PD-ABD-070 12990

END OF PROJECT REPORT

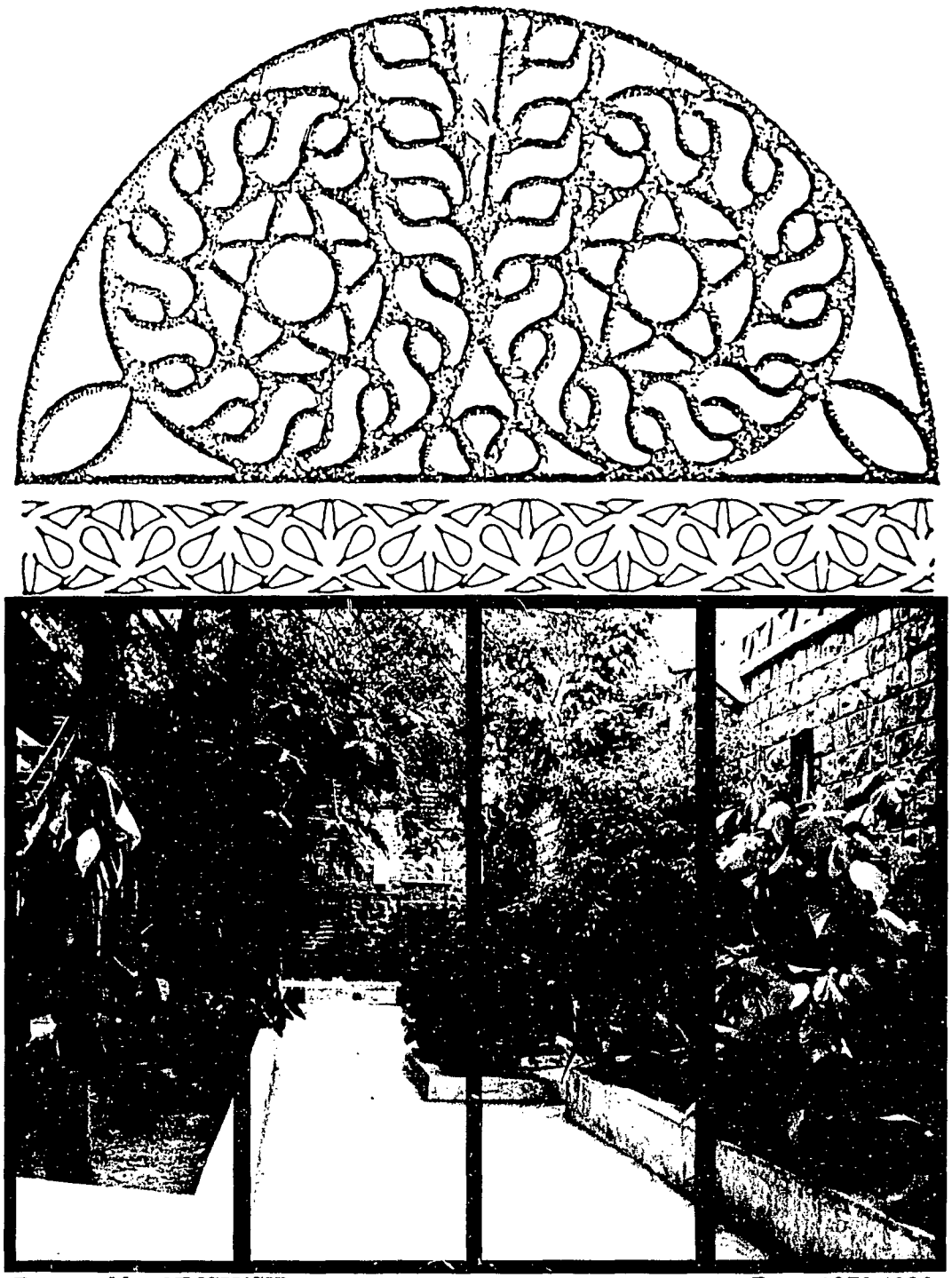
for

THE AGRICULTURAL EDUCATION DEVELOPMENT PROJECT

under the auspice of

The Agricultural Development Support Program

Republic of Yemen



Prepared by: NMSU/CID

Date: 1979-1990

Consortium for International Development
New Mexico State University
Contract No. AID/NE-C-1698
Project Number 279-0052

TABLE OF CONTENTS

		Page
A.	Executive Summary	1
B.	Background	7
C.	Rationale for the ISAI/AED Subproject	10
D.	The ISAI/AED Project	11
	1. Initial Activities & Agreements	
	2. Purpose and Objectives	
	3. Shift in Institutional Emphasis	
E.	Implementation Strategy and Accomplishments	17
	1. Manpower Development	
	2. Curriculum Development	
	3. Textbooks and Instructional Material - List	
	4. School Farm Development	
	5. Outreach Program	
	6. School Administration and Operation	
	7. Agricultural Education System Development	
F.	Conclusions	32
G.	Recommendations	33
H.	Appendices (Inputs)	38
	1.0 Training Summary	
	2.0 Instructional Materials	
	3.0 Facility Improvement and Procurement Summary	
	4.0 Outreach Training Programs	
	5.0 School Enrollment Summary	
	6.0 Technical Assistance Summary	
	7.0 Financial and Inventory Summary	
	8.0 List of Acronyms	

CENTER FOR INTERNATIONAL PROGRAMS
IBB Secondary Agricultural Institute/Yemen Project
Box 3567/Las Cruces, New Mexico 88003-3567
Telephone: (505) 646-4448 or 646-4449
TWX 910-983-0549

ACKNOWLEDGEMENT

New Mexico State University would like to take this opportunity to acknowledge the dedicated efforts of key personnel assigned to the project.

The Ministry of Education was instrumental in providing the efforts necessary to successfully establish a National Agricultural Educations System. Dr. Abdoraboh A. Gradah, Deputy Minister of Education and Dr. Mohamed Al-Harazi, Director of Agricultural Education provided invaluable services and support of the project in accomplishing its goals and objectives.

We wish to acknowledge the support and contributions made by the Yemeni School Directors and staff, the local support staff and the Expatriate and American CID/NMSU team.

In addition, appreciation is expressed to USAID/Yemen who provided the funding for this contract, particularly the Agricultural Development Office who provided the technical and administrative support for the project, specifically, Pat Peterson, Tracy Atwood, Ray Rentfro, and John Swanson.

Acknowledgement is expressed to the CID Executive Office and collaborative CID universities for their guidance and support.

A. EXECUTIVE SUMMARY

Background

One of the major constraints to Yemen's long-run development and social and economic growth has been the lack of trained manpower to support the modernization process. This constraint, evident in all sectors of the economy, has been particularly crucial in the agricultural sector.

Therefore, improving agricultural education at all levels was considered critical to the long run development needs and welfare of the country, with priority being given to addressing the need for training at the baccalaureate and secondary levels.

In the mid-seventies the World Bank entered into a contract with the Republic of Yemen government to construct the first secondary school level agricultural institute in Yemen, presently known as the Ibb Secondary Agricultural Institute (ISAI). Through this contract, the World Bank agreed to construct dormitories, staff housing, classrooms, cafeteria, farm buildings and any other buildings or facilities needed for the operation of the Institute. In addition, the World Bank agreed to provide equipment for the school laboratories, farm equipment and tools for the school farm.

In late 1978, the USAID/Y selected the Consortium for International Development (CID) as the Prime Contractor for the Agricultural Development Support Program (ADSP). Subsequently, New Mexico State University (NMSU) was designated by CID as the lead university for the ISAI project.

Purpose

The initial purpose of the ISAI Subproject was to develop an Agricultural Secondary Institute at Ibb which would prepare mid-level technicians who could be employed as Agriculture Extension workers, Agricultural teachers or as technicians in either the public or private Agricultural sector. Thus, the initial institutional development focus of the CID team was on a single educational institution at Ibb. In 1985, however, the institutional focus changed when the project was revised and the name changed to the Agricultural Education Development (AED) Project. The purpose of the revised subproject was "to improve the efficiency of the Secondary Agricultural Education System of the Ministry of Education (MOE) to supply Yemeni, agricultural sector, including both the Ministry of Agriculture and Fisheries (MAF) and the private sector, with qualified manpower". With the change in the project purpose came an accompanying change in the institutional focus of the project. That is, the initial purpose focused on a single institution (ISAI) while the purpose of the revised project focused on an entire Agricultural Education System comprised of three schools and the Directorate of Agricultural Education in the MOE.

Implementation Strategy and Accomplishments

The overall Implementation Strategy for accomplishing the project objectives had two major emphases: Long-Term and Immediate or Short-Term.

The Long-Term Strategy mainly included the identification of prospective Yemeni Teacher and Administrators who could replace the NMSU American and Third Country Professionals prior to the end of the project. Since Agricultural

Education at the Secondary and University levels did not exist prior to the initiation of the ISAI Project, there were no Yemeni who were academically prepared to assume the Technical Teachers and Administrative Roles in this Institute. Thus, the major emphases of the Long-Term Strategy was to provide adequate professional preparation for those Yemeni identified to replace the NMSU Team members as Teachers and Administrators in the ISAI.

The Short-Term Strategy was to take the necessary steps to develop the Educational Programs and Administrative Operations of the ISAI. This included the development of a relevant curriculum, including practicums and a community outreach program, preparation of textbooks and instructional materials, development of an operational school farm and development of policies and procedure for the overall operation of the Institute.

Following is a brief description of the major accomplishments of this project.

1. Eleven Yemeni received their M.S. degrees in the U.S. and eighteen have completed or will complete their M.S. in Egypt. In addition, one Yemeni will be completing her Ph.D. in the U.S.
2. Fifteen ISAI graduates completed their B.S. degrees in Egypt.
3. A competency-based curriculum for the three schools was developed, approved, tested and revised.
4. A program for providing students with practical "hands on" experience was developed and implemented.
5. Eleven textbooks were prepared and used in the school.

6. One hundred and sixty-two Instructional units were prepared, reproduced and distributed for use in the schools.
7. A school farm at each school was developed, equipped and made operational.
8. An outreach program was developed and implemented.
9. Administration of the agricultural education system and individual schools was improved; emphasis was placed on student recruitment, budget preparing, and financial resource allocation, school farm management and operation and establishing adequate administrative policies and procedures for each school.

Conclusion

In general, the objectives and/or outputs of initial ISAI Subproject have been successfully achieved. The means by which these objectives were obtained, however, were different in some instances than had been initially planned. For instance, the initial plan was that all prospective Yemeni teachers receive one year of English Language Training and then receive their M.S. Degree in the U.S.A. However, all trainees took more than one year of English Language Training and only 11 of the 28 received their M.S. in the U.S.A. Although in some instances the means of reaching the project's objectives were different than initially planned, it appears that the objective of the AED Project have been successfully accomplished particularly in relationship to the three SAI's. The three schools have a full complement of trained staff, are implementing a Competency Base Curriculum, have sufficient instructional

materials and references for each agricultural subject area in the curriculum and have the minimum facilities needed for the implementation of the institute educational program activities.

One area within the systems however which could use additional assistance is the Directorate of Agricultural Education. Assistance for this office is critical for it is the hub of the entire system. Although considerable progress was made in the planning and development of the major functions and responsibilities of this office, not enough time was allow to effective deal with this project component.

Generally, an institutional development project must be programmed for 10-15 years if a sustainable institution is to remain after the conclusion of the project. Since project activities relating to the entire system began during the last three years of this project, there was not adequate time to put in place all dimensions of the system nor is there any assurance that those parts of the system which were developed will be sustained.

Recommendation

The ISAI/AED Subproject has made a major contribution to the Development of an Agricultural Education system for the Republic of Yemen. However, there are some parts of the system which were not included in the AED Project and some components of the AED project which need further assistance if they are to be sustained.

