasture and Rangeland Management
- Food Technology
- Plant Pathology and Entomology
- Extension Methods

Each of the areas of emphasis is significant to the development of agriculture in the YAR. The general agriculture curriculum includes a series of courses that will prepare students in each of the emphasis areas to a degree that will allow them to enter specialization programs in the emphasis area of their choice. The program emphasis areas and related courses are shown in Annex E.

The proposed curriculum is a model curriculum for general agriculture. It does not allow for electives or program options. As the FOA evolves and matures, elective courses can be added to the program emphasis areas. The curriculum can be moved toward specialization and program options as staff expertise becomes available to the FOA. A tight curriculum, without electives and program options, will help to assure that a solid program in general agriculture is established. The evolution of electives, program options, and advanced degree programs will be a natural extension of the basic curriculum.

The proposed curriculum is targeted toward the needs of the rural farmer in the YAR. Although public

and private agencies will employ FOA graduates, the curriculum must be directed at the needs of the rural society that is being served by those agencies rather than agency needs. The proposed courses are purposely skewed toward applications and practicums that are needed by working agriculturalists.

This curriculum provides a theoretical base that will allow FOA graduates to pursue graduate programs in any of the major options in agriculture. At the same time the graduate is prepared as a well-rounded agriculturalist who can work in a variety of job settings. Specialization of curriculum should be deliberately avoided during the early phases of FOA implementation. Program options should be an outgrowth of a maturing program as departments become organized and Yemeni staff are available.

The curriculum is dynamic in nature. It must be continually updated to keep abreast of technology. The proposed curriculum should be fully reviewed prior to its implementation in the FOA. Minor adjustments and modifications in course requirements, course content, and scheduling of classes will be a responsibility of the FOA Dean. The general pattern of the curriculum must be maintained to mesh with the training and staffing schedules of this subproject.

(2) Practicums: In addition to the basic coursework, three vacation practicums have been proposed to assure that students get "hands on" training in agriculture. A description of the vacation practicums are found in Annex E. The practicums are designed to give students involvement in agriculture in the different regions of Yemen, in practical skills on the instructional farm, and in a practical work experience in a productive agricultural setting.

(3) Competencies: A list of skills or competencies has been suggested for each of the program emphasis areas. The competency lists are performance indicators to measure a student's ability to do the basic skills of agriculture. The instructional farm is designed to help students achieve competence through "hands on" instruction. The competency lists will be further refined by faculty members to reflect better the needs of Yemeni agriculture. A competency checklist will be used to enhance classroom instruction in technical agriculture. Examples of competency checklists are included in Annex E, pp. E-32 to E-35.

(4) Secondary Teacher Preparation: An advanced degree (M.S.) is currently being required for teaching in an agricultural technical school. With such requirements in place, it does not seem reasonable to include a teacher preparation component in the B.S. program in general agriculture. Teacher preparation training is proposed as an additional 18-week program beyond the completion of a B.S. degree. This important component will evolve as agriculture programs are implemented in the secondary schools of Yemen. A proposed curriculum for agricultural teacher preparation is included in Annex E.

(5) Student Workload: The proposed curriculum of 144 semester credit hours will require the student to complete 18 hours during each of eight semesters. Additional credits will be obtained through vacation practicums. The student workload is a full one, as necessitated by the 144 credit requirements of the UOS. Some students may require an additional semester or year to complete the degree requirements.

(6) Faculty Workload: The faculty work loads were computed to allow time for extension and research development. Also, the current workload standards of the UOS were observed in calculating the staff required to teach the proposed curriculum. Annex E, Table E-6, contains the faculty workloads in relationship to the curriculum and staff responsibilities for research and extension.

(7) English Language Proficiency: Some of the students in the FOA should obtain a level of English proficiency that will allow them to pursue advanced degree programs in English speaking universities. The first 2 years of the FOA curriculum requires students to take formal English classes. A continuum of English instruction is proposed for the third and fourth year through further elective classes and through infusion into the technical classes. A conceptual model of ESL training is shown in Annex E, Table E-5.

d. Evolution of Organizational & Administrative Structure: The evolution of organizational and administrative structure is described in detail in Annex E, Section C. In accordance with the recommendation of the Faculty of Agriculture Planning Unit (FAPU), the land-grant model will serve as a guide to shaping the structure of the FOA. Initially, resident instruction will be the primary function

of the FOA.. There will be a nondepartmentalized structure with the only administrator being the dean who will be responsible through the Vice Rector to the Rector of UOS.

As the FOA grows, departmental units will eventually emerge. These departments would be agricultural economics, agricultural and extension education, agricultural engineering, crop production and protection, food science and technology, and livestock and poultry production and protection. Managed by department heads, these departments would operate expanded and more sophisticated programs of teaching where students could option for greater specialization at the baccalaureate level.

The long-range organizational structure envisions the dean, assisted by three associate deans, responsible for leadership in teaching, research, and extension. Faculty members in each department would participate in all three activities, some holding joint appointments in at least two areas. In addition, it is anticipated that FOA members will hold joint appointments with the MAF while courtesy appointments to the FOA may be extended to appropriate staff of the MAF and MOE. In essence, this is the generalized land-grant model and it may take 15 to 20 years to achieve this goal in the YAR.

In order for the FOA to perform well, the activities of teaching, research, and extension, institutional linkages must be established and nurtured. These linkages, administrative and operative, are illustrated and described in detail in Annex E, Section E. The UOS, MOE, and MAF have been highly supportive of and involved in the proposal to establish the FOA. Therefore, willingness on the part of those institutions to develop and strengthen linkages can be expected.

3. A/E Services for the FOA and Instructional Farm Buildings.

The subproject includes USAID-funded provisions for the professional services of a selected A/E firm to design and supervise the construction of the FOA and instructional farm building. Preliminary A/E activities contracted by USAID in January 1983 resulted in a Prefeasibility Study for the faculty buildings (see Annex K). This document was approved by USAID/Washington in August 1983 and is now being used as a document to help attract other donors to finance the construction of the FOA building. Cost estimates from that study are included in Annex I, Table I-1, as "other donor parallel financing." The Prefeasibility Report details a building of approximately 14,000 square meters at a cost of roughly \$22 million, including furnishings, basic equipment, and contingencies.

Annex L documents the A/E Scope of Work (SOW) for A/E Services as prepared by Gauthier, Alvarado and Associates, the U.S. A/E firm that was contracted by USAID to complete the Prefeasibility Study. It details a phasing plan for the A/E services and cost estimates totalling \$1.7 million, which has also been built into the budget estimates in Annex I.

More recent estimates by USAID/W have increased the initial estimates somewhat. Some items were omitted (interest during construction) and others were appropriately increased (contingencies and price escalation factors). A detailed breakdown of construction, site development, and A/E design and construction supervision costs for the FOA and Instructional Farm buildings are itemized in Table 1a, p 5.

4. YARG Contribution to Project Development

Table 3 itemizes the YARG inputs prior to the initiation and through the duration of this subproject. Pre-subproject activities beginning in 1980 and continuing since that time have included a number of outside donor studies. Some of these were sponsored by USAID. The YARG issued the official Republican Decree No. 51 (see Annex D) on July 26, 1981, officially establishing a FOA.

Land for construction of the FOA building and development of the instructional farm was designated on the new UOS campus in late 1982. This land, estimated at 25 hectares, has been valued at \$12.4 million, as indicated in the YARG cost estimates (see Annex I), and the Summary Financial Plan (see Table 6, Section IV.D 70).

In addition, the YARG and UOS officials have acknowledged their obligation to assume the gradually increasing recurring costs (local faculty and staff operating expenses and equipment replacement) that are inherent in this institution building subproject. Through the life of project, these obligations total \$31.6 million, including contingencies and inflation (see Table 6, Section IV.D. 70). Given the outstanding growth and achievement record of the UOS and its progressive plans to expand in other vital areas, there is every reason to have confidence in the institution's commitment to the FOA. Section IV.E. summarizes a detailed institutional analysis of the UOS and its capability for continued program development.

5. Construction of Instructional Facilities:

A prefeasibility report on facilities, other than those on the instructional farm, is included as Annex K. A brief summary of that report follows. The facilities proposed were based upon an anticipated enrollment of 600 students--20 percent females, 80 percent males--in a 4 year academic program which may eventually include six agricultural disciplines. The amount and type of space provides for research and extension activities as well as teaching.

The facilities comprise 14,000 square meters of classrooms, teaching and research laboratories, offices, auditorium, prayer rooms, library, and snack bar. The library space was included because UOS policy is to have one main library and a satellite library in each of the faculties. Approximate cost of the construction was projected at \$19 million and furniture and equipment costs were projected at \$3 million. Total time for planning, design, bid letting, contract awarding, and construction will be 4 years.

Details of construction supervision services for the facilities are presented in Annex K (p. 13-19). USAID/Yemen proposes that USAID fund the construction supervision services. The cost for these services is now projected to be about \$413,500.

6. Institutional Development

a. Technical Assistance: Table 4 summarizes the person-year inputs throughout the subproject. Technical assistance will be provided in two categories: on-campus (U.S. lead university) subproject management and in-country subproject management.

(1) On-Campus Subproject Management. Figure 1 provides a preliminary organizational scheme for the FOA Subproject administration and technical assistance, and indicates how subproject personnel will link with appropriate counterparts within the UOS. Recent discussions between USAID/Y and CID have attempted to clarify subproject management schemes with in-country CID Core and USAID/Y personnel. Some modification of the following may be necessary as administrative roles are clarified. Figure 2 details a phasing plan for the overall subproject.

