

PD-ABC-126

FINAL EVALUATION OF THE IBB  
SECONDARY AGRICULTURAL INSTITUTE (ISAI)  
SUB-PROJECT OF THE AGRICULTURAL  
DEVELOPMENT SUPPORT PROJECT (ADSP)  
(279-0052) IN THE REPUBLIC OF YEMEN

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Also see list of Persons Contacted (Annex 3).

## LIST OF ACRONYMS AND ABBREVIATIONS

ADSP	Agricultural Development Support Program
AED	Agricultural Education Development
AES	Agricultural Education System
CID	Consortium for International Development
COP	Chief of Party
CPO	Central Planning Organization
CSU	Colorado State University
DAE	Directorate of Agricultural Education
DAI	Development Alternatives
DI	Devres, Incorporated
EDSP	Education Development Support Program
FAO	Food and Agriculture Organization
FOA	Faculty of Agriculture
FFYP	First Five Year Plan
HITS	Horticulture Improvement and Training Sub-project
IBRD	International Bank for Reconstruction and Development
ISAI	Ibb Secondary Agricultural Institute
ISTI	International Science and Technology, Inc.
MAF	Ministry of Agriculture and Fisheries
MAWR	Ministry of Agriculture and Water Resources
MOE	Ministry of Education
MHE	Ministry of Higher Education
MOP	Ministry of Planning
NES	National Extension Service
NMSU	New Mexico State University
OICD	Office of International Cooperation and Development, USDA
PSAI	Post-Secondary Agricultural Institute
PACD	Project Agreement Completion Date
PDRY	People's Democratic Republic of Yemen
ROY	Republic of Yemen
SAE	Secondary Agricultural Education
SAI	Secondary Agricultural Institute
SAIS	Secondary Agricultural Institute System
SFYP	Second Five Year Plan
SOW	Statement of Work

## LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

SSAI	Surdud Secondary Agricultural Institute
SU	Sana'a University
SVS	Sana'a Veterinary School
TDA	Tihama Development Authority
UNIDA	United Nations Industrial Development Agency
USAID/W	United States Agency for International Development/Washington
USAID/Y	United States Agency for International Development/Yemen
USDA	United States Department of Agriculture
WB	World Bank
YAR	Yemen Arab Republic
YWA	Yemen Women Association

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## EXECUTIVE SUMMARY

### A. The ISAI Sub-project

#### 1. Objective

The Ibb Secondary Agricultural Institute (ISAI) Sub-project was initiated in 1979 as the first of five sub-projects of USAID's Agricultural Development Support Project (ADSP) under contract to the Consortium for International Development, represented by New Mexico State University. The general goal of the ISAI Sub-project was to improve the welfare of Yemen's rural population by establishing a secondary agricultural training institute. In 1985 the scope was broadened to include three such institutes and the institutional strengthening of the Directorate of Agricultural Education (DAE) in the MOE.

#### 2. Expected Outputs

Nine specific outputs for the ISAI Sub-project included:

- o Staffing each SAI with trained Yemeni teachers, administrators and a farm manager;
- o Devising a common performance-based curriculum, practical applications emphasis and appropriate outreach activities;
- o Development of adequate facilities to deliver the curriculum at each SAI;
- o Preparation of Yemenized textbooks and other teaching materials;
- o Creation of a MOE-coordinated student recruitment, evaluation and placement system functioning at each SAI;
- o Creation of staff recruitment, retention, training and placement programs;
- o Training of MOE personnel to provide leadership, coordination and supervision at the SAIs;
- o Development of strategies and feasibility studies for SAE throughout Yemen; and
- o Carrying out of feasibility and needs assessment of possible post-secondary agricultural institutes (PSAIs).

## B. Evaluation Purpose and Process

The purpose of this Final Evaluation of the ISAI/AED Sub-project, scheduled to conclude in October 1990, was to assess the strengths and weaknesses of the project and to document its major accomplishments, lessons learned, prospects for sustainability and recommendations for further development. The two-person Evaluation Team conducted an extensive review of life of project documentation and held numerous discussions with key personnel of the Project, the Ministries, SAI staff and students, and user agencies. The Team also conducted on-site observations at each SAI and carried out formal surveys of graduates and their employers.

## C. Findings and Conclusions

The specific objectives of this Project have been basically realized. The one major output not achieved is that of the adequate development of the Department of Agricultural Education (DAE) in the MOE, although considerable progress has been made recently. That objective was not pursued until 1988, after the project team moved to Sana'a. Trained Yemeni SAI staffs are in place and utilizing a common competence-based curriculum with 17 Yemenized textbooks (references) and 132 specifically designed instruction modules.