Therefore, it is recommended that donors who are seeking opportunities to support the growth and development of a comprehensive agricultural education system in Yemen provide funding for one or more of the following program areas:

1. Provide support for the inclusion of an Agricultural Education Teacher Training Program in the Faculty of Agriculture in University of Sana'a. This program can be developed and implemented with a limited amount of support because it can be built upon the courses which are currently being taught and developed in the College of Agriculture.
2. Provide support for the planning of a Post-secondary Agriculture School System and the developing of the first school within this system. Based on the experience gained in the ISAI/AED Subproject, it is recommended that a study be conducted to determine the overall post-secondary education needs in the Agriculture Sector for the next 20 years. Based on this information a tentative plan should be made regarding the system which would need to be developed to serve the projected needs. Subsequently the first school within the system could be built and its educational program could be developed and implemented. Other parts of the system could be put in place over time as the need arises.
3. Provide support for the continual development and improvement of the existing secondary agricultural school system with particular emphasis on the Directorate for Agricultural Education Office. It is recommended

that the current system be improved and more fully institutionalized before any expansion takes place. Limited support over the next 4-5 years could make a sufficient difference as to whether the program developed and implemented under AED will be sustainable over time. Since the major functions of the National Office are critical to the successful operation of the entire system, it is recommended that particular attention be given to these activities.

B. BACKGROUND

The Republic of Yemen, also known as Yemen, is the most fertile part of the Arabian Peninsula. The country is comprised of three major ecologic zones, two of which are significant with respect to agricultural production. The Tihama, a hot, humid, narrow plain along the Red Sea Coast, is a semidesert area with considerable potential for production of tropical crops under irrigated conditions. The highlands, consisting mostly of mountains, upland plateaus, and eroded wadis, is more temperate. A third area, the eastern desert, adjoins the Empty Quarter of the Arabian Desert and is suitable only for extensive grazing by nomadic flocks of sheep and goats. Without major investments in irrigation works to utilize rainfall from the Highlands, it is of little significance for sedentary agriculture.

In the Tihama, annual rainfall varies from 100 to 300mm. The Northern Highlands area receives an average of 200mm rainfall annually near the Saudi Arabian border, but this increases to over 1200mm in the Southern Highlands.

Agriculture in the ROY relies primarily on dryland farming, where rainfall and runoff are carefully managed to produce a single crop annually. Only about 15 percent of the cropland is irrigated, mostly through groundwater pumping, spring flows, and diversion of spate flows from the major wadis which drain the Highlands region.

Of Yemen's eight million people, approximately 80 percent live in the Highlands, congregated mostly in small mountain villages scattered throughout the interstices of the central massif. Most are engaged directly in agriculture on small, fragmented farms.

Historically, dryland grains have been the major staple crop of North Yemen, with fruit, vegetables and legumes as supplements. Coffee, which was once a major crop, was first introduced in the 16th century, but production has declined dramatically during this century. There is some cotton production near the foothills of the Tihama. Livestock has always been linked to crop production in the ROY, providing both food and power to a self-contained system that offers little more than subsistence. Qat, a woody plant whose leaves have a mild narcotic effect when chewed, is grown widely and marketed as a cash crop; its widespread use is a growing social problem.

A new era in Republic of Yemen's political and social development began in 1962. Revolution, Civil War, and establishment of the ROY/YAR were major steps toward modern nationhood. The Civil War, accompanied by several years of drought, caused agricultural production in Yemen to decline significantly during the

decade after 1962. At the same time, temporary out-migration of much of the male labor force to work in the oil fields of Saudi Arabia and other countries on the Peninsula led to a de-emphasis on traditional agriculture. Sector output fell to a little more than half of historical production levels. Nevertheless, rural income increased during this period as migrant remittance flows from workers outside the ROY/YAR exceeded losses in agricultural production.

Beginning in 1972, the economy underwent a dramatic transformation. The increased flow of remittances and resultant monetarization accelerated the shift from a subsistence to a market economy. Out-migration of much of the male work force changed agriculture from a labor surplus sector to a labor deficit sector, and productivity and output has declined. Agriculture remains the largest sector, but sector growth continues to lag behind the rest of the economy. Declining agricultural production and lack of exportable commodities during this decade has led to significant increases in the annual import bill. Increased purchasing power generated by remittances has encouraged the demand for imports, with the result that the foreign exchange deficit is a problem of major proportions.

In spite of low productivity and lagging growth, the agricultural sector still remains the largest and leading sector of the ROY's economy. Soil fertility and climatic factors are favorable. The socio-politico-economic milieu is conducive to sector growth and the national leadership is concerned and responsive to agricultural development needs.

Because of its recent emergence as a modern nation, Yemen currently has not developed the strong institutions needed for a modern agricultural sector. The Yemen economy is characterized by a climate conducive to private sector development. This must be regarded as a positive factor. Nonetheless, those functions which require government interaction with the private sector are not yet well developed. The educational system is a prime example. It is in these areas that international donor assistance was perceived to be most effective.

Development of Yemen's agricultural potential depends on three basic considerations: (a) effective leadership and sector planning to ensure the continuation of a favorable politico-economic environment to provide resources and efficient allocation of those resources to activities supportive of agricultural development; (b) access to scientific knowledge and technical information appropriate to the Yemen agricultural context; and (c) availability of suitably trained manpower and proper utilization of human resources to address real development problems.

This subproject focused on consideration (c) above -- the recruitment and training of technically trained agriculturalists, who will ultimately contribute to Yemen's long-term agricultural sector growth and development.

C. RATIONALE FOR THE ISAI/AED SUBPROJECT

One of the major constraints to Yemen's long-run development and social and economic growth has been the lack of trained manpower to support the

modernization process. This constraint, evident in all sectors of the economy, has been particularly crucial in the agricultural sector.

The 1982 Agricultural Sector Assessment (ASA) concluded that the top priority for U.S. development assistance should be in the area of agricultural education and training. It was noted that:

> "The major impediment to successfully carrying out development activities is the lack of an effectively-functioning staff or work force in the public and private sector."

Adequate agricultural education and knowledge of scientific agricultural is lacking at all levels in Yemen. Thus, basic to future improvement in Yemen agricultural is the critical need for additional indigenous technical, professional, and management personnel. Agricultural extension capacity is grossly inadequate as is the technical capability of the government to plan and implement programs to improve crop and livestock production. The capacity of Yemeni scientists to conduct meaningful research likewise is almost totally lacking. Similarly, the private sector lacks sufficient trained manpower to provide effective agribusiness services and to establish the basis for agricultural production on a widespread commercial basis.

Therefore, improving agricultural education at all levels was considered critical to the long run development needs and welfare of the country, with priority being given to addressing the need for training at the baccalaureate and secondary levels.

D. THE ISAI/AED SUBPROJECT

1. Initial Activities and Agreements

In the mid-seventies the World Bank entered into a contract with the Yemen government to construct the first secondary level agricultural training institute in Yemen, presently known as the Ibb Secondary Agricultural Institute (ISAI). Through this contract, the World Bank agreed to construct dormitories, staff housing, classrooms, cafeteria, farm buildings and any other buildings or facilities needed for the operation of the Institute. In addition, the World Bank (WB) agreed to provide equipment for the school laboratories, farm equipment, and tools for the school farm.

Initially, the Food and Agricultural Organization (FAO) of the United Nations (UN) agreed to provide financial and technical assistance support for the Development and Implementation of the educational program at ISAI. However, FAO was unable to fulfill this commitment and the United State Agency for International Development (USAID) agreed to accept this responsibility.

In late 1978, the USAID/Y selected the Consortium for International Development (CID) as the Prime Contractor for the Agricultural Development Support Program (ADSP). This was an experimental effort that the entire USAID sponsored Agricultural Program was to be implemented by a single contractor.

In early Spring 1979, a CID Team lead by Dr. Upchurch from the University of Arizona (lead university for ADSP) arrived in Yemen to design the ADSP program and prepare project papers for the initial subprojects to be conducted under the auspice of this program.

During the early state of their visit, the Design Team was informed that an Agricultural Education Subproject would be a part of the Agricultural Development

Support Program. However, since neither CID nor the University of Arizona, its lead university, were aware of this situation, no provision were made to include an Agricultural Education Specialist on the initial Design Team. Thus CID/Tucson was notified and New Mexico State University was ultimately identified as the lead university for the ISAI Subproject.

The CID/NMSU Project Director arrived in Yemen in early July 1979, to participate in the preparation of the ISAI Subproject Paper with MOE and AID officials and one consultant employed by AID. During this visit several decisions were made by AID and MOE Officials in consultation with the CID/NMSU representative which affected the Design and Implementation of the ISAI Subproject. First - It was decided that the School Director would be a Yemeni not an American. Second - It was decided that Expatriate Agricultural Experts from the Middle East would serve as Technical Teachers at ISAI since there were no Yemeni teachers qualified to fill these positions. An additional requirement was that teachers should have an M.S. degree from the United State in the disciplines or subject areas they were to teach at the ISAI. Third - Yemeni with B.S. degrees interested in becoming Agricultural Teachers at ISAI would be sent to the U .S. for an M.S. degree. Prior to beginning their academic programs in the U.S., they would study English language and serve as counterpart to the CID Expatriate Staff to gain firsthand knowledge and insight of the overall goals and operations of the ISAI. Fourth - The school farm was perceived as an educational tool and not a production unit. The farm was to provide "hands-on" practical experience for students and others in the community involved in

the Institute's outreach program. Fifth - The Institute was a Training Center as well as a Secondary Agricultural School. Thus, it had the responsibility of providing educational and training opportunities for the people in the community as well as the student attending class on a daily basis. Sixth - The ISAI and not the MOE was the principle Institution the project was attempting to develop. Seventh - A small piece of the school's land would be set aside for the Expatriate Staff housing compound. It was determined that this was the most cost effective manner in which to provide housing for Expatriate Staff. Also, the close proximity of the compound to the school would facilitate Expatriate Staff involvement in the overall program and activities of the Institute. Eighth - While the first funding time frame was five years, it was recognized by all parties that it would take 10-15 years to adequately develop the Institution to the point where it could sustain itself.

2. ISAI Purpose and Objective

The major purpose of the ISAI Subproject was to prepare mid-level Agricultural Technicians for employment as Agricultural Extension Workers, Agricultural Teachers or Agricultural Technicians for the Ministry of Agriculture and Fisheries (MAF), Ministry of Education (MOE) and Agricultural Technicians for Agricultural Business and Industry. The specific objectives of this project were:

a. Train Yemeni Staff for the Technical Teaching and Administrative positions at ISAI.

b. Develop a relevant Technical Curriculum which include adequate practicums.

c. Prepare instructional materials, student handouts and visual aids for each technical subject matter area in the curriculum.

d. Assist in the development and implementation a community outreach program.

e. Assist in the development and establishment of appropriate policies and procedure for the administration and operation of the Institute.

f. Assist in the improvement of school facilities.

g. Assist in the development and operation of the school farm.

h. Assist in the recruitment of students for the ISAI.

3. Shift in Institutional Emphasis

As previously stated, the initial purpose of the ISAI Subproject was to develop an Agricultural Secondary Institute at Ibb which would prepare mid-level technicians who could be employed as Agriculture Extension workers, Agricultural teachers or as technicians in either the public or private Agricultural sector. Thus, the initial institutional development focus of the CID team was on a single educational institution at Ibb. In 1985, the institutional focus changed when the project was revised and the name changed to the Agricultural Education Development (AED) Project. The purpose of the revised subproject was "to improve the efficiency of the Secondary Agricultural Education System of the MOE to supply Yemeni, agricultural sector, including both the MAF and the private sector, with qualified manpower".

With the change in the project purpose came an accompanying change in the institutional focus of the project. That is, the initial purpose focused on a single

institution (ISAI) whereas the purpose of the revised project centered on an entire Agricultural Education System currently comprised of three schools and the Directorate of Agricultural Education in the MOE.

The change in purpose also resulted in a sufficient change in strategy and program focus since the funding level remained the same although the scope of the project sufficiently increased. Some of the sufficient changes which occurred when the project was revised were as follows:

a. Long Term academic training could not be provided for the staff of Surdud and Sana'a Institutes to the extent provided for ISAI in the initial project. Since more teachers were initially trained than were needed at ISAI, the additional teachers were encourage to accept positions at Surdud and the Sana'a institutes.

b. Short Term in-service training was provided for teachers at all three institutes.

c. The majority of in-service training was provided in country. This allowed more teachers to attend at less cost.

d. The Competency Based Curriculum developed at ISAI was introduced and accepted at Surdud and Sana'a schools. The livestock school at Sana'a is using the general agriculture Competency-Based Curriculum developed at ISAI as one of two options being offered to its students.

e. Financial support for the procurement of farm and instructional equipment was provided equally to each of the institutes. Since no

additional funds were provided this resulted in a reduction of the funding being provided for the ISAI for this activity.

f. Financial support for the daily operation of the educational program was provided equally to each of the institutes.

g. Additional technical assistance and financial support has been provided for the National Agricultural Education Office in the Ministry of Education.