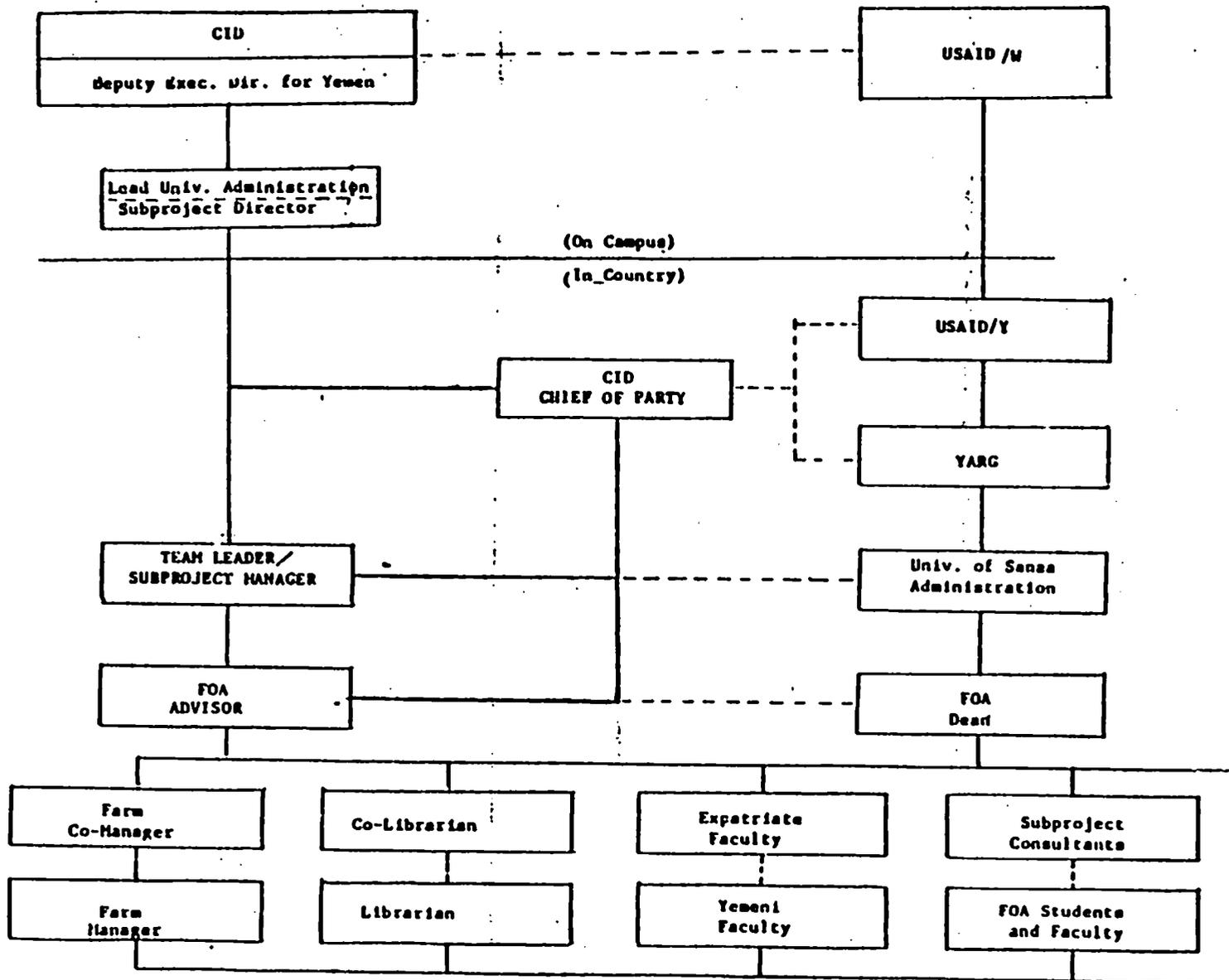
Overall subproject management will lie with the Subproject Director, located on the lead university campus. The Director will have responsibility for overall subproject activities, including such things as managing fiscal and personnel concerns, maintaining proposed implementation schedules and work plans, preparing subproject reports, responding to internal and external evaluations, and providing liaison with the CID Deputy Executive Director for the Yemen ADSP and CID lead university officials. The position ranges from a full-time position during the early years of the project to 0.50 FTE during the final subproject year.

The subproject also calls for full-time on-campus secretarial/accounting support to the Subproject Director (see Table 3).

~~247~~

76

FIGURE 1
 ORGANIZATIONAL CHART FOR FOA SUBPROJECT ADMINISTRATION AND TECHNICAL ASSISTANCE ^{1/}



1/ Solid lines represent administrative and/or operational linkages.

FIGURE 2 (CON'T.)

PROPOSED SCHEDULE OF MILESTONES — FCA SUBPROJECT

ACTIVITY	-	-	-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	95	96	97	98	1999	
Facilities/Commodities																				
Pre-fee (Bldg)		IX	IX	XXI																
A/E Design (Bldg)					XXIXXX	XXX														
Procure Comm					XXX	XXXXXXXX	XXXXXXXX	XXX												
Constr Bldg					X	XXXXXXXX	XXXXXXXX													
Bldg in Use							XXX	XXXXXXXX	XX	XX	XX	XX	XXXXXXXX							
Design Farm		IX																		
Constr Farm				XXXXXXXX	XXXXXXXX	XXX														
Establish Farm						XXX	XXX													
Farm in Use							XXX	XXXXXXXX	XX	XX	XX	XX	XXXXXXXX							
Evaluation																				
Internal						XXX		XXX				XXX								
External							XXX				XXX				XXX					XXX
Curriculum and Teaching																				
Design Curriculum			XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX														
Instruction by FOS					XXX	XXXXXXXX	XX	XX	XX	XX	XXXXXXXX									
Instruction by Expats						XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXX								
Instruction by CORE PTs						XXX	XXXXXXXX	XX	XX	XX	XX	XXXXXXXX								
Instruction by FOA PTs										XXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XXXXXXXX	XX	XX	XX	XX	XXXXXXXX
Operation																				
Students Entering					▼	▼	▼	▼	▼											▼
Students Graduating					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Faculty Services																				

Legend: X = Major Level of Activity x = Minor Level of Activity ▼ = Monitoring

-50-

81 X

TABLE 4

Person-Year Analysis of On-Campus Subproject Management and Support, In-Country Technical Assistance and Participant Training

Category	Subproject Year											Total
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	
I. On-Campus subproject Management and Support												
A. Subproject Director	0.75	1.0	1.0	1.00	1.00	0.75	0.75	0.50	0.50	0.50	0.50	8.25
B. Secretary/Accountant	0.75	1.0	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.75
Subtotal	1.50	2.00	2.00	2.00	2.00	1.75	1.75	1.50	1.50	1.50	1.50	19.00
II. In-Country Subproject Management and Technical Assistance												
A. Team Leader/Proj. Manager	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	11.00
B. Faculty Advisor	-0-	0.50	1.00	1.00	1.00	1.00	0.50	-0-	-0-	-0-	-0-	5.00
C. Farm Co-Manager	1.00	1.00	1.00	1.00	1.00	1.00	0.50	-0-	-0-	-0-	-0-	6.50
D. Co-Librarian	-0-	-0-	-0-	1.00	1.00	-0-	-0-	-0-	-0-	-0-	-0-	2.00
E. Expatriate Faculty	-0-	-0-	2.00	4.00	4.00	3.00	2.00	1.50	0.50	-0-	-0-	17.00
F. Subproject Consultants	0.33	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.13
G. Graduate Student Supervision	0.40	-0-	0.63	0.29	0.58	0.17	0.63	0.29	0.17	0.17	-0-	3.33
H. Project Evaluation	-0-	-0-	-0-	0.48	-0-	-0-	0.48	-0-	-0-	-0-	0.48	1.44
Subtotal	2.73	2.58	5.71	8.85	8.66	6.25	5.19	2.87	1.75	1.25	1.56	47.40
III. Participant Training	7.0	20.00	25.00	28.00	25.50	22.00	16.50	8.50	4.60	1.50	-0-	158.50
TOTAL	11.23	24.58	32.71	38.45	36.16	30.00	23.04	12.87	7.75	4.33	2.58	224.90

51



(2) In-Country Subproject Management. As shown in Figure 1, the in-country management team will consist of the following personnel:

- (a) a Team Leader (TL)/Subproject Manager,
- (b) a FOA Advisor,
- (c) a Farm Co-Manager;
- (d) a Co-Librarian;
- (e) several expatriate faculty hired while Yemeni counterparts complete graduate training programs; and periodic subproject consultants to provide leadership for program modifications, in-service training seminars and workshops, internal and external subproject evaluations, and in-country graduate student supervision.

The TL/Subproject Manager will be responsible for in-country management of the subproject. S/he will maintain in-country subproject fiscal records, handle subproject commodity flow from stateside couriers, and other logistical and management support as deemed appropriate. S/he will work closely with the in-country CID/USAID fiscal and administrative personnel and with FOA fiscal and personnel staff in a counterpart training capacity through the duration of the subproject. The Subproject Manager will be hired immediately upon approval of the subproject.

The FOA Advisor will assume his/her responsibilities midway through the second subproject year as his/her Yemeni counterpart returns to the YAR following a 6-month administrative internship at a U.S. agricultural institution. The FOA Advisor will work closely in a counterpart training mode with the Dean of the FOA to assist in its management and development. The person selected for this position should have had experience as a senior-level administrator for a U.S. agricultural university instructional program. S/he will maintain office hours in the FOA building and generally keep abreast of the daily concerns that will arise as the faculty begins to adjust to its new surroundings and expanding student population. S/he will report directly to the TL/Subproject Manager and in-country Chief of Party (COP) for administrative guidance and logistical support. As indicated in Table 3, this position will be phased out midway through the seventh subproject year.