ISAI facilities and related equipment are adequate, following considerable modification and adaptation to evolving needs. Specific project facilities including instructional farms, agricultural mechanics laboratories, food technology facilities and teaching resources centers are in place and functioning except for a food technology facility at Surdud which is still under construction.

Enrollments are currently strong in contrast to fluctuations early in the project. Placement of graduates has developed well. SAI graduates commonly aspire to college level training and several have successfully pursued that goal. Female students are not admitted, because, in contrast to the primary and post-secondary systems, coeducational secondary institutions are not condoned. With the unification of Yemen, a SAI in Aden may need to be integrated into the SAI system.

There is a recognized need for PSAI-level training of graduates to serve the technical needs of the rapidly developing agricultural sector. Increased PSAI capability should take priority over any expansion of the SAI system except for the possible development of a SAI for women.

A serious administrative problem threatens the viability of the Ibb SAI. This problem must be remedied promptly, or the sustainability of that Institute is questionable. Otherwise, the sustainability of the SAIs depends on continues strong commitment and support by the ROY.

## D. Lessons Learned

- o A broader Sub-project scope to encompass the entire SAE system should have been defined at the outset;

- o A longer time was needed to establish a clearly sustainable SAE system;
- o A SAE teacher training program in the FOA should have been a targeted objective;
- o U.S. training of all Yemeni teachers would have resulted in better training at lower cost than did training in Egypt;
- o The roles and responsibilities of SAE teachers should have been emphasized more in recruiting;
- o American-Yemeni co-directors of the ISAI would have provided for more rapid development;
- o The ADSP concept (umbrella) of a system of several Sub-projects was naive and unnecessarily complex;
- o Socio-cultural and traditional constraints are strong, and have precluded female admissions, the great need for training women in agriculture notwithstanding; and
- o The World Bank's standard world-wide secondary school facility design requires extensive adaptation for SAI usage.

#### E. Recommendations

- o USAID should provide modest (perhaps \$200,000/year) continued assistance for at least three years to advance development and institutionalization of the SAE system. Particular emphasis should be placed on strengthening the DAE, as well as general advisory inputs and administrative development;
- o The MOE should act promptly to replace the leadership at ISAI and to assure that in the process of national unification the cognizant Ministry for the DAE be committed to the system and establish linkages to other relevant Ministries;
- o SAI staff should instill a sense of pride and dignity in the engagement of practical, hands-on activity by students. This may require some cultural and attitudinal adjustment by staff;
- o The curriculum should be reviewed and updated continuously to meet changing conditions, needs and technologies;
- o SAI staff development and technical maintenance should be encouraged and provided for through special seminars, resource materials, conduct of annual staff evaluations and provision of tangible forms of recognition;

- o SAI operating budgets already largely supported by the ROY should be increased to provide for currently existing needs and to offset phase-out of AED project inputs. The Team suggests 1991 increases of 25% at Ibb and Surdud and even more at Sana'a for the new SAI program added to the SVS program;
- o Several physical needs should be addressed at SAI facilities. The serious structural failures in the main academic building complex at the Ibb facility are a safety hazard and should be corrected. Increased land area and dormitory capacity are needed at Sana'a. Funded continuing maintenance programs at each SAI are needed and equipment inventory and repair systems should be established at each site. A complete food technology facility should be installed at Ibb;
- o Teaching materials development and updating should be a continuing process. Additional reference texts, new and updated instruction modules, expansion and updating of the teaching resources center and staff performance awards should contribute to these processes;
- o SAI should further development, community and regional outreach, alumni follow-up, contacts and utilization for advisory inputs, and political support;
- o Additional SAIs, with the possible exceptions of the integration of the SAI at Aden and the possible creation of a SAI for women, should not be created unless a clear need for more SAIs is established after present units are more established;
- o Establishment of one or more PSAIs outside Sana'a should be considered. Perhaps the Ibb and Aden SAIs could be converted for highlands and coastal needs, respectively; and
- o The FOA at Sana'a and a FOA at Aden should be strengthened and should be sufficient for Yemen. The establishment of a FOA at Ibb is not appropriate in terms of location or need.