Needless to say, the shift in program and financial support was well received by some while causing some dissatisfaction for others. However, it did cause the Ibb school administration and staff to adjust to a lower level of support than received previously and thereby served as a good transition to the time when the project is completed and all support will be terminated. Conversely, the support provided for the other institutions within the system was positively received and well utilized. Although more limited in scope and time than the support received by ISAI, it will greatly assist the system to sustain itself upon the conclusion of this project.

E. IMPLEMENTATION STRATEGY AND ACCOMPLISHMENTS

The overall Implementation Strategy for accomplishing the project objectives had two major emphasis: Long-Term and Immediate or Short-Term.

The Long-Term Strategy mainly included the identification of prospective Yemeni Teachers and Administrators who could replace the CID American and Third Country Staff prior to the end of the project. Since Agricultural Education at the Secondary School and University levels did not exist prior to the initiation of the ISAI

Project, there were no Yemeni who were academically prepared to assume the Technical Teachers and Administrative Roles in this Institute. Thus, the major emphases of the Long-Term Strategy was to provide adequate professional preparation for those Yemeni identified to replace the CID Team members as Teachers and Administrators in the ISAI.

The Short-Term Strategy was to take the necessary steps to develop the Educational Programs and Administrative Operations of the ISAI. This included the development of a relevant curriculum, including practicums and a community outreach program, preparation of textbooks and instructional materials, development of an operational school farm and development of policies and procedure for the overall operation of the Institute.

Following is a brief discussion of the strategy used for each of the major project components:

1. Manpower Development (Training)

a. Academic Training Program

The initial strategy was to identify and place in English Language Training ten prospective Yemeni Teachers per year for the first three years of the project. If all candidates would have successfully passed their TOEFL examination a total of 30 Yemeni Trainees would have been sent to the United States for training during the second, third and fourth year of the project. It was also decided that the trainees would be sent for M.S. degrees because it was less expensive and less time consuming than training for B.S. degrees. Trainees for the Farm Management

positions were the exception. These trainees were sent for B.S. degrees rather than M.S. degree training. Once potential trainees were identified, they were assigned as counterparts to the Expatriate Team in the area of specialization which they would teach upon the completion of their M.S. degrees. Concurrently, the Yemeni Counterparts were enrolled in English Language Training at the ISAI. Thus the Yemeni Trainees worked with their CID Counterparts in the morning and attended English Language Classes in the afternoon. It was assumed the trainees could acquire an adequate TOEFL in one year while at the same time gaining knowledge and insight regarding goals and operation of the ISAI and the specific duties and responsibilities they would have as teachers at ISAI upon the completion of their M.S. degrees.

Unfortunately, some of the assumptions upon which this strategy was developed were incorrect. One, there was some difficulty in identifying enough qualified trainees on a timely basis. Two, in general, Yemeni Trainees had difficulty learning English in the time allowed for this activity. Some never acquired English language efficiency levels to pass the TOEFL examination. The first group of trainees had not reached an adequate TOEFL score after two years of English Language Training. Because further delays would have had serious negative impact on the success of this project, AID, MOE and CID officials agreed to send the first group to NMSU for an additional semester of English Language Training before initiating their academic training programs. This strategy proved to be the most cost effective and successful option.

A different decision was made for the second and third groups of trainees by USAID/Y. USAID/Y mandated that only those individuals who obtained a 500 TOEFL score prior to their departure from Yemen would be sent to the U.S. for M.S. Degree training. Those not obtaining a 500 TOEFL score would be sent to Egypt for their M.S. program. As a result, eleven Yemeni received their M.S. in the U.S. and eighteen have completed or will complete their M.S. in Egypt. In addition, one Yemeni will be completing his Ph.D in the U.S.A. (See Appendix 1.1)

The top five seniors from the first three graduating class were sent to Egypt for a B.S. degree. This was to serve as a motivation for Ibb students to acquire good grades while at the same time provide additional trained manpower for the Agricultural Sector in Yemen.

At the end of the Project the employment status of these trainees were (See Appendix 1.2):

1. Twenty-five had teaching positions in one of the three SAI's.
2. One was in the U.S.A. obtaining a Ph.D degree. This individual will assume a faculty position in the Faculty of Agriculture upon the completion of his Ph.D (AED Sponsored).
3. Five were working in the Dictorate of Agricultural Education.
4. Four were working in the Ministry of Agriculture.
5. Two were completing their Ph.D's in the U.S.A (Core Sponsored).
6. Eleven were completing their M.S. Degrees in Egypt.

7. One was involved in other activities (FOA).

b. Nonacademic Training

A continuous nonacademic training program was provided for the teaching staff and administrators of the three SAI's. In addition, the Dictorate for Agricultural Education received training during the project. This training occurred both in the United States and in Yemen. More than 30 different training activities were conducted for over 90 U.S. participants. More detailed information regarding this subject is contained in Appendix 1.3.

2. Development of a Relevant Curriculum

Since the curriculum provides guidance for development of the entire educational offering of the Institute, it was by necessity a high priority activity. Following is the chronology of events which lead to the development of the existing ISAI Technical Curriculum that has been adopted by the Surdud and Livestock Agricultural Schools:

a. During the first academic year (1979-80) the expatriate Staff provided instruction based on a curriculum guide prepared by the Director of Agricultural Education (Dr. Mohamed Al-Harazi) and an UNESCO Advisor (Mr. Saeed Bisha).

b. During the Summer of 1980, a six-week Curriculum Development Workshop was conducted at NMSU by the CID/NMSU Project Director and Campus Coordinator for the ISAI Project. The participants at this workshop were the CID team members plus the Director of

Agricultural Education, MOE, YARG and the ISAI School Director. As a result of this workshop, a complete Technical Curriculum was prepared and used to guide the instructional program for the ISAI.

c. Similar workshops were conducted the following three summers which resulted in several curricula modifications and revisions based on experience gained regarding the Agricultural, Economic and Social conditions in Yemen. The process of Yemenization of the curriculum provided increased relevance to the overall instructional program.

d. In 1984, it was decided that the Competency Based Curriculum could better prepare ISAI student for future employment opportunities in Yemen. Thus a consultant was acquired to assist the CID team and their Yemeni counterparts in the development of a Competency Based Curriculum for ISAI. The consultant interviewed graduates of ISAI who were employed in a variety of agricultural businesses and industries to determine how well the existing curriculum served their employment needs. Their employers as well as other potential employers were interviewed to determine the types of tasks employees are expected to perform and the knowledge, skills and attitudes employers believe their employees should possess. Based on the information acquire from these interviews plus the consultant knowledge of agricultural occupations, a set of competencies were developed for each technical discipline taught at the ISAI. This set of competencies was reviewed by and discussed

with the CID team members and their Yemeni counterparts. Based on these discussion a revised list of competencies was prepared and a comprehensive competency-based curriculum proposed.

e. Two additional curriculum workshops have been held to critique the original Competency Based Curriculum and to suggest a possible revision. This revised curriculum has been officially approved by the MOE and is being used in the secondary agricultural institutes at Ibb, Surdud, and Sana'a.

During the Life of the Project, considerable effort has been made to provide students with practical "hands on" experience both initially and later in the Competency Based Curriculum. Specific experience which have been incorporated into the curriculum and the daily instructional program are:

- A given number of class hours set aside for "practical" or hands on experience on the school farm, in the greenhouse or in the farm shop.
- Students completing their first year are involved in 6 weeks of practical training during the Summer on the ISAI school farm or one of the other secondary agricultural institutes.
- Students completing two years at ISAI are involved in a summer intern program in selected agricultural industries and/or business. Both students and employers have responded very positively to this activity. In many cases, the employers have expressed their intention to employ these students immediately after their graduation.

-- Third year student at ISAI have been involved in a supervised work experience program on the ISAI school farm.

Although the majority of these activities were new to both the Yemeni students and teachers, both have actively participated in and supported these activities.

3. Textbook and Instructional Material Development

The initial Project Paper did not mention the development of textbooks but rather included the development of instructional material and audio visual aids as an output of this project. However, once the first curriculum was developed both the CID staff and their Yemeni counterparts recognized the need for indigenous textbooks which were based on the Yemen reality. Thus, it was decided that to the extent possible, the CID team would prepare textbooks for the disciplines they were teaching at ISAI. These were seen as resource documents rather than textbooks for their students. Ultimately 17 books were prepared for use in the three Secondary Agricultural Institutes. Appendix 2.1 provides the specific subject matters covered by each of these books. After the Competency Based Curriculum was developed, a decision was made that instructional units rather than complete textbooks would serve as a better resource for the teachers and students in the three Secondary Agricultural Institutes. It was easier to update and make changes in instructional units than in textbooks. It also required less experience to prepare and reproduce these units. Thus 162 instructional units were prepared, edited, reproduced and

distributed during the last three years of the project. Appendix 2.2 includes a list of the instructional areas for which units were developed.

4. Development of a School Farm

The major function of a farm in an educational institution should be to provide educational opportunities for the full time student and those in the community involved in the school's outreach program. This is a difficult principle to follow when the operational budget is inadequate and maximum production is needed to cover part of the operational costs. When the ISAI program began the school farm consisted of a limited set of buildings and land which had not been cultivated for 800 years. During the life of the project, an attempt has been made to develop a school farm which would provide the maximum educational experience for students while at the same time providing some revenue for the school. There were questions raised during the first few years of the project as to whether the school farm contained sufficient land to provide adequate experience for its students. Additional land was acquired in 1987; thus, this is no longer an issue.

Although initial project support was provided only for the ISAI, during the last three to four years of the project limited support was provided for the improvement of the farm and instructional programs at the Surdud and Livestock Schools. As a result, the three schools have a functioning school farm as an integral part of their overall instructional program. The farms concentrate their operations in four major areas: crop production, animal production, farm mechanics, and physical plant management.

Students demonstration plots and supervised work experience have been an integral part of the school farm plan and operations. These activities have been and continue to be popular with instructors and students. Through these activities and good farm planning, crop and livestock production levels have increased and become more efficient.

Several facility improvements were made throughout the life of the project to enhance the overall operation and efficiency of the school farms. A list of these improvements are included in Appendix 3.1. In addition, $1,687,577 of equipment (e.g., tractors, plows, small equipment, etc.) and school supplies (projectors, printing press, etc.) were provided through the project for three schools' instructional programs and school farms. For further details see Appendix 3.2.

5. Outreach Program

One of the major purposes of the project was to prepare mid-level technicians to work in Agricultural Extension and related areas, every effort was made to provide a "hands on" experience for students and prepare them for their future employment opportunities. One of these experiences was the involvement of students in the planning and implementation of a variety of outreach activities, which also provided a service for various individuals, groups and agencies in the community and served to obtain good will and recognition for the school's programs and activities.

The outreach program of the Secondary Agricultural Institute can be classified into three types of activities:

a. Training Programs for Development Project Staff - The schools have taken a lead role in their communities in conducting training programs for staff working in development projects in their respective regions. Examples of training activities which have been provided are:

1. A training program for seventeen project and institute administrators regarding the effect management and administration of development projects and institutes. This was a joint effort with Yemen Public Administrators Institute and UNESCO.
2. A beekeeping short course for Ministry of Agricultural staff.
3. A poultry workshop for Yemeni staff employed in the CID/PETS project.
4. A food technology short course provided during the summer for first year Extension Home Economists employed by SURDP.

During the life of the project more than 50 training activities were provided through the outreach program. See Appendix 4.1 for additional information.

b. Demonstration and Field Day - Several field days and demonstrations in which farmers, local Extension staff, Agricultural workers, and other interested parties in the community participated were conducted on an annual basis during the last four to five years of the project. These activities included a wide variety of management and production practices for the important crops and livestock of the

community. They provided both an excellent learning experience for the students as well as a public service for those working in the agricultural sector of the community.

c. Visiting and Consulting with Development Project Staff - NMSU and CID staff were actively involved in providing advise and technical assistance to staff in the various other development projects in their school community. Through this interaction, arrangements were made to use the other development projects as training sites for the SAI's students. This resulted in a mutually beneficial relationship.