The subproject calls for a person to serve as co-manager of the FOA instructional farm. This person will be hired immediately to provide in-country leadership for the development and implementation of this important facility. The candidate selection criteria should focus on construction and design capability of farm facilities (buildings, roads, fences, water delivery systems, etc.), knowledge of practical livestock, poultry, and crop production and management, and a practical understanding of how such a facility can enhance and complement a developing instructional program at the baccalaureate level. The instructional farm is described in detail in Annex J. The Farm Co-Manager will work closely with his/her Yemeni counterpart, as indicated in Figure 1, to provide leadership for the daily operations and management of the farm. S/he will seek ways to encourage expatriate and Yemeni faculty to use the farm regularly as an avenue to the hands-on, practical application of appropriate agricultural production technology for the YAR. The Farm Co-Manager will report directly to the in-country Faculty Advisor for administrative leadership. This position will be phased out midway through the seventh subproject year, at which time his/her Yemeni counterpart will assume full management of the instructional farm.

The Co-Librarian will join the in-country subproject staff at the beginning of the fourth subproject year as the faculty building nears completion. This person, trained in library science, will be responsible for assembling and referencing the library resources that will constitute the FOA library. His/her primary goal will be to train a Yemeni counterpart who will have been trained in library science at a U.S. agricultural university. The Co-Librarian will also look to the FOA Adviser for administrative leadership. The position will be a 2-year assignment.

Expatriate faculty will be hired early in the implementation phase of the subproject to teach the courses in the curriculum while Yemeni counterparts complete their graduate programs abroad. Annex E (Table E-2) indicates the areas of specialization where expatriate input is needed. The subproject calls for 17 person-years of expatriate faculty input, beginning midway through the third subproject year and phasing out during year 9. It is likely that third country nationals will be sought in this capacity as they must

be fluent in both Arabic and English. The expatriate faculty will look to the FOA Advisor and FOA Dean for administrative leadership.

Consultants are projected as regular inputs in this subproject. A total of 5.9 person years are budgeted to provide leadership for program modifications, in-service training and workshops (see Annex I for details), subproject evaluations (see Section V.C. for details), and in-country graduate student supervision (see Annex E, Section G). These experts will be selected for specific planned inputs as the project progresses. They will be contracted by the on-campus Subproject Director in direct response to perceived needs in-country.

b. Participant Training: A detailed schedule of participant training is presented in Annex E (Table E-1). This activity, already authorized and initiated under the Core Subproject, has placed three participants in graduate programs at U.S. agricultural universities, with four more in language preparation prior to entrance into graduate programs. The FOA Subproject would eventually train 22 additional participants through the Ph.D. in appropriate disciplines for the FOA. The subproject will also provide post-baccalaureate and/or M.S./M.A. training for one person in library science and another with specialization in ESL/technical agriculture. A total of 173 person years of graduate training is projected through the life of the project, sufficient to allow for adequate faculty given normal retention rates.

Selection of graduate candidates will be jointly administered by the collaborative efforts of officials from the UOS, MAF, USAID, and CID. Every effort will be made to select and encourage women to seek graduate training and eventually become faculty members. The social implications of women as direct beneficiaries of this subproject are described in Section IV.B. and Annex F of this paper. The participant training scheme is also an integral part of an attempt to assure long-standing relationships with U.S. agricultural universities, as spelled out in detail in Section IV.A and Annex E. Coordination of participant selection and placement will be jointly administered by the Subproject Director and the in-country CID Core Training Advisor. The final three participants are scheduled to complete training and join the FOA at the end of the tenth year, as shown in Figure 2, p. 49-50.

c. **Instructional Farm Development:** One of the first activities to be initiated upon the approval of this subproject will be the development of an instructional farm adjacent to the FOA with facilities, buildings, and equipment to offer a wide range of practical learning experiences for FOA students and others that might come to the FOA for short courses, workshops, and in-service training. This projected 22-hectare resource is described in detail in Annex J, and its integration into the curriculum and impact on project beneficiaries is detailed in Annexes E and F.

It is proposed that USAID contribute \$2.99 million to this facility, excluding contingencies and inflation. It is extremely critical that this farm be ready for use as the first class of students enter the FOA in September 1987. Mobilization activities initially approved in the SPID were postponed pending the discussions with the YARG relative to other donor funding of the FOA building. The instructional farm will benefit agricultural development efforts in Yemen through its demonstrations, farmer visits, etc.

d. **Classroom and Laboratory Materials and Equipment:** The subproject proposes that USAID provide limited classroom and laboratory materials and equipment that would complement teaching, research, and extension programs of the FOA. Table 6 in Section IV.D. indicates that approximately \$1.71 million in obligations has been targeted for expendable and non-expendable equipment for the FOA building and instructional farm. These commodities, coupled with the building furnishings and equipment itemized in Annex K and provided by an outside donor, will provide the FOA with the basic items necessary to launch the programs and outreach of the FOA.

e. **Library Reference Material Development:** The subproject calls for the establishment of a separate FOA library to be designed into the proposed faculty building. While USAID will not fund the building and library construction, the subproject recommends that USAID provide approximately \$0.3 million to provide the rudimentary reference materials necessary to initiate a separate lending library for students and faculty of the FOA.

The proposal for a separate FOA library is consistent with the experience of other UOS faculties, and has resulted from the limited facilities of the central university library. It will be designed similar to those on most university campuses in the U.S. Its major clientele will be the students and Faculties of Agriculture, Science, and

Commerce. The students and faculty will use the library for the preparation of research and term papers, extension information, and general classroom/laboratory use. The FOA library will be a teaching/academic research facility containing reference materials, journals, books, and relevant periodicals for students.

The subproject will provide second baccalaureate or M.S. degree training in library science for a Yemeni to eventually be designated as the FOA Librarian. S/he will be assisted in the development of the library by a U.S. librarian counterpart, as indicated earlier in this section.

The SPID discussed the unique role the FOA library will play apart from the Documentation and Learning Resource Center (DLRC) to be funded by USAID for the MAF. While these two units will differ in location, clientele, and purpose, every effort will be made to coordinate the sharing of materials and published information.

7. Conclusion

The SPP team considered similar projects in other developing countries and incorporated the lessons learned into the design of this FOA. U.S. LGUs serve as the predominate model for development of the teaching, research, and extension components of the FOA. The curriculum is based on the studied agricultural needs of the YAR. This led to the design of a highly practical, competency-oriented curriculum. The organizational structure, physical facility, and appropriate linkages are all outgrowths of this basic strategy.

The manpower analysis (Annex H) documents the existing and projected requirement for trained agricultural expertise.

The SPP team believes the proposed subproject is technically sound and appropriate to the needs of the YAR.

B. Social Soundness Analysis

The social soundness issues relevant to the proposed FOA at the UOS are discussed at length in Annex F. Specific considerations are highlighted in the following section. These issues include: the status of agricultural education in the YAR, the purpose of the FOA, the source of students, the beneficiaries of the FOA, education of women in the YAR, the impact of the FOA on women, employment opportunities for FOA graduates, and the institutional linkages of the FOA to Yemeni society.

1. Agricultural Education in the YAR

Agricultural education in the YAR is limited. No agriculture is taught in the primary, preparatory, or secondary schools. However,

students can take a science option in the secondary school system which includes 3 years of training in mathematics, biology, chemistry, physics, mechanics, and statistics. This training provides sufficient academic background for pursuing further education in agricultural subjects. Specialized long-term training in agriculture in the YAR is available through technical agricultural secondary schools. Short-term training programs are offered by various donor projects.

2. FOA Subproject Purpose

The primary purpose of the FOA Subproject is to develop the institutional capacity within the YAR to train Yemeni men and women as agriculturalists at the baccalaureate level. This is to be accomplished through the establishment of a FOA within the UOS.

3. Source of Students

The major source of students for the FOA will be from the secondary schools (science option) (see Annex F). In addition, graduates from the agricultural secondary schools who have demonstrated academic excellence will be potential candidates for admission to the FOA. University administrators estimate that 80 percent of FOA students will come from the secondary schools and 20 percent from the three agricultural schools. Directors of the agricultural and secondary schools concur with these estimates. The current "pool" of prospective students in secondary science options and technical agricultural schools totals 3,494 students. Based on a preference study administered by the SPP Team, it can readily be concluded that enrollment expectations of the FOA can be adequately met by this "pool".

4. Student Educational Preference Study 10/

One important factor in evaluating the likely success of a FOA in the YAR is the interest by secondary students in enrolling in an agricultural curriculum. In order to assess this factor, a questionnaire (Annex F, Figure 4) was designed and administered to students in the scientific stream of the secondary school system, to students in the two agricultural secondary schools and to students in the Veterinary Secondary School (Sanaa). Results of the survey are summarized in Annex F (Table F-4).

Based on the student educational preference study, school visitations, oral interviews, and the assessed potential sources of students, there should be an adequate supply of students available to the FOA. Given the size of the potential student pool, which is expanding rapidly, the enrollment would be met if only 4.8 percent of the pool matriculated with the FOA. In fact, the general consensus of secondary school administrators is that there will be far more students than available training slots in the new FOA. A detailed analysis of the sources of students is in Annex F.

5. Beneficiaries

a. **Primary and Secondary:** The primary beneficiaries of the FOA Subproject are expected to be the agricultural students trained at the B.S. level who enter the private and public sectors directly or who go on for advanced degrees. Salaries, prestige, personal satisfaction, and upward economic mobility are viewed as the principal economic and personal benefits.