## I. INTRODUCTION

### A. General Comments

This is the final evaluation of the Ibb Secondary Agricultural Institute (ISAI) Sub-project undertaken in the former Yemen Arab Republic (YAR), which officially merged with the People's Democratic Republic of Yemen (PDRY) in May 1990 to form the united Republic of Yemen (ROY). The ISAI Sub-project was initiated in 1979 as the first of five sub-projects under the \$135 million Agricultural Development Support Project (ADSP) by the U.S. Agency for International Development under contract AID/NE-C-1698 with the Consortium for International Development (CID). The ISAI Sub-project was implemented under the institutional leadership of New Mexico State University. The other four sub-projects were implemented by other CID member institutions and included poultry development, horticultural development, university faculty of agriculture development, and a core project with the Ministry of Agriculture and Fisheries (MAF). The horticulture and poultry sub-projects are not currently active.

The first six years of this Sub-project effort focused upon the Ibb Secondary Agricultural Institute development. By mutual agreement of all parties involved, the seventh annual plan of work called for a strategy and feasibility study "to determine the need for secondary and post-secondary agricultural education in all areas of the country". This study was completed and reported in early 1987. Subsequently the ISAI Sub-project activity was broadened to relate to three secondary agricultural institutes at Ibb, Surdud and Sana'a, which had been established and opened in 1979, 1981 and 1982 respectively. The end of the ISAI sub-project is currently September 1990.

### B. Sub-project Objectives

The general goal of the ISAI/AED Sub-project was to improve the welfare of Yemen's rural population via the purpose of establishing within Yemen as secondary agricultural training institution (later broadened to three geographically dispersed institutions) capable of serving governmental and rural sector needs for middle level technical personnel.

More specific Sub-project objectives or "outputs" were:

- o Each SAI fully staffed with trained Yemeni agricultural teachers, administrators and a farm manager (10, 10 and 5 at Ibb, Surdud and Sana'a respectively);
- o To devise performance-based three year curricula, achieve practical applications and conduct appropriate outreach activities without detriment to the secondary certificate standards of the MOE;

- o Educational facilities adequately equipped and refurbished to deliver the curriculum at each SAI;
- o "Yemenized" textbooks and other classroom materials prepared and in use at each SAI;
- o A student recruitment, evaluation and placement system functioning at each SAI and coordinated by the MOE sufficient to achieve enrollment and graduation goals;
- o Staff recruitment, retention, training and placement programs functioning in the MOE to maintain the SAIs indefinitely;
- o MOE management personnel trained in administration of secondary agricultural education (SAE) providing leadership, coordination and supervision of the SAIs;
- o Strategies and feasibility studies for making SAE available in all areas of the country including consideration of establishing additional SAIs on a regional basis or for women; and
- o Feasibility and need assessment of possible mid-level technical agricultural institutes (PSAIs).

#### C. Purpose of This Evaluation

The purpose of this evaluation was to assess the strengths and weaknesses of the ISAI/AED Sub-project scheduled to conclude in September 1990 with a view toward documenting the major achievements of the project and recording lessons learned that may be beneficially applied to the design and implementation of similar projects in Yemen or elsewhere. The Evaluation Team also addressed observations and recommendations of needs and/or opportunities for further development and sustainability of the SAE system.

#### D. Evaluation Team Composition

The two person Evaluation Team, provided by Devres Incorporated under an IQC Delivery Order, was composed of:

Dr. Robert W. Kleis: Executive Dean of International Affairs, University of Nebraska. Dr. Kleis has had 41 years experience in agricultural engineering teaching, research and administration. He has served as agricultural research director, conducted development assistance design implementation and evaluation, industrial consulting, and served as general academic programs administrator. Dr. Kleis was Team Leader for this Final Evaluation.

Dr. Robert G. Meisner: Professor of Education, Kansas State University, specializing in vocational education and particularly agricultural education. Dr. Meisner has had 42 years experience in secondary and post-secondary agricultural education teaching, administration and evaluation, outreach execution, and has participated in long and short term international assignments.

#### E. The Evaluation Process

The Evaluation Team spent seven person-days in Washington participating in background meetings with representatives of the U.S. Agency for International Development, Asia/Near-East Bureau (agriculture evaluation, Yemen desk, procurement and Title XII officers), CID, New Mexico State University and Devres. This period also involved review of numerous relevant project documents available there. The original and subsequent Project Papers were especially useful as reference points. Several other evaluation and special reports provided useful background information about needs, constraints and progress of this sub-project.

Upon arrival in Yemen, several days were spent in visitations with USAID personnel, project leaders, Republic of Yemen ministry officials, ISAI administrators, staff and students, returned training participants and others. This importantly involved SAI site visits for observations of facilities, materials, personnel and operational circumstances as well as some feel for the nature of the agricultural sector being served.