In general, the outreach program has served as an excellent mechanism for providing students with "hands on experience" while at the same time it provided a service for the community and goodwill for the school. Hopefully the program will continue after the completion of this project.

6. School Administration

Since the Secondary Agricultural Institute has been administered by Yemeni Directors and have been perceived primarily with the responsibility of the MOE, the CID team has not been extensively involved in many of the administrative functions of the three institutes. This situation was reinforced by the initial design of the ISAI Project where no budgetary support was included for the administration and operation of the Ibb Secondary Agricultural Institute. This decision, however, was modified for the last five years of the project, where limited financial support was provided for school farm and institutional programs at ISAI and later the other two SAI's.

Given this situation, following is a brief description of the contributions the AED Project made to four administrative areas:

1. Student Recruitment - Although CID provided assistance throughout the project in this area the major contribution was made during the fourth and fifth year of the project when an NMSU consultant prepared a promotional film which described the agricultural sector in Yemen and the employment opportunities for graduates of ISAI. The film was shown on National TV as well as several schools in rural communities. Since the enrollment increased substantially during the last three years of the project, no additional assistance was necessary in this area. For student enrollment information see Appendix 5.1.

2. Management of School Farms - The AED Project provided a Farm Management Specialist from the third to the tenth year of the project. This Specialist assisted in all aspects of farm management and facility maintenance by working with and through Yemeni counterparts to train Yemeni mechanics and maintenance staff. In addition the Specialist developed an overall farm plan which included cropping, livestock system, improved production practices and the integration of the farm operations in the school's instructional program. Specific accomplishments achieved in this area have already been stated in section E-4 of this document.

3. Development of Administrative Policies and Procedures - During the early stage of the project, a Policies and Procedures document for the ISAI was

developed by the UNESCO Consultant and later modified by the Dictorate of Agricultural Education staff. The CID team was asked to review and provide feedback on this document. Subsequently, changes in the Administrative and Operational Policies and Procedures of the three institutes have mainly been the responsibility of the three school directors in consultation with key individuals in the MOE.

4. Budget Preparation and Financing Resources Allocation - This administrative function has mainly been the responsibility of the school's directors and the financial and administrative staff in the MOE. The AED Project did, however, negotiate the used of the limited funds being provided through their project for the schools operations.

In conclusion, CID through the ISAI/AED Project made significant but limited contributions to the administrations functions of the three schools during the life of the project. The major contributions of this project were in the programmatic and operational activities of these schools, such as curriculum development, instructional material development, the implementation of an outreach program, staff development, facility improvement and maintenance, and overall instructional program development and implementation. Since these contributions were discussed previously in this document, no additional comments will be made at this point.

7. Agricultural Educational System Development

As indicated previously, the initial institutional focus of this project was the Ibb Secondary Agricultural Institute. However, in 1985 the focus changed from a

single institution to an Agricultural Education System which comprised three Secondary Agricultural Institutes and the Directorate of Agricultural Education in the MOE. Although this change was initiated in 1985, it did not become fully operational until the CID Team Leader was relocated from Ibb to Sana'a in May 1987, and thus, was able to work with the Dictorate of Agricultural Education and his staff on a daily basis. Although only less than two and a half years remained in the project, considerable results were achieved during this period of time. The major actions taken to enhance the entire agricultural system were:

a. It was decided that all three schools would adopt the competency based approach to curriculum development. Thus, the technical and administrative staff participated in a two-week workshop where they developed a competency-based curriculum for their respective schools.

b. Subsequently, the technical and administrative staff of the three schools participated in two workshops where they developed instructional units which could be used as resource units in their respective schools and subject matter areas. As stated earlier, this resulted in the development of 162 instructional units.

c. Financial support from the AED Project previously given only to the ISAI was equally distributed to all three schools. Each school director was requested to submit a financial plan and budget when requesting these funds. This resulted in a series of in-service sessions regarding the preparation of

financial plans and budgets which was transferable to the process of preparing an annual budget for each of these schools.

d. A printing press was purchased through the project and a Yemeni was trained to operate and provide basic maintenance of the machine. This will enhance the MOE ability to print and distribute instructional material needed by the teachers in the three schools.

F. CONCLUSIONS

In general, the objectives and/or outputs of initial ISAI Subproject have been successfully achieved. The means by which these objectives were obtained, however, were different in some instances than had been initially planned. For instance, the initial plan was that all prospective Yemeni teachers receive one year of English Language Training and then receive their M.S. Degree in the U.S.A. However, all trainees took more than one year of English Language Training and only 11 of the 28 received their M.S. in the U.S.A.

Generally when the means of reaching the project's objectives was different from initially planned it was due to an inaccurate assumption made during the planning of the project. Given the fact that neither CID/NMSU nor AID had any experience in planning an Agricultural Education Project in YAR, it seems logical that a few erroneous assumption would have been made during the planning stage of the project. What was important was that CID/NMSU, AID and MOE were more flexible during implementation stages of this project and made the appropriate adjustments when it became obvious that the initial assumptions were not valid. It

appears that the objectives of the revised AED Project have also been successfully accomplished, particularly in relationship to the three SAI's. The three schools have a full complement of trained staff, are implementing a Competency Based Curriculum, have sufficient instructional materials and references for each agricultural subject area in the curriculum and have the minimum facilities needed for the implementation of the institute educational program activities.

One area within the systems, however, which could use additional assistance is the Directorate of Agricultural Education. Assistance for this office is critical for it is the hub of the entire system. Although considerable progress was made in the planning and development of the major functions and responsibilities of this office, not enough time was allowed to effectively deal with this project component.

Generally, an institutional development project must be programmed for 10-15 years if a sustainable institution is to remain after the conclusion of the project. Since project activities relating to the entire system began during the last three years of this project, there was not adequate time to put in place all dimensions of the system. There is also no assurance that those parts of the system which were developed will be sustained.

G. RECOMMENDATIONS

The ISAI/AED Subproject has made a major contribution to the development of an Agricultural Education system for the Yemen Arab Republic. However, there are some parts of the system which were not included in the AED Project and some components of the AED Project which need further assistance if they are to be

sustained. A comprehensive agricultural education system should include three major components:

1. A Secondary School System which is comprised of a given number of secondary agricultural institutes and a national office which provides the following services for the system:
   - Assist in curriculum preparation, revision and update.
   - Provide leadership in program, faculty and student evaluation.
   - Provide supervision for school administration and staff.
   - Facilitate teaching material acquisition and/or preparation.
   - Provide technical and professional in-service training.
   - Assist in preparing material for and in planning and implementing student practicals, student projects and work experience.
   - Keep appropriate data based and distribute relevant information such as student admission information, student placement/employment opportunities, etc. to key administrators and staff.
   - Provide administrative services in the areas of personnel, operational budget, facilities and equipment, etc.
2. A Post Secondary System comprised of one or more schools which provide specialized training in a variety of Agricultural disciplines depending on the current and foreseeable needs of the Agriculture

Sector Labor Market. These schools could at least initially be administered through the same National Office which administers the Secondary School Program.

3. An Institution (usually a University or College) which provides pre-service and in-service training for future and existing secondary and post-secondary agriculture teachers.

Thus, it is recommended that donors who are seeking opportunities to support the growth and development of a comprehensive agricultural education system in Yemen provide funding for one or more of the following program areas:

1. Provide support for the inclusion of an Agricultural Education Teacher Training Program in the Faculty of Agriculture in University of Sana'a. This program can be developed and implemented with a limited amount of support because it can be built upon the courses which are currently being taught and developed in the Colleges of Agriculture and Education. An agricultural education curriculum for the preparation of Secondary and Post-secondary school teachers could use courses currently being taught in the Faculty of Agriculture for the technical portion of the curriculum and course being taught in the College of Education for the general education requirements of the curriculum. Courses in curriculum development, evaluation, teaching methods and student teaching would be the only courses which would need to be developed specifically for this program. These could be developed and

taught by one Agricultural Education Teacher. Ali Kassim, is currently in the U.S. obtaining a degree in Agricultural Education. He would be most qualified to give leadership to the development and implement of an Agricultural Education Program in the Faculty of Agriculture since he also has teaching and administrative experience at the ISAI.

2. Provide support for the planning of a Post-secondary Agriculture School System and the developing of the first school within this system. Based on the experience gained in the ISAI/AED Subproject, it is recommended that a study be conducted to determine the overall post-secondary education needs in the Agriculture Sector for the next 20 years. Based on this information a tentative plan should be made regarding the system which would need to be developed to serve the projected needs. Subsequently the first school within the system could be built and its educational program could be developed and implemented. Other parts of the system could be put in place over time as the need arises.

3. Provide support for the continual development and improvement of the existing secondary agricultural school system with particular emphasis on the Directorate for Agricultural Education Office. It is recommended that the current system be improved and more fully institutionalized before any expansion takes place. Limited support over the next 4-5 years could make a sufficient difference as to whether the program

developed and implemented under AED will be sustainable over time. Since the major functions of the National Office are critical to the successful operation of the entire system, it is recommended that particular attention be given to these activities.

The Republic of Yemen, through the ISAI/AED Project has built an excellent foundation for the development of a comprehensive agricultural education system it will need during the next to two to three decades.

AID, CID/NMSU and the MOE can be proud of what has been accomplished under the ISAI/AED. However, we are concerned as to the ability of the YAR to sustain the programs which have been developed without some continual support for the next four to five years.

In addition, it is imperative that Yemen develop its own indigenous capacity to provide pre-service and in-service for Agricultural teachers. Thus it is strongly recommended that Sana'a place emphasis on recommendations one and three in the near future. Once these two systems are functioning reasonably well, emphasis can be shifted to the development of a Post-secondary Agricultural Education System.

APPENDIX 1.0

Training and Employment, Academic and Non-Academic

APPENDIX 1.1

Academic Trainees by Degree and Location

	LOCATION		
DEGREE	**U.S.A.**	**EGYPT**	**TOTAL**
Ph.D	1	-0-	1
M.S.	11	18	29
B.S.	-0-	15	15
Total	12	33	45

TRAINING AND EMPLOYMENT REPORT

PARTICIPANT	DISCIPLINE	TRAINING				EMPLOYMENT					
		MS/US	BS/E	MS/E	PH. D.	IBB	SURDUD	VET	MOE	MOA	OTHER
ABDULLA AL-DUBAI	HORT/AXED	X				X					
ABDU AHMED MUKBIL	GEN. AG.		X						X		
ABDUL GALIL ABDUL-WALI	GEN. AG		X				X				
ABDUL KARIM AL-ASHWAL	AG. EXT.		X				X				
ABDUL KARIM QAIED AL-TAM	GEN. AG		X							X	
ABDUL KARIM SAEED KASSIM	AXED/EXT	X			* * *	X					
ABDUL RAHMAN SAIF MAKY	GEN. AG		X				X				
ABDULAZIZ MAHYOUB AL-WAHESH	AG. ED			*							
ABDULBARI ABDULRUB	AG. ED.			X		X					
ABDULGELIL ALI SALEH	GEN. AG		X				X				
ABDULILAH OMAR AL-AGHBAR	AG MECH			X	* * *	X					
ABDULRAHMAN MOHD BISHR	GEN. AG		X				X				
ABDULRUB A. QADASI	AG. ED.			X						X/TDA	
AHMED ABDO SAIF	AXED/EXT	X				X					
AHMED IBRAHIM AL-SABRI	AXED/AN SCI	X				X					
ALI AHMED K. AL-SHOOGA	GEN. AG		X				X				
ALI HAMOUD ALI TAHER	GEN. AG		X				X				
ALI KASSIM ISMAIL	AXED	X			* *	X					
ASEEN SAIF OBAID	AG. ED.			*							
FUAD THABET AL-SAGIR	AG. ED.			*							
GAMAL ABDO SAAD	AG. ED.		X			X					
HASSAN KASSIM KHALIL	AG. ED.			*							
HAYEL HAIDER SALLAM MUGBIL	AXED/BEES	X							X		
HUSSEIN FARRA AL-MADHAJI	AXED/MECH	X							X		
ISMAIL RAHMAN AL-HADDAD	AG /SOILS			*		X					
JAMAL MOHD. RASSAM	AG/FOOD TEC			X		X					
KASSIM SAEED AL-MADHIGI	AG. ED.			*							
MANSOOR AHMED AL-HAWSHABI	AG ED/ECON	X			* * *	X					
MOHAMED ABDALLA AL-MONIFY	AG. ED.			X						X	
MOHAMED ABDU AL-LAWDHAI	AG. ED.		X				X				
MOHAMED ABDULHABIB RADMAN	AG. ED.			*							