The secondary beneficiaries of the FOA Subproject are expected to be the people served by agricultural institutions. The FOA will provide trained Yemeni men and women to fill technical and administrative positions for both public and private institutions, with the greatest intended emphasis upon public institutions. The public institutions include the research and extension components of the MAF, the semi-autonomous regional development authorities, and other public institutions, such as the MOE, which require agricultural graduates to serve their programs. People served by the small but expanding agri-business sector of Yemen, including credit banks, agricultural input supply firms, and agricultural product processing and marketing firms, also will be secondary beneficiaries. The extent to which the public versus private sectors will benefit from the FOA is not known at this time.

b. **Tertiary:** The tertiary beneficiaries of the FOA Subproject are expected to be local villagers through the improved technical training at the agricultural institutes, FOA research studies and developments, the hiring of graduates of such institutions by the NES, and proposed placement at the provincial and local levels. The local extension centers are expected to test, evaluate, and modify for local conditions the research work conducted at the regional experiment stations.

c. **Education of Women in the YAR:** Traditionally, women have not been educated in Yemen. The major constraints to educating females in Yemen have been social attitudes and family obligations that keep girls at home and the pattern of early marriages.

Families objected to educating daughters on moral grounds. Girls were not allowed to study publicly in the presence of boys and male teachers. Furthermore, it was felt that women did not need to be educated because their families or husbands were responsible for taking care of them.

Today, many of these attitudes toward educating females are beginning to change. As more and more women become educated, social barriers will disappear gradually. Progress is being made slowly, and it will continue.

There are men and woman pioneers who have taken the initiative to promote changes. They will be the ones who provide the momentum for continuing change and progress in the educational system in Yemen. Their spirit is strong. Their own words best reflect their commitment towards accomplishing these goals. On educating women, a UOS male faculty member said:

"The best way to protect the (Yemeni) woman is by educating her. She is a person, after all. By educating her, she will be protected from ignorance, disease and poverty, and, in turn, she can protect all of us. . .her family, her husband and the society. She is our sister. . .we are all human."

How fast will this change occur? It will be gradual, but it will happen. A Yemeni extension woman stated firmly:

"Don't limit your thinking (in the development of the FOA) to what is possible today. The situation (in Yemen) will change over time. Every day and every month there are changes. Things are beginning to happen that were impossible before. In 5 years, there will be many more opportunities for men and women than what are available today. We must look to the future with an open mind."

There are Yemeni who are committed to improving their society. It will take a unified effort on their part. They are willing, and they will succeed.

d. The Impact of FOA on Women: The official policy of the YARG encourages women to attend school. Opportunities for educating Yemeni women are increasing slowly. It is important that serious thought be given to encouraging and supporting this trend at all levels of training. This is especially critical since male emigration has placed many women in key production roles. Hence, women must have access to appropriate training in agriculture in order to improve their individual productivity, which, in turn, will contribute to the growth of the Yemeni economy.

It is essential that the FOA encourage women to study the agricultural sciences. They should actively recruit

women making them aware of the opportunities in agriculture. They need to have a support structure once they enroll; the curriculum needs to include courses that will attract women; university research and extension activities must be responsive to the needs of rural women and men throughout Yemen; and job opportunities for B.S. graduates must be assessible to women.

Following are several suggestions for encouraging women to enroll in the FOA. First of all, FOA faculty could visit the secondary girls' schools to meet with the third-year science students to provide them with information and written literature about the faculty. It would be advantageous if this faculty member were a woman. Meeting with the parents also could be arranged.

Housing is another issue that is of particular concern for women. Some women will be able to stay in the women's dorms with family approval. For others, this may be more difficult. Assistance with arranging alternative housing with relatives or families would help to encourage the enrollment of women from more traditional families. As more women enroll and as society begins to accept some of these changes, it will become increasingly easier for other women to enroll. Already, there are approximately 300 UOS women students who are in residency homes under the supervision of a house mother.

Another incentive for women to enroll would be the availability of financial assistance and scholarship support. This is particularly important for families with several children. Usually, the family resources are invested in the education of boys first, then the girls. If alternative assistance was available, it would encourage families to educate the girls also.

Orientation and a support structure for women, once they have enrolled, is extremely important. This can be accomplished through formal orientation sessions and informal group meetings of women students and women faculty members. A woman faculty student advisor could direct and advise women in their scholastic programs, give them moral support, and provide them with a positive role model to observe. It would be impossible for a male faculty member to provide this type of support, since he does not face the same constraints as women.

The existence of women faculty members would help attract women students. Therefore, it is recommended that qualified women be identified in all fields of agriculture.

Based on the established selection process for selecting participant trainees of the future FOA faculty, qualified women and men could be selected for advanced graduate training. A number of eligible women for participant training have come to the attention of the SPP team. (See Footnote 16 for a list of these women. Also see Table E-1, Annex E, for a list of the participant trainee positions. Additional discussion on the selection process is discussed in the text of Annex E.)

The curriculum of the FOA was designed to include courses that will attract women. Based on the assessed interests of women in secondary schools, and the needs of rural women, the recommended curriculum for general agriculture is relevant to both women and men. (see Annex E, Table E-3). Because rural women are engaged in all aspects of agricultural and livestock production, food processing, management of farm and family resources, marketing, family nutrition, and extension, there is no need to have a dual track curriculum.

University curricula, research, and extension activities must be responsive to the needs of rural women and men. In order to accomplish this, it is recommended that women faculty members be represented and/or consulted on the following university advisory boards: The Curricula Review Committee, the Research Advisory Committee, and the Extension Coordinating Committee, (see Annex E for further discussion of these committees).

e. Extending Benefits to Farmers and Farmer Groups: There are several types of media that are being employed for disseminating agricultural information to rural communities: Television, video films, slide shows, printed materials, demonstrations, and group meetings. Such media have proven to be an effective means for communicating information in the YAR. Therefore, what is needed are additional materials and more qualified extension personnel rather than new approaches.

The FOA could provide leadership in producing films and other media that are aimed at the agricultural sector through cooperation of their extension faculty. Men and women students could help in developing such materials through class projects.

Specific attention should be devoted to the preparation of information for rural women by women students. Because of the social constraints that make it difficult for rural men and women to participate together in group meetings,

much of the extension material will need to be prepared with a specific target group in mind.

7. Employment Opportunities for FOA Graduates

In order to attract students to the FOA, there must be employment opportunities for them after they graduate. It is anticipated that there will be many opportunities for FOA graduates to staff the MOE and the MAF in technical, professional, and administrative roles; to staff the on-going donor supported agricultural and rural development projects; to provide personnel for the emerging agri-business sector; to collaborate in the development and staffing of a National Agricultural Extension Service; and to provide technical expertise for numerous LDA and a growing credit bank system. (see Annex G for a comparison of salary levels for various occupations in the YAR, 1983).

All of these jobs would be available to both men and women if they are motivated and interested. Already women are employed in the governmental ministries, private agri-business companies, academic institutions and donor projects. Among the women and men interviewed, there was a general consensus that professional women could work in these jobs without a problem.

8. Institutional Linkages

The FOA as planned will have a significant impact on the social structure of the YAR. Annex E outlines the four major areas in which these linkages will operate. However, particular attention is appropriate to the significance of these linkages to particular components of Yemeni society.

The young people, both men and women, will have an additional opportunity for university level education, hence, employment opportunities. These linkages are outlined in Annex E (Figure E-6). Of particular significance in these linkages are the opportunities for women to access professional careers in both the public and private sectors. Examples include employment as extension personnel, food processing industry employees, managers of agricultural statistical reporting agencies, and writers of technical agricultural literature. Another source of professional employment for women will be within the agricultural education enterprise itself.

Men and women associated with agricultural operations in the rural areas of the YAR will be linked to the FOA as outlined in Annex E (Figure E-4). This diagram highlights the variety of pathways by which knowledge will flow into this particular sector of society. As these people experiment with and adopt more effective agricultural, village sanitation and resource management techniques, the bondages of low income, drudgery labor and poor health will give way to improved lifestyles.

9. Conclusions

The FOA Subproject has been proposed to develop the institutional capacity within the YAR to train Yemeni men and women as agriculturalists at the baccalaureate level.

The SPP team has conducted a detailed evaluation of the agricultural education needs in the YAR, the available institutional capabilities for training in agricultural disciplines, the potential sources of students, the interest of students in enrolling in an agricultural curriculum, the curriculum needs for men and women students and the potential impact of the FOA on secondary and tertiary beneficiaries.

Based on interpretation and analysis of secondary and primary data (see Annex F) the SPP team has established the following:

- a. There is a need for trained agriculturalists in Yemen at the national, provincial and local levels;
- b. Agricultural education in the YAR is limited;
- c. The FOA would provide a needed institutional capacity to train Yemeni men and women as agriculturalists at the baccalaureate level;
- d. There is a sufficient supply of students available to the FOA;
- e. There is more than sufficient interest by students in enrolling in agricultural curriculum;
- f. The proposed curriculum for general agriculture is pertinent to and appropriate for both men and women;
- g. Women students need to be encouraged to join the FOA;
- h. Participant trainees for the FOA faculty need to include both men and women;
- i. FOA research and extension activities must respond to development needs of the rural population; and
- j. Sufficient employment opportunities exist for FOA men and women graduates.

Hence, from a social soundness perspective, the SPP team believes the proposed subproject is sound and appropriate to the needs of the YAR.

C. Economic and Budgetary Analysis

1. Least Cost Analysis

a. Internal Versus External Training: Although this SPP identifies many ways in which anticipated benefits of the proposed SPP will emerge, it is not possible to quantify the private and social costs and benefits to make a determination of economic feasibility. An alternate approach consists of two steps. The first step is to note the primary and most tangible output of the FOA: The training of a target number of B.S. level general agriculturalists by the end of the project life and the capacity to train graduates at a specified rate thereafter. The second step is to analyze the costs of establishing and operating the FOA compared to the costs of achieving this output by training in established institutions. Experience has shown that training that is most similar to that to be offered in the proposed FOA can now be provided in a select number of Arab universities or in the United States. Training in Western European or Eastern Bloc countries is not an admissible alternative. Furthermore, USAID has had prior experience with the two alternatives, leading to adequate information on the annual per student costs.