Near the end of the first week in Yemen surveys of SAI graduates and employers were designed and activated with the purpose of obtaining evaluative feed-back about the SAI programs. This involved the services of two Arabic language proficient staff members of USAID/Y.

Further time was devoted to review of additional documents, materials and inputs from the various meetings and interviews.

During the third and last week in Yemen the Team concentrated on analysis of the inputs and background materials accumulated and upon some preliminary formulation of report elements. This period also involved some selected follow-up discussions with resource personnel involved and a preliminary report presentation to USAID/Y and project personnel.

The completion of analyses and preparation of the final draft of this report were done by the Evaluation Team after return to the U.S., August 13. The time period involved in this evaluation effort was July 16 through August 28.

## II. COUNTRY BACKGROUND AND PROJECT SETTING

### A. Historic

Yemen was historically one of the major agricultural production centers of the Middle East with relatively sophisticated irrigation technology dating back through millennia. Shifts in world trade and political patterns during the later Roman period and after caused Yemen to become economically and culturally isolated, with subsistence agriculture becoming the primary type of agricultural activity. In more recent years, isolation combined with weak central government control has made the introduction of a modern agricultural system difficult.

Civil strife of the 1960s and a concurrent prolonged drought also dealt blows to Yemen's agriculture. More recently the agricultural sector was much affected by the migration/remittance process moving labor to more lucrative pursuits abroad and in cities, and a shift of food consumption to more imports made possible by remittance wealth.

### B. Current Role of Agriculture

Agriculture is the major resource base for economic development of Yemen. Its soils are the more fertile of the Arabian Peninsula. Its soils are among the most fertile of the Arabian Peninsula. Cultural traditions related to agriculture are strong. More than three-fourths of the resident population is rural. Their welfare and that of the national economy are very much linked to improvement of agricultural production and related enterprises.

There are three primary agricultural zones. The Tihama, a hot, humid, narrow plain along the Red Sea is a semi-arid area (100 to 300 mm rainfall) with considerable potential for increased production of tropical crops under irrigation. The highlands with mountains, upland plateaus and eroded wadis is more temperate with rainfall of 200 mm (north) to 1200 mm (south). A third area, the eastern desert where most of Yemen's known oil reserves are located, has limited agricultural potential and is used mainly for grazing.

Agriculture is primarily dryland production. Only about 15 percent of the cropland is irrigated. There appears to be limited potential for expansion of irrigation. Indeed, there is a question of sustaining some areas of present irrigation due to lowering ground water levels.

Dryland grains are the major staple food crops with fruit, vegetables and legumes as important supplements. Coffee, once a major export crop, has declined dramatically and the world market situation is bleak. Livestock is used mainly for food and to power farm implements, and is closely linked to the

overall system of subsistence agriculture. Qat, a mild narcotic, is widely grown as a cash crop.

Low productivity and lagging growth, notwithstanding, the agricultural sector is the primary sustainable base for economic development in Yemen. Soil and climatic factors are favorable. The socio-political and economic situation is conducive and national leadership is responsive to agricultural development needs.

### C. Human Resources

A central requirement for sustained development and social and economic growth is the indigenous supply of people appropriately trained for the various elements of the system. This is true for any sector. It is particularly crucial in the agricultural sector with its diverse and dispersed nature. Appropriately educated/trained human resources are essential, from scientific research to production husbandry and many functions in between for both the public and private sectors.

Adequate agricultural education and knowledge of scientific agriculture and agribusiness is lacking at all levels in Yemen. Improving and expanding educational institutions and programs at all levels (preparatory, secondary, post secondary and continuing outreach education) have been considered critical. First priority is upon baccalaureate and secondary levels. This USAID-assisted project focused upon the secondary level programs of the three SAIs.

### III. THE ISAI/AED SUB-PROJECT

#### A. Preceding Activities and Agreements

In the mid-seventies the World Bank contracted to construct the first secondary agricultural institute facilities at Ibb (ISAI) including dormitories, staff housing, classrooms, cafeteria, farm buildings and other facilities needed for an operational campus. They also agreed to provide laboratory and farm equipment. Initially, the Food and Agriculture Organization (FAO) agreed to provide financial and technical assistance to develop and implement the educational program. However, the FAO was unable to fulfill this commitment and USAID agreed to accept this responsibility.

In late 1978 the USAID/Y selected the CID as the Title XII contractor for the broad Agricultural Development Support Project. With the CID design team in early 1979 it was decided that the ISAI would be the first Sub-project of the ADSP and New Mexico State University was identified as the lead university. The ISAI was scheduled to receive its first class in September 1979.