APPENDIX 1.2

TRAINING AND EMPLOYMENT REPORT

PARTICIPANT	FIELD	TRAINING				EMPLOYMENT					
		MS/US	BS/E	MS/E	PH. D.	IBB	SURDUD	VET	MOE	MOA	OTHER
MOHAMED SALEM HAIDER	AG. ED.	X				X					
MORTADA IAHER YAZIM SALEM	GEN. AG.		X				X				
MUTAHER SARAFAF SHAIBAN	AG. ED.			*							
NABIL ABDULKARIM AL-ANSI	AG. ED.			X						X	
NAJi MOHAMED SAIF IBRAHIM	GEN. AG		X			X					
SAIF ABDUL OTHMAN	GEN. AG.			*							
SALEH ABDALLA MOTHANA	AG/EXT			*							
SALEH MOHAMED OTHMAN	AG/HORT			*		X					
TAHA YASSIN AL-ANEENI	AG. MECH	X									FOA
TAWFIK SAIF AHMED ABDALLA	AG/ECON		X					X			
MOHAMED ABDULLA OTHMAN	AGRI.			*							
YASSIN THABIT SALIA	GEN. AG.		X								X
HASSAN DEBWAN	AG. ENGR.	X							X		
TOTAL PARTICIPANTS		11	15	18	1						
TOTAL TEACHING STAFF						14	9	2	5	4	2

X PROGRAM COMPLETED
* MS PROGRAM IN PROGRESS
** (AED) PH.D. PROGRAM IN PROGRESS
*** FORMER AED/ISAI MS PARTICIPANTS AND TEACHERS
Three (3) Sponsored by C/Core & WB/World Bank

STATISTICS AS OF 9/30/90
AED Final Report
11/19/90/mr

41

NON-ACADEMIC TRAINING

NON-ACADEMIC TRAINING FIELDS	WEEKS	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
UNITED STATES												
AGRICULTURAL EXTENSION EDUCATION	8	8	10	10	11	14	3	2	1			
AUDIO VISUAL EQUIP & MAINTENANCE	5						1					
EDUCATIONAL MANAGEMENT/SUPERVISION	2					14	13	18	10	13	2	
AUDIO VISUAL WORKSHOP	2					8						
FARM MECH./WELDING/CARPENTRY/SURV	6							1	1			
ARTIFICAL INSIMINATION/ANIMAL PROD.	4							1				
HORTICULTURE	4							1				
FOOD PROCESSING	4							1				
TEACHING METHODOLOGY/TECHNIQUES	6	8	7	7	10	14	10	12	10	13		
FARM MECHANIZATION	6						1	1	1	1		
POST SECONDARY INSTITUTIONS	3						4		2		2	3
EDUCATIONAL MATERIALS DEVELOP	2	8					10	12	10	13		
VOCATIONAL EDUCATIONAL SYSTEMS	3					8	10	12	10	13	2	
CURRICULUM DEVELOPMENT	2	8		10	11	14	10	12	10	13		
BEEKEEPING	4							1	4			
THIRD COUNTRY TRAINING												
VOCATIONAL EDUCATIONAL SYSTEMS	2						6		6			
PRINTING PROCESSES/RESOURCES	1						2	2			2	
TEXT BOOKS/ARABIC RESOURCES	2							2			2	2
MS PRACTICAL/VARIOUS DISCIPLINES	4						5	3	5	1	2	
YEMEN - IN-COUNTRY												
CURRICULUM	4		6		5			30	28	30	52	45
EDUCATIONAL ADMINISTRATION	4	1	1	1	1	1	2	2	3	3	3	3
FISCAL MANAGEMENT	3		1	1	1	1	2	2	3	3	3	3
INSTRUCTIONAL MATERIAL DEVELOPMENT	4					4	6	8	8	8	8	10
TEACHERS IN-SERVICE WORKSHOPS	2		6		7		13	15	12	18	25	18

NON-ACADEMIC TRAINING

NON ACADEMIC TRAINING FIELDS	WEEKS	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
YEMEN IN-COUNTRY (CONTINUED)												
INVENTORY PROCEDURES/SYSTEMS	2				1	1	1	2	1	1	6	6
SCRANTON TEST SCORING WORKSHOP	1						15	8	12	10	6	6
SMALL GASOLINE ENGINES	2				1	1	3	3	6	11	3	1
FORAGE SYSTEMS AND IRRIGATION	2				1	1	1	3	5	7	10	2
FARM MANAGEMENT	4		1	1	1	1	1	2	2	2	2	1
PASTURE MANAGMENT/FORAGE	4				1	1	2	2	2	6	2	1
FARM MACHINERY AND EQUIPMENT MAINT	4		1	2	2	2	2	3	4	4	2	1
AUTO MECHANICS	4		1	1	1	1	2	2	2	15	3	1
LIBRARY CATALOGING/PROCEDURES	2						2	2	2	3	3	3
COMPUTER USAGE	2					1	2	2	2	2	3	28
EXTENSION OUTREACH PROGRAMS	4		5	8	30	25	70	60	20	15	25	
BEEKEEPING	2			20	30	15	5	25	30	10	25	
POULTRY EQUIPMENT	2		2	1	15	1	1	1	2	2	1	
PLANTING	2		5	3	3	3	3	15	15	15	10	1
SPRAYING	2				1	1	1	1	1	4	3	
ARC/OXY WELDING TECHNIQUES/SAFETY	2			3	5	8	4	10	15	10	8	2
WELDING TECHNIQUES & SAFETY	2				2	2	2	10	15	10	8	
SMALL ENGINES/MAINTENANCE	2			1	1	1	1	1	1	1	1	
PLUMBING	2						1	1	1	3		

NON-ACADEMIC TRAINING

NON ACADEMIC TRAINING FIELDS	WEEKS	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
WOMEN'S PROGRAMS												
UNITED STATES												
BEEKEEPING	6				3							
THIRD COUNTRY												
WOMEN'S EDUCATIONAL PROGRAMS/ RESOURCES, MOE STRUCTURE	3											2
YEMEN - IN-COUNTRY												
OUTREACH PROGRAMS/ISAI	2											
HOME ECONOMICS/FOOD PROCESSING	1					21	32	26	29	15	33	
POULTRY	1				10	11	18	9	13	20	30	
BEEKEEPING	1							5	10	10	30	
HORTICULTURE	1					5	5	5	5	10	30	
AUDIO VISUAL	2						30			5	5	30
EXTENSION	2			25	21	40	57	50	30	21	27	
ANIMAL PRODUCTION/VET.	2								5	10	30	
EDUCATIONAL MANAGEMENT	2										2	60
CURRICULUM	2										1	60
INVENTORY SYSTEMS/CONTROL	1								1	1	1	1
COMPUTER TRAINING	2									1	1	5

AED FINAL REPORT
DATE PREPARED 11/90 MR

APPENDIX 2.0

Textbooks and Instructional Units Developed

APPENDIX 2.1

Summary of Books Developed

TITLES

1. Surveying, Practical 1st Year
2. Surveying, Theoretical 1st Year
3. Workshop, 1st Year
4. Agricultural Mechanics, Tractors & Engines
5. Agricultural Mechanics, Theoretical 3rd Year
6. Crops, 1st Year
7. Crops, 2nd Year
8. Crops, 3rd Year
9. Soils, 2nd Year
10. Soils, 3rd Year
11. Agricultural Extension, Theoretical 3rd Year
12. Agricultural Extension, Practical 3rd Year
13. Agricultural Extension, Theoretical 2nd Year
14. Agricultural Extension, Practical 2nd Year
    (to be divided between 1st and 2nd year)
15. Agricultural Accounting, Practical
16. Food Technology, Practical
17. Animal Production, Practical

APPENDIX 2.2

Summary of Instructional Units Developed

1.0.0 **Animal Production**

1.1.0 **First Year**

1.1.1 Introduction to Animal Livestock
1.1.2 Local and International Sheep & Goat Breeds
1.1.3 Methods of Animal Control
1.1.4 Livestock Farm Operations
1.1.5 Veterinary Activities Related to Animal Care
1.1.6 Locomotive Systems
1.1.7 Digestive Systems
1.1.8 Excretory Systems
1.1.9 Nervous Systems
1.1.10 Respiratory Systems
1.1.11 Circulatory Systems
1.1.12 Reproduction Systems

1.2.0 **Second Year**

1.2.1 Housing
1.2.2 Hatching
1.2.3 Incubation
1.2.4 Records
1.2.5 Artificial Insemination
1.2.6 Characteristics of Broiler & Layer Hens
1.2.7 Evaluation of Animals & Exhibitions

1.3.0 **Third Year**

1.3.1 Delivery & Young Animal Care
1.3.2 Milk Production (Milking Methods)
1.3.3 Layer Hens
1.3.4 Meat Production
1.3.5 Budgeting for a Livestock Farm

2.0.0 **Horticulture**

2.1.1 **First Year**

2.1.1 Introduction to Horticulture
2.1.2 Selection & Construction of a Horticulture Nursery
2.1.3 Horticulture Plant Propagation
2.1.4 Planting Trees, Shrubs, & Vegetables
2.1.5 Construction of an Orchard
2.1.6 Planting of Lawns

2.2.0 **Second Year**

2.2.1 Care for Horticulture Crops
2.2.2 Production of Special Species of Horticulture Plants
2.2.3 Production of Plant Vegetable Seeds
2.2.4 Cultivation of Popular Fruit Crops in Yemen
2.2.5 Cultivation of Popular Vegetable Crops in Yemen
2.2.6 Cultivation of Popular Ornamental Plants in Yemen
2.2.7 Selection & Distribution of Propagation Fruit Trees

2.3.0 **Third Year**

2.3.1 Selection and Cultivation of High Quality Vegetable Crops
2.3.2 Cultivation of Popular Vegetable Crops in Yemen
2.3.3 Best Methods of Harvesting Fruit Trees & Vegetable Crops
2.3.4 Storing & Marketing of Fruits & Vegetables
2.3.5 Designing & Cultivating Ornamental Gardens
2.3.6 Flower Arranging
2.3.7 Artificial Ripening of Some Fruit Crops
2.3.8 Designing & Exhibition for Flowers & Ornamental Plants
2.3.9 Production of Ornamental Plants in Yemen

3.0.0 **Soils**

3.1.0 **First Year**

3.2.0 **Second Year**

3.2.1 Types of Rocks & Minerals
3.2.2 Soil Organic Matter
3.2.3 Soil Formation
3.2.4 Physical Properties of Soil
3.2.5 Chemical Properties of Soil
3.2.6 Soil pH

3.2.7 Weathering Process and Factors Affecting It
3.2.8 Classification of Soil

3.3.0 **Third Year**

3.3.1 Nutrient Elements
3.3.2 Organic Fertilizers
3.3.3 Soil Surveying
3.3.4 Soil Erosion
3.3.5 Land Reclamation

4.0.0 <u>Crops</u>

4.1.0 **First Year**

4.1.1 World Crops and Their Distribution & Classification
4.1.2 Most Important Winter Crops in Yemen
4.1.3 Identification of the Most Important Summer Crops in Yemen
4.1.4 Identification of Field Crops in Yemen
4.1.5 Most Popular Field Crops in Yemen
4.1.6 Most Popular Field Crops in the World and Their Classification
4.1.7 Service (Maintenance) Operations
4.1.8 Harvesting
4.1.9 Identification of Harvesting and Thrashing Equipment