This comparison, a least cost analysis of the three alternatives (called FOA, Arab, and U.S. for short), was performed. Although the details of the analysis are thoroughly discussed in Annex G, it is important to note some important features of the analysis. First, a total "present value (PV) of costs" taken over a given planning horizon (21 years) was considered as the principle indicator of cost effectiveness. However, there is deemed to be special merit in using indicators which reflect the availability of graduates to offer their services in the YAR after receipt of degree and, in particular, the availability of graduates to serve in the MAF. Hence, two indicators were calculated which show PV costs per graduate retained in the MAF and PV costs per graduate retained in the YAR. Using a base level set of cost figures and other assumptions, the least cost indicators shown in Table 5 were derived.

This base level analysis indicates clearly that training B.S. level graduates in the U.S. is not an economically viable option. Because the comparison of the costs of the FOA and the Arab options reveals a narrower difference in costs, they must be considered more carefully, however. The analysis shows the FOA alternative as clearly having the least cost with respect to costs per graduate

TABLE 5

Present Value Costs per Retained Graduate:
Base Level Run

	Costs (\$)		
	Alternative		
Least Cost Indicator	FOA	Arab	U.S.
1. Total Present Value of Costs	\$ 69,576,000	\$ 64,171,000	\$ 159,967,000
2. Total Present Value of Costs per Graduate Retained in YAR	\$ 35,735	\$ 36,880	\$ 103,472
3. Total Present Value of Costs per Graduate Retained in MAF	\$ 44,657	\$ 55,320	\$ 275,806

26

retained in the MAF. But with respect to cost per graduate retained in the YAR the difference is closer.

A major part of Annex G is devoted to an elaboration of this analysis and the various assumptions. A major concern is whether the Arab university costs critically affect the results of the analysis. A sensitivity analysis conducted on the model with respect to this factor reveals that the FOA would have the least total present value of costs if the Arab cost per student per year was increased to \$8,750. In annex G, other assumptions in the analysis are altered in order to test their effects on the least cost indicators.

The analysis should not be concluded without due consideration of factors that transcend the kind of economic analysis approach used here. Important quality considerations are at issue. A top rate Yemeni faculty is involved in the FOA option, whereas there is believed to be some unevenness in the quality of the Faculties of Agriculture in Egypt, Jordan, and Syria. Furthermore, the way the FOA is envisioned to interface with the agricultural sector of Yemen (as specified in other parts of this SPP) cannot be paralleled in the Arab options even though a cost of FOA faculty services is added to the Arab and U.S. options. Training programs "customized" for Yemen could be established at Arab institutions but only at much higher costs.

b. Other Internal Alternatives: The FOA SPID listed "within the YAR" alternatives to the project design detailed in this SPP. The SPID suggested that four of these alternatives would involve lower costs than the current design. One alternative did not list a specific comparative cost. Two alternatives were listed as more expensive. Two of the suggested lower cost options involve modification/expansion of the ISAI. One significant social cost of this alternative would be subordination of the goals of the agricultural secondary school. As discussed in the SPID, there are significant quality considerations involved with these alternatives, which clearly favor the FOA.

c. Conclusions: The FOA has a significant least cost advantage compared with a U.S. training alternative. It has a clear advantage in one least cost indicator (and a slight advantage in the other) when compared with an Arab training alternative. The least cost advantage apparently experienced by Arab universities in the one other category could be increased when:

(1) Per student per year costs at Arab universities are increased;

(2) Significant quality advantages incorporated into the proposed FOA can be valued;

(3) Intangible, but significant linkages that a FOA will have with the rest of the YAR economy are valued; and

(4) Direct contribution of the FOA to the mission of the MAF is valued.

2. Budgetary Analysis

a. The YARG Development and Recurring Budget: The economy of the YAR is characterized by very significant external components; remittances of 300,000 to 400,000 Yemeni men working abroad, high levels of expenditures on imported commodities, and payments to expatriate professionals working in Yemen which are remitted out of the country. Recent trends in these indicators of the external economy indicate cause for concern. Remittances have stabilized or slightly declined. The once restrained spending on consumer goods has given way to more lavish spending especially for imported goods.

The domestic private economy is relatively undeveloped, and consists of small, uniformly dispersed, regional trading centers. The domestic public sector economy is largely dependent on import duties for revenues. Vigorous expansion of the public sector economy is largely dependent on import duties for revenues. Vigorous expansion of the public sector has been facilitated by external donor-supported projects. The monetary requirements for operating these projects (assumed by the YARG) and for carrying out the normal functions of government threaten to exceed the ability to generate public sector revenues. Further discussion on this issue as well as a prognosis for remedial action is included in Annex G, Economic and Budgetary Analysis.

b. Budgetary Allocations to Higher Education: Annex H contains information pertaining to the financial operations of UOS, the principal institution of higher education in the YAR. Because a detailed financial history of the university was not available, it was only possible to infer a rough estimate of the operating budget of UOS, its past history, and its likely continuity over future periods. The operating budget figure appears reasonable for an institution the size of UOS. The general education budget (stated in real terms) has been increasing at a significant rate.

The YARG investment in general education activities is projected to continue increasing throughout the SFYP. In spite of an awareness of general governmental budgeting constraints, the YARG officials in CPO, MOE, and UOS were emphatic in their opinion that the UOS would continue to receive funding for operations of present and planned facilities.

C. Operating a FOA at the UOS--Recurring Costs: The proposed FOA budget was reviewed with officials of the UOS. In spite of these figures, it was difficult to conclude anything about whether the FOA would constitute an unreasonable burden to the UOS. Conclusion: It is believed that the YARG is committed to fulfilling its objectives in the educational sector. Yet there is uncertainty about the allocation of budgets in the UOS. Strong assurances will have to be provided by officials at the UOS, MOE, CPO, and, perhaps, at the highest levels of the YARG that the proposed FOA will be allocated its recurring costs over the lifetime of the project and beyond.

D. Summary Financial Plan

1. Total Project Costs

Establishing a FOA in Yemen, including facility construction, will cost approximately \$86.7 million. The estimated cost of the proposed USAID subproject is approximately \$29.2 million.

2. USAID Contribution

It is recommended that USAID provide a \$29.2 million grant to finance the design and construction of the FOA instructional farm, technical assistance, participant training, commodity support, and other direct costs. Approximately \$6.1 million (20 percent) of the USAID funds will be for direct purchase of Yemeni Rials to cover specified local cost items.

Included in the \$29.2 million USAID grant is approximately \$2.9 million to fund A/E services to design the FOA and Instructional Farm buildings and supervise construction. The detailed budget and SOW for the A/E services are contained in Table 1a and a prefeasibility study which is in Annex L.

3. YARG Contribution

The YARG contribution will approximate \$31.5 million in Yemeni Rials equivalent for land, salaries, operating costs, etc., but excluding university overhead costs of administration, faculty to teach service courses outside of agriculture, student room and board, etc. (see Annex E for a detailed discussion of the institutional analysis.)

4. Other Donor Contribution

The balance of the funding will be parallel financing in the form of a loan from another donor for construction of the FOA classroom, lab, office, and library facilities. The parallel financing could be as much as \$25.9 million. The YARG is expected to provide funds for any construction not supported by a parallel financing loan.

Tables 6 and 7 summarize the proposed financial plan for the establishment of the FOA. Budget details are provided in Annex I.

5. Physical Contingency and Price Escalation

The local inflation rate has recently dropped from 30 percent to approximately 12 percent and is projected to drop to 10 percent by 1986 (the third project year and second year of inflation). It is estimated that average annual international price increases will be 7.5 percent in 1984 and will drop to 6 percent by 1986 (see State 015268, 1/13/83).

The budget includes a physical contingency of 5 percent for each year of the subproject. An inflation rate of 3 percent (compounded) was used for both the foreign exchange and local currency budgets. On the capital construction elements of this subproject a 10 percent physical contingency and inflation factor was used. Inflation was factored on the physical contingency. Inflation and contingency thus applied total approximately \$19.7 million for inflation and \$2.7 million for contingencies.

E. Institutional Analysis

The reader is referred to Annex E, Section I, for more detailed information concerning the UOS and the FOA.

1. UOS

The UOS was founded in 1970. In the short span of 13 years, seven faculties have evolved. These had 231 faculty members and 6,372 students in the 1982/83 academic year. Many buildings have been constructed on two campuses within the city of Sanaa. This dramatic growth was supported by the YARG and directed by a capable university administration. An administrative structure, similar to that which has been effective in U.S. LGUs, has evolved to that shown in Annex E.

The UOS was initially part of the MOE. Today, however, it is independent of that ministry. It does maintain a vital linkage with the MOE through the Minister of Education chairing the Advisory Council which prescribes policy for the university.

Budget submission of the UOS to the Ministry of Finance and the CPO is independent of submission from other governmental entities.