During the July 1979 development of the Sub-project paper several relevant decisions were agreed to:

- o The ISAI Director would be a Yemeni;
- o Expatriate experts from the Middle East would be recruited as technical teachers;
- o Yemeni with BS degrees would be sent to the U.S. for MS-level training to become teachers; and
- o While the first funding period was five years, it was agreed that it would take 10-15 years.

#### B. ISAI Sub-project Purpose and Objectives

A five year contract was signed with the CID in September 1979 for the ADSP under which this Sub-project was activated. At this stage the Sub-project purpose was to establish at Ibb a secondary agricultural institution capable of serving government and rural sector needs for middle level technical people. Specific areas of effort were:

- o Development of a trained Yemeni staff;
- o Completing and equipping school facilities;

- o Development of needed teaching materials;
- o Development of curricula for a 3-year certificate;
- o Establishment of administrative policies and procedures;
- o Provision of assistance in development of an outreach program;
- o Assistance in developing the school farm; and
- o Recruitment of students for ISAI.

Six Middle-East teaching staff members were recruited to fill in while Yemeni staff were being trained abroad. Additionally the Sub-project staff included U.S. staff as Team Leader, English teacher and a farm operations specialist.

### C. Shift in Sub-project Scope

In 1985 the Sub-project focus on the ISAI began to broaden by general agreement to be directed to strengthening all three SAIs including those at Surdud and Sana'a which had been established in 1981 and 1982 and the Directorate of Agricultural Education in the MOE. The five year first phase was extended one year to September 1985 when a revised phase II Sub-project was developed "to improve the efficiency of the secondary agricultural education system of the MOE to supply the Yemeni agricultural sector including both the MAF and the private sector with qualified manpower." The Sub-project name was changed from ISAI to Agricultural Education Development project (AED).

With the expanded scope of the Sub-project and without increased funding levels, several other changes occurred in phase II. These changes included:

- o Yemeni teachers trained in phase I beyond those needed at ISAI were encouraged to accept positions at Surdud and Sana'a;
- o Short term in-service training was provided for teachers at all three SAIs;
- o Most in-service training was conducted in-country for greater attendance and less cost;
- o The Competency Based Curriculum developed at ISAI was accepted at the Surdud and Sana'a institute;
- o Financial support for equipment and operations was provided equally to all three institutes;

- o Additional technical and financial assistance to the Agricultural Education office of the MOE; and
- o The ISAI had to adjust to a lower level of project support.

The five year phase II is ending in September 1990 for an eleven year total life of this Sub-project.

#### IV. HUMAN RESOURCES DEVELOPMENT

The initial Sub-project design called for the NMSU to provide an administration advisor to the ISAI Director and seven Arabic language proficient teachers for the several agricultural subject matter areas. The language requirement necessitated recruitment of third country professionals (TCPs) from neighboring countries. This was done during the first year and continued until the TCPs could be replaced by Yemeni teachers as they completed training programs in the U.S. or Egypt. The TCPs were well qualified and contributed much to the development and implementation of the early stage curriculum offerings.

##### A. Overview: Yemeni Participant Training

During Phase I (1979-85) the Sub-project provided for B.S. and/or M.S. level training of thirty Yemeni participants to become teachers at the ISAI and other SAIs as well as staff of the DAE and of the MOE. By 1985 all were recruited and in degree programs abroad with eleven having completed and returned to positions in the AE system.

Phase II of the Sub-project had trained Yemeni staffing targets of 10, 10 and 5 for ISAI, SSAI and SVS/SAI, respectively. Currently these institutions employ 8, 8 and 3 returned participants and seven others are with the DAE/MOE, the FOA and the MOAF. Nine others are this year completing degree programs in Egypt and one is completing a doctorate program at NMSU (Annex 12).

During each of the first three years, 8-10 Yemeni counterparts were recruited to serve as teaching assistants to the TCPs, to receive in-service training and to study English as preparation for M.S. degree programs in the U.S. This process was only partially successful and because of English deficiencies many were subsequently sent to Egypt for their training.

A mid-project evaluation (1984) described the B.S. participant training (in Egypt) as "progressing very well" and M.S. participant training as "having lagged behind project goals from the outset." Subsequent intensified recruiting and preparation effort has brought the training effort up to target.

In retrospect, it may be concluded that sending participants to the U.S. for intensive English training and then degree programs would have provided better training at less cost than in Egypt. M.S. programs in Egypt have taken four to six years, while in the U.S. they would have taken three or four years including English language training.