4.2.0 **Second Year**

4.2.1 Summer Fiber Crops (Cotton)
4.2.2 Summer Cereal Crops
4.2.3 Threshing & Silage
4.2.4 Summer Oil Crops
4.2.5 Summer Sugar Crops
4.2.6 Other Crops (Tobacco)
4.2.7 Harvesting
4.2.8 Summer Field Crops (Alfalfa and Sudanese Grass)

4.3.0 **Third Year**

4.3.1 Seeds
4.3.2 Weeds
4.3.3 Grazing

5.0.0 **Agricultural Mechanization**

5.1.0 **First Year**

5.1.1 Carpentry
5.1.2 Cutting, Fitting & General Repair
5.1.3 Welding
5.1.4 Electricity
5.1.5 Plumbing
5.1.6 Use of Surveying Tools
5.1.7 Land Surveying
5.1.8 Land Measurements & Drawing Farm Maps

5.2.1 **Second Year**

5.2.1 Electric Motors
5.2.2 Gasoline & Diesel Motors
5.2.3 Overhaul Small Gasoline Engines
5.2.4 Adjusting of the Carburetor
5.2.5 Tractor Maintenance
5.2.6 Driving & Operations of Tractors

5.3.0 **Third Year**

5.3.1 Preparation Equipment
5.3.2 Seeding & Cultivation Equipment
5.3.3 Growing Crops Maintenance Equipment
5.3.4 Harvesting Equipment
5.3.5 Selection of Farm Equipment

6.0.0 **Food Technology and Dairy**

6.1.0 **First Year**

6.2.0 **Second Year**

6.2.1 Scales
6.2.2 Sugar & Salt Crops
6.2.3 Food Preservation by Heat
6.2.4 Canning
6.2.5 Smoking
6.2.6 Freezing
6.2.7 Drying
6.2.8 Food Preservation by Natural Additives

6.2.9 Juice
6.2.10 Preparation of Flour & Dough

6.3.0 **Third Year** (Dairy)

6.3.1 Basic Dairy Tests
6.3.2 Milk Preservation Methods
6.3.3 Milk Industries

7.0.0 **Agricultural Extension**

7.1.0 **First Year** (Rural Sociology)

7.1.1 Concept of Rural Sociology
7.1.2 Basic Sociological Concepts
7.1.3 Population
7.1.4 Surveying the Rural Community
7.1.5 Social & Technological Change
7.1.6 Rural Developemnt
7.1.7 Planning Extension Programs

7.2.0 **Second Year** (Agricultural Extension)

7.2.1 Agricultural Extension Concepts
7.2.2 Adult Education
7.2.3 Theoretical Principles of Extension Methods
7.2.4 Individual Teaching Methods
7.2.5 Group Teaching
7.2.6 Mass Communications
7.2.7 Practical Demonstrations
7.2.8 Rural Leadership
7.2.9 Audio Visual Aids

7.3.0 **Third Year**

7.3.1 Extension Organizations
7.3.2 Program Planning and Plan of Work
7.3.3 Program Evaluation
7.3.4 Factors Affecting Extension Work in Yemen

8.0.0 **Economics and Farm Management**

8.1.0 **First Year**

8.1.1 Definition of Agri. Economics

8.1.2 Basic Economic Activities
8.1.3 Basic Concepts & Economic Principles
8.1.4 Cooperation & Its Principles
8.1.5 Cooperative Management
8.1.6 Cooperative Movement in Yemen

8.2.0 **Second Year** (Agricultural Accounting)

8.2.1 Concepts, Principles & Objectives of Accounting
8.2.2 Accounting Books
8.2.3 Budgets & Final Accounts

8.3.0 **Third Year** (Farm Management)

8.3.1 Definitions of Farm Management
8.3.2 Types of Farms
8.3.3 Steps of Farm Management
8.3.4 Production Cost
8.3.5 Production Efficiency
8.3.6 Concept of Marketing & Its Function
8.3.7 Agricultural Marketing in Yemen

9.0.0 **Plant Protection**

9.1.0 **First Year**

9.2.0 **Second Year**

9.2.1 Identification of Plant Protection & Loss Due to Insects & Plant Disease
9.2.2 Insects & Disease Collections of Plants
9.2.3 Morphology of Insects
9.2.4 Dissection of Insects
9.2.5 Insect Classification
9.2.6 Insect Life Cycles
9.2.7 Identifying & Applying of Resistance Methods to Plant Diseases & Insects
9.2.8 Quarantine Regulations

9.3.0 **Third Year**

9.3.1 Use & Maintenance of Equipment Used in Plant Protection

10.0.0 **Bee Keeping**

10.1.0 **First Year**

10.2.0 **Second Year**

10.3.0 **Third Year**

10.3.1 Introduction
10.3.2 Members of the Bee Kingdom
10.3.3 Construction of Apiaries
10.3.4 Bee Keeping Operations
10.3.5 Source of Honey Forage Plants & Pollen Forage Plants
10.3.6 Policy for Developing Bee Keeping in Yemen

APPENDIX 3.0

Facility Improvement and Procurement Summary

APPENDIX 3.1

Facilities Improvement by School

School	Instructional Area	Type of Improvement
IBB	Animal Science	Construction of dairy sheds
		Installation of a complete milking system
		Reworking of small animal facilities
		Instllation of bulk feed handling facilities
		Fencing of pastures
		Construction of a concrete and dirt silo
		Artificial insemination equipment and methods
	Agricultural Mechanics	Shop improvement
		Equipment for shop instruction
		Equipment for farm maintenance programs
		Construction of storeroom for parts
	Agronomy, Soils and Field Crops	Installation of a soils testing lab
		Production of improved varieties of grasses
		Pasture fencing
		Installation of pasture irrigation systems
		Haying equipment
		Irrigation for student and demonstration plots
		Silage cutting and handling equipment
		Installation of irrigation well
	Beekeeping	Development of an apiary
	Food Processing	Equipping the food processing laboratory
		Installation of complete canning line
		Food processing equipment

	Horticulture	Renovation of greenhouse Construction of shade house Development of apple tree nursery Development of apple orchard Installation of irrigation systems Importation of various plant material
Surdud	Agricultural Mechanics	Equipment for shop instruction and machinery maintenance
	Agricultural Mechanics, Livestock	Construction of instructional farm shop Equipment for shop instruction Equipment for farm maintenance
	Agronomy, Soils Field Crops	Installation of flood and sprinkler and irrigation plots Silage cutting equipment Development of student and demonstration plots Renovation of irrigation well
	Agronomy, Soils Crops	Instillation of flood and sprinkler and irrigation plots Development of small forage plots
	Animal Science	Construction of dairy sheds Construction of a concrete silo
	Beekeeping	Development of an apiary
	Food Processing	Small equipment and supplies for food processing Honey processing laboratory
	Horticulture	Installation of irrigation systems Importation of various plant material Construction of greenhouse Construction of shade house Development of propagation plots Installation of irrigation systems

Sana'a	Livestock	Renovation of the dairy barn and milk equipment Equipping veterinarian lab Installation of livestock watering facilities Duck raising facilities

APPENDIX 3.2

Procurement Summary

Type of Equipment/Supplies	Dollar Value
Instructional Equipment and Supplies*	407,077
Farm Machinery and Supplies*	725,000
Office Equipment and Supplies	100,500
Equipment and Compound Maintenance	455,000
Total	1,687,577

* Includes repair and replacement parts

APPENDIX 4.0

Outreach Training Programs by the

Secondary Agricultural Institutes

APPENDIX 4.1

Outreach Training Programs

The Outreach Program was developed to free the schools from the traditional outlook of teaching techniques. It was envisioned that the graduates would be involved in some facet of the Yemen governmental extension programs. As an institute set up for teaching purposes, the production of graduates who were familiar with working in the field with farmers was essential.

The Outreach Program also enables the Institute to react to the educational and technical needs of other developmental projects. Through this program, the schools can cooperate on developing agricultural goals of the nation. This program enables the school to interact with the surrounding communities. This, no doubt, enriches the learning experiences of the students. Through such a program, students are exposed to a number of projects and agricultural establishments. This enlarges the base of employment after graduation.

The Outreach Program of the Secondary Agricultural Schools has three main types of activities:

A. <u>Training Programs for Other Developmental Projects</u>

The schools take part in training personnel (especially extension workers) for other projects. In terms of the training activities, the IBB School has by far been the leader in this type of activity. This has particularly been due to its longer length of existence and its more central location.

Some of the major training activities include:

A joint training program with the Institute of Public Administration and UNESCO. This program involved 17 projects and Institute administrators. The major theme of the course was the administration of developmental projects and institutes.

A summer-long training course was a specialized course in the area of food technology. This course was conducted for the Surdud projects newly recruited extension home economists by the IBB food technology teachers.

Poultry training for staff and employees of the CID/PETS Poultry Project.

Training of Ministry of Agriculture and various other project personnel in the area of beekeeping.

Outreach Training activities have been mainly confined to extension workers of three developmental projects. These projects are Surdud, Rada Integrated Rural Development Project (RIRDP), and Tehama Development Authority (TDA).

B. Consultation and Technical Services to Other Projects

Consultation and technical assistance is the area where the schools maintain contact with other developmental projects. Consultation is normally done through exchange visits between ISAI staff and other project staff.

In early stages of the project funds were provided to the Yemen teaching staff for such visits. This funding was a way of having staff build relations that would assist the school in training sites for school activities. Although money is no longer

available from the project, most staff still maintain contact with other agricultural agencies on a professional basis.

C. Demonstrations (On and Off Farm) and Other Community Services

Farmers of the area communities are invited for field days conducted at the IBB school. Demonstrations of crops or specific agricultural practices are displayed for farmers to view and obtain information on. The IBB School has been the only school that has conducted this type of field day activity due to several reasons. One, Surdud is in a very remote area, and the livestock school is in a non-agricultural area. Field day activities at IBB have included:

Crop demonstrations
- Corn
- Potatoes
- Vegetables
- Fruit trees

Corn planting
Potato harvesting
Drip irrigation
Sprinkler irrigation
Mechanical rock removal
Food processing
Silage production
Production of hay

Other types of programs have included:

The Livestock School students working with the British veterinary project vaccinating animals in the Tehama region.

Surdud School students obtaining agricultural data for the Ministry of Agriculture.

The Livestock School providing veterinary service to large animal in the Sana'a area.

The IBB School veterinarian providing rural veterinary service in the surrounding communities.

A specialized outreach program was conducted in 1982-83 following a major earthquake in Yemen. The United States provided assistance to Yemen during this time, as the AED Project was asked to provide specialized expertise in the area of beekeeping. A beekeeping specialist was employed and an outreach program developed in the Dhamar area.

Eighty local hives of bees were purchased and from these some 500 hives were produced at the IBB School. A Kenya type hive was selected as the most appropriate for Yemen and the units were constructed in the IBB School shops.

Training programs for all aspects of beekeeping were developed and conducted in the IBB and Dehmar areas. The training involved both men and women in areas ranging from queen rearing to hive construction. Students and staff were used in as many of the activities as possible.