Table 6

Summary Financial Plan - FOA Components^{1/}

CATEGORY	USAID		YARG (\$ Equivalent)	OTHER DONORS Parallel Financing	ESTIMATED TOTAL
	Dollar	Local Currency			
Land	---	---	12,400	---	12,400
Personnel	4,838	---	7,466	---	12,304
Allowances	1,575	---	---	---	1,575
Travel and Transportation	1,564	351	502	---	2,413
Commodity Support	1,241	228	---	---	1,469
Participant Training	5,760	---	---	---	5,760
Development of Instructional Farm Buildings including Farm Buildings	464	2,167 ^{2/}	---	---	2,631
Facility Construction	---	---	---	18,100	18,100
Other Direct Costs	3,048 ^{3/}	1,655	2,708	---	7,249
SUBTOTAL	18,400	4,556	23,076	18,100	64,222
Contingency at 5% and 10%	486	316	634	1,378	2,714
Inflation, compounded @ 8% and 10%	4,134	1,205	7,972	6,428	19,739
TOTAL (Rounded)	23,110	6,078	31,582	25,906	86,675

1/ Marginal difference due to rounding

2/ Approximately 75 percent is for local construction const

3/ Includes language training (\$0.045 million), A/E design and construction supervision of faculty and instructional farm buildings (2.903 million), and Core Payment (0.1 million).

Table 7

Summary Financial Plan for Faculty of Agriculture Subproject (\$000)^{1/}

CATEGORY	SUBPROJECT YEAR											TOTAL
	1	2	3	4	5	6	7	8	9	10	11	
I. USAID BUDGET												
A. USAID Dollar Budget	1992	2641	2384	2765	2337	1959	1760	1058	745	465	384	18489
1. Contingency, 5%	26	61	62	72	70	53	50	31	24	18	19	486
2. Inflation, 8% (compd.)	-	102	221	391	530	520	617	475	434	386	468	4134
Subtotal	2018	2804	2667	3226	2937	2533	2427	1554	1203	870	871	23110
B. USAID Local Currency Budget	1241	115	338	391	430	286	289	156	127	92	91	4556
1. Contingency, 5% and 10%	109	97	17	20	21	14	14	8	6	5	5	316
2. Inflation, 8% & 10% (compd.)	-	120	60	107	162	141	178	117	113	96	111	1206
Subtotal	1350	1332	415	518	613	441	482	281	247	193	207	6078
TOTAL USAID BUDGET	3378	4136	3082	3743	3551	2975	2908	1835	1450	1062	1078	29188
II. YARG BUDGET	12400	53	671	756	833	1055	1191	1346	1474	1589	1709	23075
A. Contingency, 5%	-	3	34	38	42	53	60	67	74	79	85	534
B. Inflation, 8% (compd.)	-	4	120	206	315	519	734	1009	1317	1667	2080	7972
TOTAL YARG BUDGET	12400	60	824	1000	1190	1627	1984	2422	2854	3336	3875	21582
III. OTHER DONOR FINANCING	-	-	9050	9050	-	-	-	-	-	-	-	18100
A. Contingency, 10%	-	-	689	689	-	-	-	-	-	-	-	1378
B. Inflation, 10% (compd.)	-	-	3214	3214	-	-	-	-	-	-	-	6428
TOTAL OTHER DONOR FINANCING	-	-	12953	12953	-	25906						
GRAND TOTAL	15778	4205	16859	17698	4741	4601	4892	4256	4314	4392	4953	86695

^{1/} Differences due to rounding.

E. 111

The UOS plans to add four faculties: Agriculture, Veterinary Medicine, Pharmacy, and Dentistry. These will require new facilities and will increase administrative and operative costs of the university.

Success of the new faculties depends upon the capability of the FOS which will teach mathematics and basic science courses for their students. The FOS presently teaches, and will continue to teach, courses for students in four faculties: Education, Commerce and Economics, Engineering, and Medicine. The FOS has the administrative capability and professional staff, which can be increased to teach courses for its majors and perform the service teaching role. However, its facilities are limited. To accommodate some increase in enrollment, the facilities now used from 0730 to 1400 hours may be used from 0730 to 1800. Also, some increases can be made in class sizes.

2. Faculty of Agriculture

The FOA, as proposed, is compatible with administration of the UOS. It should benefit from the administrative structure, policy mechanisms, and services which have evolved in the university. Women faculty members and women students should be readily accepted in the FOA. They are in all the other faculties and fill leadership roles in the MAF. Just as the UOS is dependent upon hiring non-Yemeni faculty members, the FOA will utilize some non-Yemeni until Yemeni educated to the Ph.D level replace them. Initially, the FOS will teach the mathematics and the basic science courses for students in the FOA in existing facilities. However, the classrooms and laboratories for these courses must be constructed either in the facilities of the FOA or elsewhere in the UOS.

V. IMPLEMENTATION ARRANGEMENTS

A. Implementation Strategy

1. USAID/Yemen

The USAID/Yemen Agricultural Development Office (ADO) will assume full oversight and monitoring responsibility in consultation with other elements of the Mission. This will include, but not be limited to, technical assistance, approving annual workplans, expediting diplomatic relations with the YARG, approving budgets, and organizing external evaluations. A Project Officer will have ready access to the CID FOA Subproject Director and TL, and will work cooperatively with the USAID/Yemen ADO and CID/Core COP for coordination with other elements of the ADSP.

USAID/Yemen will arrange for other technical inputs from USAID that are required, such as review and periodic monitoring by an USAID/Yemen engineer of the USAID-funded construction elements of the instructional farm.

2. CID

The project was designed and will be implemented by CID as a subproject of the ADSP (279-0052). USAID will sign a subproject contract with CID. OSU has been selected as the lead university and will be responsible for providing the on-campus Subproject Director and meeting all technical aspects of the subproject. All other long-term and short-term staff recruitment shall be through all participating CID universities. OSU will be responsible for subproject administration in close cooperation with the CID Executive Office in Tucson, Arizona, and with the Core Subproject administration.

All of the CID universities have a strong tradition of teaching, research, and extension. There will be a large pool of professionals and technicians from which to draw expert technical assistance. The project does not require any full-time individuals with highly unusual, rare skills; staffing, therefore, is not expected to be a problem. OSU will assign a Subproject Director on the OSU campus who will coordinate all technical and administrative backstopping through the CID network. An Acting Subproject Director has already been designated. Additionally, the CID Deputy Executive Director for Yemen will work collaboratively with the Subproject Director to insure full and appropriate backstopping of the FOA Subproject.

The proposed FOA Subproject will be implemented as an activity under the ADSP. A contract amendment will be negotiated between USAID and CID to provide technical assistance, commodity procurement, participant training, funds with which to develop the Instructional Farm, and overall subproject administration and campus backstopping. USAID will negotiate a contract to provide A/E design and construction supervision services for the FOA and Instructional Farm. CID will work closely with selected A/E firm(s) in an advisory role as design specifications for

buildings are developed. Finally, the YARG will negotiate an agreement with another donor to provide the financial resources with which to construct the FOA building.

CID will enter into a subcontract(s) with a local contractor for construction of the instructional farm. In order to facilitate the work under the subcontract(s), facilitate UOS participation, and provide some legal protection to CID (operating in a country with relatively limited legal protection for outsiders in any disputes that may arise), the UOS will be signatory to the subcontract. Selection of the subcontractor will be in collaboration with the USAID/Yemen.

CID expects the Mission to arrange periodic oversight and monitoring by an USAID engineer to assist in insuring that USAID procedures and quality standards are met.

The relationship of the various entities involved with the construction of the principal buildings deserves some elaboration. The UOS is presumed to be the owner of all structures and should be represented in the construction and outfitting process by a duly authorized construction manager. It is in the interest of the YAR, AID/W, USAID/Y, CID and the parallel donor, that steps be taken to secure the services of a highly qualified A/E construction supervisory firm with extensive international construction services. This firm should have a demonstrated capability to supervise construction by foreign-owned firms and should have the ability to backstop its field personnel from its own staff. It would be in the interest of all parties that the A/E construction supervisory firm be selected on a competitive bidding process according to Federal Procurement Regulations after a list of pre-qualified firms is determined by AID/W. This process may take time, but experience in the YAR and elsewhere in the Near East and in Europe has shown that AID-supported projects have been constructed with fewer cost overruns and fewer delays when an experienced A/E construction supervisory firm is involved.

After the final preparation of FOA building plans (coordinating with UOS; USAID/Y, CID), the A/E firm will solicit bids from prequalified construction firms. Since several foreign-owned firms have extensive projects in the YAR, it is likely that a foreign contractor will be selected. Once a contractor is selected, the YAR or UOS will issue construction documents. The relationship between the owner (UOS), the A/E firm, and the contract will be governed by rules pertaining to international construction activities. When construction on the FOA building commences, the A/E firm approves progress on regularly-scheduled basis and submits approved claims to the UOS. After additional approval(s), claims for payment would be submitted to the parallel donor.

B. Implementation Schedule

A detailed implementation schedule is presented in Annex M. The initial work plan and scopes of work for the initial subproject personnel are presented in Annex O.

~~2~~

105

C. Subproject Evaluation

Since the primary purpose within the management control of the subproject is to support the establishment of a FOA within the UOS, the initial emphasis in evaluation will be given to assessing accomplishment at the purpose level. As the subproject nears completion, and at an appropriate interval after it has been terminated, the emphasis in evaluation will focus on the extent to which the subproject has achieved goals and subgoals (See Logframe, Annex B).

Another important feature in this evaluation plan will be the close involvement of the MAF, MOE, and UOS officials to familiarize them with the concept and usefulness of self-evaluation and to prepare them to use evaluation strategies at key decision points as FOA programs expand in the future.