##### B. Findings from Former SAI Student Evaluations of Instructors

In this evaluation process, a survey of SAI graduates (Annex 7) included their assessment of their general education and technical agriculture teachers in

terms of several criteria listed in the following table. A three point system of 3 for excellent, 2 for good and 1 for poor was used to code and analyze their pooled responses. (See Table 1).

Graduates surveyed were from all three SAIs and from classes of 1982 to 1989. While they represented some TCP teachers, most survey results represented Yemeni teachers of both general and agricultural courses. In all criteria the technical agriculture teachers were rated higher than those of general secondary classes. This speaks well for the special training that the participants received.

### C. Short Term Training

In addition to the degree level participant training provided to SAI and MOE staff (106 PY) under this Sub-project, Phase II also provided for two types of non-academic training. This included out of country academic management and special technical training for SAI and MOE administrative personnel (60 PM). It also provided 373 PM of special in-country technical training for MOE staff and MAF extension personnel.

Both of these important outputs were realized.

### D. Conclusions

It is clear that the participants trained in this Sub-project, whether in the U.S. or in Egypt, are performing well as teachers in the SAIs. That graduates rate them higher than their general education counterparts may be due to several factors only one of which reflects on the quality of their training under the project. It may also relate to the quality of participants recruited, to technical motivation of teachers and/or students, or to advisory inputs of expatriate project personnel. Whatever the reason it is gratifying to note this generally good performance.

Virtually all the M.S. participants sent to the U.S. were programed to NMSU. It could be considered preferable to have distributed them to various institutions. On the other hand more special attention to their unique needs could be provided to a group and by an institution with special interest and involvement in their ultimate objectives.

Clearly the participants' training and subsequent work has contributed significantly to the three human resource development components; (1) individual development, (2) career development, and (3) organizational development.

Both the NMSU and the DAE/MOE leadership have implemented short term and in-service training programs for SAI and MOE personnel involved in program development, administration, coordination and evaluation. These

**Table 1: SAI Graduates' Assessment of General Education Teachers and Technical Agricultural Teachers**

Rating Criteria	General Education Teachers	Technical Agriculture Teachers
1. Subject Matter Knowledge	2.4	2.6
2. Teaching Know-How	2.3	2.6
3. Previous Preparation	2.0	2.3
4. Actual Experience	2.2	2.5
5. Ability to Communicate and/or Relate to Students	2.4	2.6
Overall	2.26	2.52

activities have reflected obvious benefit to the development and conduct of SAI programs through professional development and involvement of staff.

The SAI staff and, to some extent students, especially at ISAI have organized and conducted numerous workshops, special courses, demonstrations and open houses for MAF extension personnel, women and the local citizenry. These activities were highly commended by MOE and MAF officials as beneficial to their field staff. Such outreach surely has a beneficial local impact, both technically and politically.

The FOA has yet to establish a capability to provide for the in-country preparation of professionals for staffing the AE System. It is strongly recommended that this need and responsibility be addressed by the FOA in collaboration with the MOE and the MAF. It might well also involve the FOE.

Retention of returned participants in the AES and related entities is very good as evidenced by an examination of their current positions. To ensure that this pattern holds true, it is essential that effective leadership be maintained through the cognizant Ministry.

#### **E. Recommendations**

- o The FOA in close collaboration with the MOE and the MAF should develop programs for in-country training of teachers for SAIs and for PSAIs as they are established;
- o The MOE and the MAF should provide continuing opportunities for in-service professional improvement of SAI teachers;
- o The DAE of the MOE should provide continuously strong leadership, coordination, advocacy and support for SAI staff, students, and program development; and
- o The DAE of the MOE must facilitate recognition and rewards for effective teaching and outreach by SAI staff members.

## V. CURRICULUM DEVELOPMENT AND INSTRUCTION

### A. The Development Process

The ISAI started in 1979 using with a generic agricultural education curriculum based upon World Bank guidelines and subsequent UNESCO/MOE collaboration. The process of developing a competence based curriculum and teaching materials tailored to Yemeni needs was initiated early in 1980 with a workshop at NMSU. Participation included the Project Director, Team Leader, Director of the AED, six TCP teachers from the ISAI and resource specialists of NMSU. The product of this workshop was a revised curriculum to be implemented starting in the Fall of 1980 as well as a cadre of persons oriented to continue the curriculum development process.