APPENDIX 5.0

School Enrollment Summary

APPENDIX 5.1

Summary of Student Enrollment from 1979 to 1989 by School

Number of Students Admitted and Graduated by School

	IBB		Surdud		Sana'a Vet.	
Year	Admitted	Graduates	Admitted	Graduates	Admitted	Graduates
1979/80	53	-	-	-	-	-
1980/81	23	-	-	-	-	-
1981/82	32	48	30	-	-	-
1982/83	47	28	24	-	11	-
1983/84	33	34	18	30	22	-
1984/85	28	34	22	24	14	7
1985/86	41	29	36	17	27	16
1986/87	79	16	63	21	11	10
1987/88	85	20	55	31	24	16
1988/89	55	69	31	57	34	19
1989/1990	80	58	60	54	40*	17

* Includes 20 Livestock and 20 agricultural Science

APPENDIX 6.0

Technical Assistance Summary

Long- and Short-Term

APPENDIX 6.1

Person Months of Long Term Technical Assistance

by Position

LONG-TERM	Person Months	
A. U.S.A. Staff		
Team Leader	127	
ESL Instructor	72	
Farm Manager	103	
Administrative Assistant	19	
Total Expatriate P/M		321
B. Third Country Professional		
Agronomist	63	
Ag Ext./Rural Sociology	73	
Horticulturalist	84	
Food & Dairy Science	96	
Animal Production	81	
Ag. Mechanization	61	
Extra Curricula	24	
Beekeeping Specialist	24	
Total Third Country Prof P/M		506
Total Person Months of Long Term Technical Assistance		827

APPENDIX 6.2

Inputs

STAFF POSITION	WP/1 1980	WP/2 1981	WP/3 1982	WP/4 1983	WP/5 1984	WP/6 1985	WP/7 1986	WP/8 1987	WP/9 1988	WP/10 1989	T/9/30 1990
Team Leader	X	X	X	X	X	X	X	X	X	X	X
Extra Curi	X	X									
Animal Sci	X	X	X	X	X	X	X				
Extension	X	X	X	X	X	X	X				
Horticulture	X	X	X	X	X	X	X				
Ag Mechanics	X	X	X	X	X	X					
Agronomy/Soils	X	X	X	X	X						
Farm Manager	X	X	X	X	X	X	X	X	X		
English		X	X	X	X	X	X				
Food Process		X	X	X	X	X	X	X	X		
Beekeeping			X	X	X	X					
Team Lead Asst										X	X

APPENDIX 6.3

Long Term Contractor Personnel

USA and Third Country Professionals

Dr. Arthur Jensen	Team Leader	2/06/80	2/06/82
Dr. Robert Martin	Team Leader	2/03/82	4/01/84
Dr. Everett Edington	Team Leader	3/20/84	5/01/86
Dr. Warren Noland	Team Leader	4/11/86	4/15/88
Dr. Sunny Langham	Team Leader	4/11/88	8/16/90
Amin Abusha'er	Agronomy	4/12/80	7/31/85
Dr. Khairy Aboul-Seoud	Ag. Ext./Rural Soc.	6/10/80	7/31/86
Musa Allagabo	Horticulture	1/01/80	12/31/86
James Bame	ESL Instructor	2/13/85	6/30/86
Dr. Mohamed El-Gharbawi	Food & Dairy Tech.	1/01/82	11/30/88
Awadalla Hamid	Animal Production	11/01/79	7/31/86
Gassim Hassan	Agricultural Mechanics	6/01/80	7/31/85
Jan Karpowicz	Beekeeping Spec.	3/19/83	3/31/85
Mary Reynolds	Team Leader Assistant	2/25/89	9/30/90
Nasr Rohaiem	Extra-Curriculum	9/01/79	9/22/81
Carlos Rosencrans	Farm Manager	11/07/84	7/28/87
Craig Runyan	Farm Manager	1/15/82	11/25/84
Don Swanjord	ESL Instructor	9/08/81	7/31/85

APPENDIX 6.4
AED TDY SUPPORT 79-90

TDY STAFF	ADMIN. PROG. COORD.	AXED & EDUC.	CONST./ MAINT./ AG ENGR	AUDIO VISUAL COMPT	HORT. & BEE-KEEPING	AGRO/ ANIM. PROD.	FISCAL & EQUIP INVENT.	FARM & AUTO MECHAN.	CURRI TEXT BOOKS	TOTAL PM
1979										
MATTESON	4	2							2	2.00
BERGSMA		2							2	1.00
BEACH	2		1							0.75
KHAIDI		2							2	1.00
1980										
MATTESON	1								1	0.50
LANGHAM	1	1	30							8.00
MUCKLEROY			16							4.00
ISAACS			4							1.00
1981										
HOLLAND		6								1.50
BRISTOL							4			1.00
MUCKELROY			10							2.50
LANGHAM			20							5.00
MATTESON	5	2							2	2.25
SNODGRASS						4				1.00
1982										
MATTESON	5	3							2	2.50
LANGHAM	1		11							3.00
JAYCOX					4					1.00
MUCKLEROY			4							1.00
DEAN								4		1.00
REYNOLDS	1						2			0.75
HAMILTON			9							2.25
										0.00
1983										0.00
ROSS	1	1							1	0.75
LANGHAM	4	3							1	2.00
MATTESON	2	2								1.00
ABERNATHY			4							1.00
JAYCOX					6					1.50
SPELLENBERG						4				1.00
REYNOLDS							6			1.50
1984										
LANGHAM	2	1							1	1.00
JAYCOX					4					1.00
MCELROY						4				1.00
KENNON									8	2.00

AED TDY SUPPORT 79-90

TDY STAFF	ADMIN. PROG. COORD.	AXED & EDUC.	CONST./ MAINT. AG ENGR	AUDIO VISUAL COMPT	HORT. BEE- KEEPING	AGRO. ANIM. PROD.	FISCAL & EQUIP INVENT.	FARM & AUTO MECH	CURRI TEXT BOOKS	TOTAL PM
1985										
NOLAND	5									1.25
MATTSON										
FICKLIN, JIM				4						1.00
FICKLIN, JO				4						1.00
REYNOLDS							6			1.50
ROSS	1	1								0.50
MATTESON										
FANCHER	4									1.00
PETTIBONE	4									1.00
1986										
DEAN								7		1.75
FANCHER	2									0.50
MASTERS			12							3.00
BERGSMA	1	1							1	0.75
MATTESON	1	1							1	0.75
1987										
BERGSMA										
MATTESON	2	2								1.00
SHANER	8									2.00
REYNOLDS							8			2.00
ABOUL-SEOUD										
1988										
MATTESON	1	1							1	0.75
LANGHAM	2									0.50
REYNOLDS							8			2.00
GALVAN									7	1.75
MCVEY	5									1.25
1989										
HAMILTON			5							1.25
MATTESON	2	2								1.00
ABOUL-SEOUD									6	1.50
1990										
TREGEAR				4						1.00
MONTOYA				5						1.25
BAWAZIR			6	1				1		2.00
ABOUL-SEOUD									6	1.50
MATTESON	1	1							1	0.75
TOTAL PM										922.50

APPENDIX 7.0

Financial and Inventory Summary

YEMEN PROJECT/WORKPLAN #1-10
CUMULATIVE REPORT

CATEGORIES	WORK PLAN I 1-4-22719/20	WORK PLAN II 1-4-22721/22	WORK PLAN III 1-4-22723/24	WORK PLAN IV 1-4-22730/31	WORK PLAN V 1-4-22741/42	WORK PLAN VI 1-4-22758/59	WORK PLAN VII 1-4-22725/26	WORK PLAN VIII 1-4-22734/35	WORK PLAN IX 1-4-22744/45	WORK PLAN X 1-4-22750/51	TOTALS
Salaries											
On-Campus	$101,747.66	$115,359.33	$159,223.87	$103,671.21	$131,007.33	$113,606.60	$81,825.32	$103,045.82	$48,695.02	$72,871.98	$1,031,054.14
Off Campus	$256,628.90	$296,170.82	$556,886.61	$472,001.42	$446,862.16	$405,303.26	$175,793.85	$167,570.90	$102,186.31	$86,226.01	$2,965,630.24
Fringe Benefits	$32,741.31	$50,965.89	$103,378.17	$123,373.75	$95,207.96	$109,459.83	$61,899.87	$61,524.90	$33,918.89	$32,408.63	$704,879.20
Allowances	$1,750.00	$19,376.68	$63,171.99	$29,137.69	$7,982.04	$7,344.73	$31,962.86	$31,524.15	$32,602.79	$42,850.04	$267,702.97
Participant Training	$0.00	$74,943.91	$219,958.74	$127,496.12	$98,864.67	$115,330.93	$37,341.13	$127,539.95	$34,261.67	$24,552.00	$860,309.12
English Training	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Travel/Per Diem/Transport	$90,073.85	$79,694.36	$73,968.45	$44,524.38	$82,200.16	$41,281.10	$36,339.41	$42,242.52	$36,020.75	$40,719.18	$567,064.16
Expendable Supplies	$43,970.00	$49,613.63	$41,893.20	$36,404.04	$110,617.68	$104,197.29	$73,136.49	$103,011.53	$49,692.36	$75,376.25	$687,912.47
Non-Expendable Supplies	$7,292.57	$15,301.25	$128,920.68	$118,051.63	$23,714.24	$80,398.75	$51,886.64	$64,188.99	$87,489.76	$45,375.96	$622,620.47
Trailers	$473,674.63	($91,311.80)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$382,362.83
Transport	$318,315.98	$39,180.91	$148,143.33	$22,262.20	$14,916.77	$82,093.64	$95,682.30	$113,589.89	$44,242.29	$49,149.00	$927,576.31
Other Direct Costs	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$9,705.97	$10,913.01	$20,618.98
SUBTOTALS	$1,326,194.90	$649,294.98	$1,495,545.04	$1,076,922.44	$1,011,373.01	$1,059,016.13	$645,867.87	$814,258.65	$478,815.81	$480,442.06	$9,037,730.89
Indirect Costs	$278,662.12	$232,975.18	$300,890.60	$246,006.23	$221,739.79	$193,649.29	$110,776.59	$207,375.25	$117,068.18	$138,382.06	$2,047,525.29
TOTALS EXPENDED	$1,604,857.02	$882,270.16	$1,796,435.64	$1,322,928.67	$1,233,112.80	$1,252,665.42	$756,644.46	$1,021,633.90	$595,883.99	$618,824.12	$11,085,256.18

APPENDIX 7.1

APPENDIX 7.2
AED PROJECT INVENTORY

EQUIPMENT	VENDOR/MODEL	TAG NO.	QUANITY	AMOUNT *
MOBIL HOMES	VIRGINIA HOMES	457-465	9	239,546
CONTROL, WATER LEVEL	NU-MATIC		1	767
GENERATOR, CAT.		469	1	17,810
TANKS, WATER		662/663	2	3,171
GENERATOR, PORTABLE	DAYTON	538	1	1,295
FUEL TANK		670	1	5,286
CONTROL, WATER LEVEL	NU-MATIC	540	1	765
MIXER, CEMENT		559	1	991
PUMPS, WATER	CRANE-DEMING	739-741	3	2,590
CIRCUIT BREAKER	WESTINGHOUSE	668	1	918
TANKS, PENUMATIC		665-666	2	4,370
WELDER, ARC	MILLER	537	1	1,800
GENERATOR, CARBIDE		549	1	762
BOXES, ELECTRICAL	WESTINGHOUSE	673-674	2	4,100
CIRCUIT BREAKER BOX	WESTINGHOUSE	667	1	1,350
BLADE, 3.0,	IMCO	675	1	800
CUTTER, BRUSH ROTARY	COMMANDO		1	1,498
COPIER	MINOLTA	456	1	3,595
CRANE, FLOOR	THERN	702	1	1,008
SCALE, PLATFORM	PAUL, INC.	.1006	1	992
GRINDER, BENCH	BALDOR-PEUGOT	703	1	770
FORAGE, GAS	AMERICAN FURNACE	700	1	536
BRUSH CHIPPER	DIADEM/NASCO	1014	1	1,940
MILKER, ELEC. PORTABLE	AMERICAN INTERNA.	1008	1	2,039
PUMP, PORTABLE	AM. INTERNATIONAL	1009	1	1,084
COPYETTE	TELEX	1015	1	867
STENCIL MAKER	A. B. DICK	696	1	1,625
TESTER, CLIPPER	SEEDBURO EQUIP.	1029	1	925
CULTIVATOR	BRINLEY	676	1	525
HITCH, TILLER, 3.0	HOWARD	621	1	785
MOWER, 48"	SIERRA	677	1	575
SAW, TABLE	BOICE CRANE	707	1	1,877
SAW, RADIAL ARM	ROCKWELL	708	1	574
TRACTOR, 18 HP	POWER KING	585	1	3,675
SHELF UNIT	MCMASTER CARR	596	1	1,469
SPREADER, MANURE	INTERNATIONAL	598	1	3,498
MIMEOGRAPH	A. B. DICK	595	1	1,778
RECEIVER, COMMUNICATION	ELECTRONIC EQUIPMENT		1	705
LOADER FRAME	SIERRA	678	1	995
WASHER, GASOLINE	MCMASTER CARR	584	1	2,618
DUPLICATOR, SPIRIT	A. B. DICK	587	1	530
TRACTOR/MOTOR	RIKON	600	1	3,025