1. Baseline Data Development

In order to realize evaluation objectives, it is essential as a first undertaking to develop a body of baseline data on the present situation with regard to the agricultural sector efficiency. For the purpose of developing baseline information, it is proposed that the MAF, MOE, and UOS appoint an Evaluation Study Committee composed of the following:

- Dean, FOA, UOS
- Director, Technical Office, UOS Administration
- General Co-Manager, CID ADSP, MAF
- Director of Agricultural Education, MOE
- In-Country FOA TL/Subproject Manager, CID
- Faculty Advisor, CID

This committee will be charged with assembling and/or monitoring a comprehensive set of baseline data on the current situation (as of the end of FY 1984/85) relative to the following items and any other matters the committee deems relevant to a complete picture of manpower training and the impact of the development of the FOA at the UOS:

- a. Participant training -- recruitment, English language training, enrollment, retention, placement data.
- b. Facilities construction and equipment procurement data, schedule, progress.
- c. FOA data on secondary student interest, recruitment, matriculation, retention, graduation, and placement.
- d. Evidence of developing linkages between the FOA and agencies or entities in the public and private agricultural sector, such as:

- (1) consulting time
- (2) workshops offered
- (3) service on committees
- (4) other

e. Manpower assessment data in the public and private agricultural sector of the YAR, i.e., number of jobs, entry training requirements, etc.

f. Socio-economic data of the rural agricultural sector including, but not limited to, the following:

- (1) number of individual farmers
- (2) average size of individual farm unit
- (3) average net farm income
- (4) measures of unit productivity
- (5) utilization of capital inputs to increase productivity
- (6) on-farm consumption of production
- (7) purchase of consumer durables
- (8) agricultural produce sales
- (9) some measurement of health status, i.e., births, deaths, medical data.

The committee, with the assistance and participation of a short term consultant from the subproject, will prepare a report summarizing this baseline data by the end of the initial subproject year. This report will provide part of the information needed for subproject evaluation.

The report will also assess the need for further data and information collection in succeeding years.

2. Monitoring and Evaluation Plan

A monitoring and reporting plan is concerned with the manageable interests of the subproject (inputs and outputs). Monitoring entails watching and influencing key activities and accomplishments while reporting implies not only the narrative of who, what, where, and when but also why things happened the way they did. A key element of monitoring and reporting is, however, the limiting of effort to only generating information which is necessary for decision-making, accountability, and motivations. The proposed monitoring and reporting plan for the FOA is designed, moreover, to contribute to success in carrying out the periodic subproject evaluations as described below. The monitoring tasks can be viewed in two ways. First, an overview of the monitoring tasks is included in Figure 2 on page 44 and 45. The timing of the monitoring is shown by the inverted triangles. Second, the monitoring and reporting tasks are delineated more fully in Table 8. Note that in this list some events only occur once (episodic) and some occur on a regular periodic basis. The monitoring and reporting plan is provisional at this stage. It is essential that project management give serious considera-

Table 8
Monitoring and Reporting Plan (Provisional)

Item or Milestone	Episodic (E) Periodic (P)	Timing	Indicator	Target	Data Source	Report: Recipient
Conditions precedent are met	E	Before subproject agreement signed	Progress of YARG in meeting conditions	All conditions met	YARG records; signed agreements	CID; YARG; USAID/Y
A/E contract approved	E	After PROAG	bids	low bid from qualified A/E	Bids from A/E firms	CID, YARG
A/E design work	P	Semi-annual	review of A/E design	conforms with pre-feasibility design;	A/E reports	CID, YARG, AID/W
Building contractor selected	E	End of year 1	bids	low bid from qualified contractor	Itemized bid	CID, YARG, USAID/Y
Instructional farm contractor selected	E	Beginning of year 1	bids	low bid from qualified contractor	Itemized bid	CID, YARG, USAID/Y
Contractor progress checked (building)	P	Semi-annual	Comparison of planned to actual activities	All planned activities met on time	Contractor records, billings, visual inspections	Contractor CID, YARG
Contractor progress checked (farm)	P	Semi-annual	Comparison of planned to actual activities	All planned activities met on time	Contractor records, billings, visual inspections	Contractor CID, YARG
U.S. administrative personnel identified	E	3 months prior to PROAG	Commitments to accept positions	Quality personnel	Correspondence between CID/CORE and individuals	CID, YARG
U.S. administrative personnel in place	E	ASAP after PROAG	TDY by designates before PROAG (CID/CORE) Final acceptance	Permanent duty station ASAP after PROAG	Correspondence; Contracts	CID, Individuals
Performance, U.S. administrators	P	Annual	Administrative and technical capability maintained	Timely provision of leadership and collaboration with YARG, USAID/Y	CID/OSU records	CID, YARG
Yemeni FOA Dean, Farm Co-Manager Internship	E	Year 1	Selected for Internship Matched with U.S. Inst.	Competence in Internship	UOS Records Host Institution	CID, USAID
Yemeni Leadership (Dean, ass'ts.)	P	Annual beg. yr 2	Estab & Maintain Working relationship w/ FOA Advisor, Team Leader UOS Admin., Other Fac.	Timely opening of FOA; admittance of students, staff dev, etc. Good rapport with U.S. staff	YARG records Evaluations	CID, UOS, USAID
Participant Training selection, performance	P	Annual	Lang. scores, acceptances, progress, elapsed time	Highly qualified candidates	Application, refs, univ. records	CID, USAID, UOS
Yemeni technical staff performance	P	Annual beg. yr 2	Working effectively w/ U.S. counterparts	Instructional farm, lib. achieving goals	YARG records Evaluations	CID, UOS, USAID
Commodities procured	E,P	Annual yr 2 - 5	Building outfitting, equipment selected, etc.	effective selection and utilization of equip.	Project records	CID, UOS
Expatriot Instructors selected	E	Year 3	Language and specialty field	Arabic-speaking; crop production	Applications, references	CID, UOS, USAID
Admissions process	E,P	annual	Admissions criteria	Excellent, motivated	Applic/Ref	UOS
FOS Teaching	P	semi-annual	proficiency, spec. needs	Meets FOA requirements	Admin rating	CID, UOS
Yemeni FOA Teaching	P	semi-annual	proficiency, spec. needs	Meets FOA requirements	Admin ratings	CID, UOS

tion to implementing such a plan in preparation for the series of evaluations as described below.

3. Subproject Evaluation Plan

Given the extended life of the subproject (11 years), USAID/Y recommends that the subproject be subjected to a series of internal and external evaluations to more clearly assess its progress and to insure that its design remains relevant to the needs of the YAR. Table 9 summarizes significant subproject milestones at which it is appropriate to conduct internal and external assessments of subproject progress. At each interval, the key questions to be asked have been identified as well as the basic decision that will be made as a result of the evaluation team conclusions. A more detailed plan for each internal and external evaluation is presented in Table 10. In each case, the purpose(s) and key questions is/are defined and the key indicators and assumptions are itemized with the data needed to arrive at recommendations.

The timing and number of internal and external subprojects evaluations has been delinked from the overall ADSP program and depends on the internal dynamics of the subproject itself.

A key focus of the initial internal evaluation will be to teach subproject personnel the evaluation process. To accomplish this, it is proposed that an external consultant be provided to provide leadership training in strategies for effective self-evaluation. Costs for this TDY consultant are included in the budget estimates, Annex I. It is critical that subproject personnel and their counterparts use the evaluation mechanism to provide effective subproject management.

The final external evaluation is projected for an interval of time about five years beyond the EOPS. Achievement of subproject goal and subgoal will be a slow, gradual process. The establishment and operation of linkages necessary to impact the socio-economic status of rural life will take time. It would not be appropriate to assess accomplishment at this level at any earlier time. The costs of this final evaluation are not included in Annex I.

4. Responsibilities for Evaluation Implementation

The internal evaluations will be in-house evaluations conducted jointly by USAID/Y, CID, and the YARG. The report of these evaluations will follow the Project Evaluation Summary (PES) format to be prepared and submitted to AID/W and CID/Tucson for review and comment.

The responsibility for each external evaluation, i.e., selecting the team, final review, and acceptance of the report and submission to USAID/W, will rest with USAID/Y. It is expected that USAID/Y will do this in collaboration with CID, the MAF, and the UOS.

TABLE 9

Significant Subproject Milestones, Subproject Year, Evaluation Type,¹
Key Questions To Be Asked, and Basic Decisions To Be Made During and Beyond the FMA Subproject

Significant Subproject Milestone	Subproject Year	Evaluation Type	Key Question(s) To Be Asked	Basic Decision(s) To Be Made
1. Subproject personnel in place and subproject underway.		Internal	1. Is there a monitoring scheme in place? 2. Are subproject personnel capable of self-evaluation?	1. Continue the subproject as is. 2. Continue, but modify or change.
2. Facilities construction completed	4	External	1. Is the FMA ready to implement the baccalaureate program?	1. Continue the subproject as is. 2. Continue, but modify or change. 3. Cancel the subproject.
3. Initial participants complete graduate training.	5	Internal	1. Are the participants appropriately trained?	1. Continue the subproject as is. 2. Continue, but modify or change. 3. Cancel the subproject.
4. First students complete baccalaureate program	7	External	1. How has the FMA performed in preparing graduates?	1. Continue the subproject as is. 2. Continue, but modify or change. 3. Cancel the subproject.
5. Additional students complete baccalaureate program.	8	Internal ¹	1. How has the FMA performed in preparing graduates?	1. Continue the subproject as is. 2. Continue, but modify or change. 3. Cancel the subproject.
6. EOPS for FMA achieved.	11	External	1. Was the subproject purpose achieved?	1. Terminate as scheduled. 2. Extend the subproject. 3. Cancel the subproject.
7. FMA assuming anticipated role in agricultural sector.	16-18 ²	External	1. Was the subproject goal/subgoal achieved?	1. Recommend model as mode for implementation elsewhere. 2. Do not recommend replication elsewhere.

¹This internal evaluation is optional, and will be carried out only if the answer to the "Key Question" of the external evaluation in subproject Year 7 is such that the FMA has performed poorly in preparing graduates for jobs in the public and private agricultural sector.

²The FMA subproject is designed for termination at the completion of 11 years. The proposed external evaluation should occur 5-7 years after the subproject has been completed.