The curriculum was further refined as it was tested in use before it was formally approved by the MOE following a second specific workshop in Sana'a in April 1982. This workshop involved the AES leadership and the ISAI and SSAI TCP teachers. This curriculum was adopted by all three SAIs (Annex 17). Committees composed of the several teachers of each technical agriculture subject were responsible for specific content, developing instruction materials and common examinations.

Students complete a combined general education and technical agriculture curricula and sit for the standard secondary certification examination after the third year. Performance determines the type of certificate received and the eligibility for admission to a University including the FOA of Sana'a University.

### B. Findings: The Evaluation Process

The survey of SAI graduates included in this final evaluation included their assessments of the general education curriculum and the several major elements of the technical curriculum of their SAI. Their responses of excellent, good or poor (with an option of no response) were digitized as 3, 2 and 1, respectively, and are summarized in Table 2.

Highest ratings were given to Plant Protection (2.7), Extension (2.6) and Horticulture (2.5) with 3.0 being excellent. Only Food Technology (1.9) fell slightly below good (2.0). It is probably significant to note that agricultural subjects rated higher than general education. The subject categories were those of the competency based materials developed for the curriculum (Annex 11), by SAI staff committees.

Graduates surveyed were also asked to assess the several instructional modalities which they experienced as SAI students. The results are summarized in Table 3.

**Table 2: SAI Graduates' Assessments of the General Curriculum and Main Elements of the Technical Curriculum**

Curriculum Component	Mean Rating
General Curriculum	2.1
Agricultural Mechanization	2.4
Animal and Poultry Production	2.4
Bookkeeping	2.3
Crops	2.4
Extension	2.6
Farm Management	2.4
Food and Dairy Technology	1.9
Horticulture	2.5
Plant Protection	2.7
Soils	2.3

**Table 3: SAI Graduates' Assessments of Instructional Modalities**

Type of Instruction	General Education	Technical Agriculture
1. Lecture	2.1	2.5
2. Laboratories	1.8	2.2
3. Practicals	NA	2.3
4. Work Experiences	NA	2.1
5. Student Plots	NA	2.5
6. Examinations	2.3	2.3

As in graduate evaluations of teachers and subject matter areas, they also rated most modalities higher for technical agriculture than for general education. Greater values were ascribed to lectures and student plots than to work experience, practicals and laboratories. This outcome is reinforced by employer observations of inadequate practical "hands-on" training of graduates.

For whatever reason practicals and work experience are not highly valued although the curriculum gives major emphasis to these elements. This may reflect a socio-cultural conditioning of students, teachers or both. It may relate to the non-agricultural home background of many students and teachers. In any case it is an opportunity for program improvement to be addressed.

### **C. Conclusions**

The curriculum development process included appropriately broad involvement of key personnel and led to an appropriate design utilized at all SAIs. It has been developed for relevance to Yemeni conditions and needs. To what extent it is being executed to meet student needs is not quite so clear.

Both graduates and their employers indicate a lack of appreciation and/or abilities of instructors to adequately utilize laboratories, practicals and work experience in the education and skills development process. Greater emphasis needs to be given to applications of agricultural principles and practices in every subject matter area. This may require more in-service training of staff and involve some collaborative input by potential employers. Certainly it requires strong administrative support and recognition of the DAE and SAI Directors.

To ensure that the curriculum, reference texts and competency based instruction modules do not become static, continuous attention must be given to upgrading and updating to incorporate changing technology and fit evolving agricultural conditions and needs. Continuing in-service staff training opportunities must be provided along with incentives for continuous evaluation, development and recognition of program improvements.

### **D. Recommendations**

- o The SAI staff members should give greater attention and emphasis to the practical applications of agricultural principles and related skills development in every subject:
- o A standing national SAI curriculum committee of at least eight members should be established by the DAE from appropriate disciplines and entities to provide continuing attention to changing needs and technologies;

- o **The DAE should establish a standing SAI Advisory Committee of employer representatives to provide counsel, support and cooperation for the AES; and**
- o **The DAE should provide encouragement and recognition of staff participation in program innovation and enhancement.**

## VI. FACILITIES AND EQUIPMENT

### A. Development Process and Inputs

The basic facilities at all three SAIs were of standard design used by the World Bank for secondary agricultural schools worldwide. These facilities, constructed by the MOE (WB financed) included:

- o Administrative offices;
- o Store rooms;
- o Classrooms and laboratories;
- o Farm facilities (shops, horticulture, livestock, food science, and field plots)
- o Dining facilities;
- o Student housing;
- o Staff housing; and
- o Utilities and roads.

By and large these facilities were adequate in scale but left much need for modification to adapt to specific program functions. Some modifications and additions were provided by the MOE and many were assisted by USAID/Y (Annex S).