AED PROJECT INVENTORY

EQUIPMENT	VENDOR/MODEL	TAG NO.	QUANITY	AMOUNT *
VIDEO CASSETTE UNIT	CURTIS MATHIS	710-713	1	3,061
HARVESTER, FORAGE	NEW HOLLAND	599	1	5,200
PANELS	SKYLINE DISPLAYS	714-715	2	1,740
CLEANGER, PARTS	GRAINGER	583	1	640
LAB, LANGUAGE, PORTABLE	TELEX	1060	1	796
DIGGER, POST HOLE	FIVE STAR	640	1	665
SEPARATOR, CREAM	SCHLUETER	721	1	540
PROJECTOR, OPAQUE	BELESER	697	1	741
DUPLICATOR, TAPE	TELEX	1028	1	990
LEVEL, TRANSIT	LIETZ	602	1	715
LOADER, PAN	SIERRA	618	1	654
HAMMER MILL, 10"	SMALLEY	613	1	3,079
PROJECTOR	BUSINESS PRODUCTS		1	733
MILK RECEIVER	BOU-MATIC	1011	1	985
STORAGE BIN, GRAIN	BUTLER	748	1	977
CONTROL PANEL	BOU-MATIC	1010	1	906
TOOL BOX	MAC 900	633	1	503
SHREADER, 6"	COMMANDO	609	1	1,126
AUGER ASSEMBLY	STEELCON	747	1	950
STORAGE BIN, GRAIN	BUTLER	750	1	977
CARRIAGE ASSEMBLY	STEELCON	1026	1	877
HARROW, DISC	BRINLEY	842	1	842
HOIST	PICK-UM-UP	627	1	775
REFRACTOMETER	B&S	728	1	2,150
TRACTOR, GARDEN	TUFF-BILT	620	1	7,810
TRACTOR, CADET	INTERNATIONAL	614	1	4,914
TILLER, ROTARY, 48"	INTERNATIONAL	617	1	944
MOWER, SICKLE BAR	HABAN-RACINE	615	1	1,053
CABINET, TOOL	MAC	630	1	963
PROJECTORS, OVERHEAD	3M	716-719	4	2,096
COW, SOMSO	CAROLINA BIOLOGICA	1003	1	1,844
COMPUTER	VICTOR	612	1	2,995
PRINTER	EPSON	611	1	895
PROGRAM, COMPUTER	WORDSTAR	1002	1	715
LABEL MAKER, ELECTRIC	KROY	1015	1	695
PICKER, ROCK	WESTGO	656	1	1,750
LOADER, FRONT END	KWICH-WAY (KW)	659	1	1,485
SAW, BAND VERT/HORIZ	VANGUARD.	704	1	2,272
COMPUTER	RADIO SHACK		1	799
SHARP ALL	FOLEY-BELSON	634	1	892
PLOW	HESTER	660	1	1,299
MOWER, SICKLE BAR	KINCO	657	1	684

AED PROJECT INVENTORY

EQUIPMENT	VENDOR/MODEL	TAG NO.	QUANITY	AMOUNT *
BUCKET, 40"	SIERRA INTERNATIONAL	686	1	515
PUMP, VACUUM	BUO-MATIC/BECON	1007	1	1,495
TESTER, MILK , FAT	BABCOKC	722	1	675
METER, DIGITAL	MARKSON SCIENCE	1018	1	567
TRANSPARENCY MAKER	3M	661	1	840
SCALDER, ELECTRIC	PICKWICK	1004	1	548
SPECTROPHOTOMETER	B&L	1019	1	2,638
CABINET, HERBARIUM	LANE SCIENCE EQUIP.	709	1	585
VAT, CHESE MAKING	BROADWAY APPLIANCE	724	1	3,395
IMS RECORD./COMP PROG	COMPUTER CENTRAL	1001	1	850
CONTROL UNIT, HYD.	SIERRA INTERNATIONAL	738	1	1,350
BUCKET, STAB. ARMS	SIERRA INTERNATIONAL	686	1	1,125
RECORDER, VIDEO	CURTIS MATHIS	1016	1	599
DUPLICATOR	A. B. DICK	1062	1	515
PRESS, DRY MOUNT	SEAL	720	1	700
DICTAPHONE UNIT	DICTAPHONE	730	1	699
DICTATOR SYSTEM	DICTAPHONE	1022	2	1,450
DICTAPHONE UNIT	DICTAPHONE	729	1	530
LETTERING SYSTEM	3M	731	1	627
ENLARGER	BESELER	732	1	570
CARAMATE	TELEX	1040	1	750
FORAGE WAGON UNIT	JOHN DEERE	1053	1	3,778
WATER BATH	VWR SCIENTIFIC	1083	1	852
KETTLE, STEAM, 20 QT.	MCCOMAS SALES	1049	1	1,075
KETTLE, STEAM	MCCOMAS SALES	1048	1	1,695
SCRAPER, ECON	INTERNATIONAL	1052	1	625
RETORT, STEAM	DIXIE CANNER	1050	1	6,200
ELECTIRC SEALER	DIXIE CANNER	1054	1	1,087
THERMOX FAX	CANNON	1061	1	821
AUGER	HAYDENS	1070	1	714
FREEZER, NITROGEN	NASCO	1069	1	659
MOWER, ATTACHMENT	SIERRA INTERNATIONAL	1051	1	717
CABINETS, POSITION 6	VWR SCIENTIFIC	1088/89	4	2,071
SCANOPREG	NASCO	1068	1	649
MIXER, CEMENT	FARM AND FAMILY CO	1078	1	753
COW, TRAINING	KELVER	1045	1	3,635
TRAINER	UNIVERSAL	1046	1	1,758
TRUCK, 1986	G M C	1081	1	30,798
DISTRIBUTER, FERTILIZ.	SIERRA INTERNATIONAL	1100	1	1,375
DISC, OFFSET	TUFLINE	1079	1	3,350
MOWER, SICKLE BAR	KINKO	1071	1	877
REFRIGERATOR	NM STEEL	1101	1	586
COMPUTER	ZENITH DATA SYSTEM	1105	1	999

AED PROJECT INVENTORY

EQUIPMENT	VENDOR/MODEL	TAG NO.	QUANITY	AMOUNT *
COMPUTER, MACINTOSH	APPLE	1107	1	2199
COMPUTER, MACINTOSH	APPLE	1104	1	950
FREEZER	NM STEEL	1069	1	586
TEST SCORER, OMR	SCRANTON	1113	1	1,695
MOWER CONDITIONER	INTERNATIONAL HARVES	1139	1	6,625
TABLE, LABORATORY, SS	STAINLESS STEEL FAB.	1125/28	4	2,380
TABLE, LABORATORY, SS	STAINLESS STEEL FA	1123/24	2	1,250
SHELVES, SS	STAINLESS STEEL FA	1117/22	6	5,370
CLIPPER, SHEDDER	LINDLIG	1114/15	2	2,231
CULTIVATOR	LILLISTON	1147	1	2,180
BALER, HAY	CASE IH	1140	1	6,249
PULPER/FINISHER	LANGSENKAMP	1144	1	8,689
COMPUTER	APPLE	1134	1	1,995
CAMERA, VIDEO	MAGNAVOX	1032	1	1,095
CHUTE, SQUEESE	NASCO	1145	1	1,265
BIN, STORAGE	BUTLER	1152	1	1,300
INCUBATOR	SARGENT-WELCH	1143	1	2,010
PRINTER, IMAGEWRITER	APPLE	1133/34	1	718
AUGER SYSTEM	STEELCON	1152B	1	500
TILLERS, ROTARY	TROY-BILT	* *	2	2,323
STERLIZER	PRO-GRO EL	* *	1	803
FAN, EXHAUST	W. W. GRAINGER	* *	2	1,072
UTILITY VEHICLE	POLARIS	* *	2	5,490
TRACTOR	CASE, IH	* *	1	5,810
CUTTER VALVE	MAC TOOLS	* *	1	635
COMPUTER	MAC INTOSH/APPLE	* *	1	2,575
LASER WRITER/PRINTER	HEWLETT PACKARD	* *	1	3,815
SCANNER,	APPLE	* *	1	1,300
TRANSPARENCY MAKER	BUSINESS MACHINES	* *	1	1,029
PROJECTOR, OPAQUE	VU-LYTE	* *	1	662
TILLERS, ROTARY	TROY BILT	* *	2	2,323
TEST SCORER	SCRANTON	* *	2	3,390
PLOW	HESTER	* *	1	1,380
SPREADER, MANUER	CASE/IH	* *	1	3,375
LISTER, 5 BOTTOM	SIERRA INTERNATIONAL	* *	1	2,495
HITCH 3 POINT	MYERS	* *	1	1,400
UTILITY VEHICLE	POLARIS	* *	1	2,745
PROJECTOR	TROXELL COMMUNICA.	* *	1	665
MOVIE PROJECTOR 16MM	EIKI	* *	1	1,300
PLANTER, GRAIN DRILL	CASE INTERNATIONAL	* *	1	8,819
PRINTER, MIMEOGRAPH	A. B. DICK	* *	1	2,185
STENCIL MAKER	A. B. DICK	* *	1	1,695
TYPEWRITER, ELECTRIC	I.B.M.	* *	3	8,850

AED PROJECT INVENTORY

EQUIPMENT	VENDOR/MODEL	TAG NO.	QUANITY	AMOUNT *
COMPUTER	APPLE	* *	3	6,405
SCANNER	APPLE	* *	1	1,187
PRINTER	IMAGEWRITER	* *	3	2,719
MOWER, RIDING	HAYDENS	* *	1	1,300
PROJECTOR	EIKI	* *	2	1,564
MOWER, SICKLEBAR	KINCO MAFG.	* *	3	2,985
WELDER, GAS	MILLER	* *	3	6,360
TILLER, ROTARY	TROY BILT	* *	2	2,718
TILLER, POWER	KUHN	* *	1	1,485
PRINTER	LASER WRITER	* *	1	3,959
TRACTOR	CASE INTERNATIONAL	* *	3	18,177
BINDOMATIC	ROSEBACK PERFECT	* *	1	2,985
PLATE MAKER	A. B. DICK	* *	1	3,645
OFFSET PRESS	A. B. DICK	* *	1	7,730
CLEANER, CARPET	HAYDENS	* *	1	734
STENCIL MAKER & MIMEOG.	A. B. DICK	* *	4	7,702
TRANSPARENCY MAKER	TROXELL	* *	3	2,163
PAPER CUTTER	CHALLENGE	* *	1	4,227
COMPUTER	APPLE MAC	* *	1	3,116
COMPUTER	APPLE MAC	* *	1	2,220
HARD DISK	CMS	* *	1	1,020
PUMP	NU-SUPER	* *	1	1,300
ASSEMBLY, CLAW	NU-SUPER	* *	1	600
SPRAY TANK,	SIERRA	* *	1	1,060
COMPUTER	APPLE MAC	* *	1	4,159
HARVESTER, FORAGE	NEW HOLLAND	* *	2	17,900
HEAD, CORN ROW	NEW HOLLAND	* *	2	4,570
TABLE, HYDRAULIC	SHORLINE	* *	1	1,228
TABLE, HYDRAULIC	SHORLINE	* *	2	2,750

* LIST OF EQUIPMENT WITH A VALUE OF OVER $500 REPORTED
** PROPERTY TAGS NO LONGER ISSUED. EQUIPMENT IMMEDIATELY TRANSFERRED.

FINAL REPORT 11/90/MR

APPENDIX 8.0

List of Acronyms

APPENDIX 8.1

Acronyms

ADSP	Agricultural Development Support Program
AED	Agricultural Educational Development Project
ASA	Agricultural Sector Assessment
CID	Consortium for International Development
FAO	Food and Agricultural Organization
ISAI	Ibb Secondary Agriculture Institute
MAF	Ministry of Agriculture and Fisheries
MOE	Ministry of Education
M.S.	Master of Science
NMSU	New Mexico State University
Ph.D.	Doctor of Philosophy
RIRDP	Rada Integrated Rural Development Project
ROY/G/YARG	Republic of Yemen Government
TDA	Tihama Development Authority
TDY	Temporary Duty Assignment
TOEFL	Test of English as a Foreign Language
UN	United Nations
U.S.	United States of America
USAID	United States Agency for International Development
USAID/Y	United States Agency for International Development/Yemen
WB	World Bank