-78

11D

TABLE 10

Overview of Faculty of Agriculture Subproject Evaluation Process
Including Purpose, Proposed Key Questions to be Answered, Key Indicators and Assumptions,
and Data Needed for each Internal and External Evaluation

Evaluation	Evaluation Purpose	Key Questions to be Answered	Key Indicators and Assumptions	Data Needed
First Internal (Year 3)	<ol style="list-style-type: none"> 1. Assess efficiency/ effectiveness of subproject personnel to manage and monitor subproject progress. 2. Begin to develop in the YAR (MAF, MOZ, UUS) for evaluating subproject progress. 	<ol style="list-style-type: none"> 1. Did each item planned actually happen? 2. If not, why not? 3. What was the relationship between the various subproject levels? 4. Were the activities and resources suitable and sufficient for producing the outputs? 5. What was the rough cost/ effectiveness at each level? 6. Were there any unanticipated secondary benefits or costs related to the subproject? 	<p><u>Indicators:</u></p> <ol style="list-style-type: none"> 1. Faculty building and instructional farm construction progress. 2. Number and quality of graduate participants in training at U.S. agricultural institutions. 3. Relationship with subproject personnel and other YARG, CID and USAID/Y personnel. <p><u>Assumptions:</u></p> <ol style="list-style-type: none"> 1. Adequate funding for construction is available by 6/1/85. 2. Adequate utilities (water, power, sewer) available to support operation of facilities, including instructional farm. 3. Quality participants are available for training and will meet English requirements. 	<ol style="list-style-type: none"> 1. Construction and equipment procurement data, schedule progress. 2. Participant training records, progress. 3. Interview data from YARG, USAID/Y, CID personnel.
First External (Year 4)	<ol style="list-style-type: none"> 1. Assess the readiness of the FOA to implement the baccalaureate program. 	(Same as above)	<p><u>Indicators:</u></p> <ol style="list-style-type: none"> 1. Faculty building and instructional farm construction progress. 2. Availability of equipment, resources, supplies, and services. 3. Preparation of FOA and staff. 4. Preparation of curriculum and individual course syllabi. <p><u>Assumptions:</u></p> <ol style="list-style-type: none"> 1. Construction can be completed within four years of subproject initiation. 2. Equipment and teaching resource vendors can supply subproject needs in a timely manner. 3. U.S. agricultural institutions can prepare Yemeni participants to teach relevant courses in agriculture at the baccalaureate level. 	<ol style="list-style-type: none"> 1. Construction and equipment procurement data, schedule progress. 2. Inventory lists. 3. Interview data from FOA and support staff. 4. Course syllabi, schedules.

TABLE 10 (Continued)

Evaluation	Evaluation Purpose	Key Questions to be Answered	Key Indicators and Assumptions	Data Needed
Second Internal 1. (Year 5)	Assess the appropriateness of participants' preparation to embark on FFA mission.	(Same as for first internal evaluation, above)	<p><u>Indicators:</u></p> <ol style="list-style-type: none"> 1. Degree of satisfaction/dissatisfaction of graduate participants. 2. Graduate dissertation topics and applicability to the YAR. 3. Participant recruitment, enrollment, retention, and placement data. 4. Student assessment of relevancy of coursework and FFA performance. <p><u>Assumptions:</u></p> <ol style="list-style-type: none"> 1. U.S. Agricultural institutions can prepare Yemeni participants to teach relevant courses in agriculture at the baccalaureate level. 2. U.S. Agricultural institutions will establish policies enabling participants to do graduate research in the YAR, if possible. 	<ol style="list-style-type: none"> 1. Interview data from participants, students. 2. Dissertation titles, expert assessment of applicability to the YAR. 3. Participant data.
Second External 1. (Year 7)	Assess the quality of the FFA in preparing graduates for careers in the public and private agricultural sector.	(Same as for the first internal evaluation, above)	<p><u>Indicators:</u></p> <ol style="list-style-type: none"> 1. Degree of satisfaction/dissatisfaction of employer/graduate relative to job performance. 2. Student recruitment, enrollment, retention, placement data. <p><u>Assumptions:</u></p> <ol style="list-style-type: none"> 1. Quality secondary students are available. 2. Career and job opportunities exist in the public and private agricultural sector. 	<ol style="list-style-type: none"> 1. Interview data from employers/graduates. 2. Recruitment, enrollment, retention, placement data.
Third Internal 1. (Optional) (Year 8)	Repeat of above, based on unfavorable conclusions of second external evaluation, to determine if recommended changes are beginning to reverse degree of dissatisfaction.	(Same as for the first internal evaluation, above)	(Same as above)	(Same as above)

117

TABLE 10 (Continued)

Evaluation	Evaluation Purpose	Key Questions to be Answered	Key Indicators and Assumptions	Data Needed
Third External 1. (Year 11)	Assessment of achievement of subproject purpose.	(Same as for the first internal evaluation, above)	<p><u>Indicators:</u></p> <ol style="list-style-type: none"> 1. An operational, indigenous FOA within the UOS engaged in teaching, research, and assisting the MAF with extension. 2. Student enrollment and graduate projections in line with targeted levels. 3. Graduates assuming responsible positions in the public and private agricultural sector. 4. Ongoing collaboration between the FOA and the MAF, MOE, and private producers in research, extension, curriculum development, and in-service training. 5. A productive and on-going relationship between FOA and U.S. Agricultural colleges and universities. 6. An operational instructional farm integrated into the curriculum of the FOA, providing students opportunities for relevant, practical experiences. <p><u>Assumptions:</u></p> <ol style="list-style-type: none"> 1. UOS policies will continue to support FOA development. 2. UOS is able to assume total recurring costs of FOA. 	<ol style="list-style-type: none"> 1. FOA personnel data and subproject records. 2. FOA data on student recruitment, admissions, retention, graduation, and placement. 3. Surveys of graduates. 4. Collaboration records and data. 5. Records on formal and informal contacts with U.S. agricultural colleges and universities. 6. Subproject evaluation reports of instructional farm utility.
Fourth External 1. (Year 16-18)	Assessment of achievement of subproject goal/subgoal.	(Same as for the first internal evaluation, above)	<p><u>Indicators:</u></p> <ol style="list-style-type: none"> 1. Increased agricultural production. 2. Improved agricultural trade balance. 3. Increased farm income. 4. Increase in trained agriculturalists. <p><u>Assumptions:</u></p> <ol style="list-style-type: none"> 1. Agriculture will remain an important economic activity in rural YAR. 2. Incentives to attract Yemeni graduates to employment in agricultural sector persists. 3. Demand will continue for agricultural students. 	<ol style="list-style-type: none"> 1. YARC agricultural sector statistics. 2. Socio-economic analysis of rural agricultural sector. 3. MOE, MAF, UOS, FOA records. 4. Previous subproject evaluation reports.

82

X
113

In selecting evaluation team members, it is critical that a special effort be given to placing a quality team in the field following a meaningful orientation in terms of the team's scope of work.

D. Subcontracting Plan

The prime contractor, CID, will submit a subcontracting plan for the FOA Subproject which will become part of the contract with Oregon State University in Corvallis, Oregon.

The lead institution, Oregon State University, is an Equal Opportunity Employer, and will follow established guidelines in hiring employees both from within and outside of the university system. In addition, the university will submit a subcontracting plan for the procurement of vehicles, household furniture, equipment, materials, supplies, nursery stock, plant materials, language training, participant training, and other items utilized and/or purchased by and for the subproject, which will include maximum participation of small and minority businesses.

The AID/W will contract with an engineering firm to provide the Architect and Engineering Studies required to initiate the construction of the FOA and Instructional Farm buildings and to supervise the construction activities. Preliminary studies were completed by an 8a minority firm during project design. The Mission will encourage small and minority businesses to participate by submission of bids for consideration by AID and the YARG.

Finally, the Mission will periodically contract with a consulting firm to perform external evaluations of the FOA subproject. Bids from small and minority businesses will be solicited for the evaluations.

FOOTNOTES

- 1/ Draft, SFYP, Chapter 3, p. 27, YARG, March 1982.
- 2/ IBRD, Yemen Arab Republic Agricultural Sector Analysis, Nov. 1981; see also IBRD, "Manpower Development in the YAR," March 1981, p. 84.
- 3/ USAID Agricultural Sector Assessment, 1982.
- 4/ Ibid.
- 5/ Ibid.
- 6/ Ibid.
- 7/ Ibid.
- 8/ Ibid.
- 9/ Ibid.
- 10/ In order to determine potential interest levels in the FOA, questionnaires were administered to science students in secondary schools in Hodeidah, Taiz, and Sanaa. Second and third level students enrolled in the science option were polled. The following schools were included in this survey.

Hodeidah

1. Omar Ibn Abn Al-Aziz Secondary School (boys):
 - a. Third level: Natural History Class.
 - b. Second level: English Class.
2. Bilquis Secondary/Preparatory School (girls):
 - a. Third level: Law Class.
 - b. Second level: Math Class.

Taiz

1. Farouk Secondary School (boys):
 - a. Third level: Chemistry Class.
 - b. Second level: Math Class.
2. Bilquis Secondary/Preparatory School (girls):
 - a. Third level: English Class.
 - b. Second level: English Class.

[Handwritten mark]

115

Sanaa

1. Gamal Abdul Nassar Secondary School (boys):
 - a. Third level: Physics.
 - b. Second level: Math.
2. Arwa Secondary School (girls)
 - a. Third level: Physics
 - b. Second level: English

In addition, students in the Surdud Secondary Agriculture School, the Ibb Secondary Agricultural Institute, and the Bir El-Guhourm Veterinary Secondary School (Sanaa) were polled to determine the interest level in the FOA.