Some 80% of the necessary furnishings and equipment were to be provided early by the MOE (WB). This has been added to during the project by the YAR with some special equipment by USAID/Y.

The farm lands for practical education were provided by the MOE with subsequent development by that Ministry with numerous specific inputs by USAID/Y.

While the basic WB funded construction was completed on schedule some secondary facilities were not done at all and the equipment list was either not completed or inadequately supervised. The student rooms intended for accommodating four per room are minimally adequate for only two per room.

## **B. Findings: Current Facilities Status**

### **1. ISAI facilities**

The facilities at Ibb are quite complete and adequate for the SAE instructional programs including the laboratory and farm practical training components. The dormitory capacity of 150 (two per room) is a basic match to the capacity of the instruction facilities and to enrollment targets. Enrollment is extended somewhat by local residents staying at home. Equipment for general functions, laboratories, shops and farm is generally adequate and operational.

The ISAI/AED Sub-project has assisted with numerous facility improvements and special equipment items. We were advised on site that specific Sub-project facilities objectives of (1) an operational instructional program, (2) a functional agricultural mechanics facility, (3) a learning resources center and (4) a functional food science laboratory have been realized. We were unable to obtain access to these facilities for observation. Farm land of some 70 acres and improvements are basically adequate.

### **2. SSAI facilities**

Most of the needed facilities at Surdud are in place and functional. The laboratories and farm (75 acres plus improvements) are adequate following some special incremental inputs by the ISAI/AED Sub-project. Dormitory capacity of 96 (two per rooms) is inadequate but expansion of this is in process by the MOE. Local residents supplementation of dormitory limits is not feasible at Surdud. A needed new storage building is near completion.

Specific Sub-project facilities outputs of (1) an operational instructional program, (2) a functional agricultural mechanics facility and (3) a learning resources center have been realized. The fourth specific output of a food technology instruction facility is under construction (perhaps 50% completed) but currently dormant. That this output is not yet complete cannot be attributed to the ISAI/AED Sub-project. It would appear that the new facility will provide for very specialized and comprehensive food technology training.

### **3. SVS facilities**

The academic facilities at Sana'a are basically adequate and functional for both the veterinary and agriculture curricula. Dormitory capacity is minimally adequate given enrollment supplementation by area residents. Farm acreage (5 acres) is quite inadequate in this urbanized setting. A strategy for selling very high value urban land and buying a more extensive acreage further out is being pursued. In the meantime the land is very intensely used and supplemented by access and proximity to MAWR land for some student and outreach use.

With important incremental inputs by ISAI/AED Sub-project a functional one year old agricultural instruction program is in place, a minimally adequate agricultural mechanics facility is established, a learning resources center is operational, and a foods/nutrition laboratory is functional.

#### **4. Maintenance and repair**

Custodial care and maintenance appeared outstanding at SVS, fair at Surdud and very bad at Ibb. The latter may somewhat reflect the rather dormant vacation period. The grounds and farms were well tended at Sana'a and Surdud but were very badly neglected at Ibb.

General maintenance and repair of structures and equipment is always an institutional operational and budgetary challenge. It will be no exception at the SAIs but it is an essential long-term viability prerequisite. The structures and equipment at Sana'a and Surdud sites did not exhibit major maintenance deficiencies but they are yet quite new. Budgetary provision and diligent effort for maintenance and repair must be provided on a continuing basis.

The major instruction facility complex at Ibb has very serious structural damage. This would seem to result from faulty foundations resulting in settling and structural fractures as well as poor quality concrete in the original construction. Remedy will not be simple maintenance but is essential to structural integrity and safety.

Beyond this serious structural problem, there is at Ibb a general lack of routine maintenance such as broken balcony railings, much needed painting, vegetative over-growth, broken furniture, etc. These could be easily remedied without much cost using existing support staff with capable and aggressive administrative leadership.

#### **C. Conclusions**

Facilities are basically adequate for the educational missions of the SAIs. The specific facilities related objectives of the ISAI/AED Sub-project have been achieved with the single exception of the construction of the food technology facility at Surdud. Numerous other nominal facility improvements have been provided by the Sub-project (Annex 5).

#### **D. Recommendations**

- o Prompt attention must be given to the serious structural failures in the main academic building complex at Ibb. This problem represents both a structural deterioration and a safety hazard;
- o Completion of the food technology facility at SSAI should be a priority;

- o **The SVS/SAI should obtain more land for its expanding programs;**
- o **The SVS/SAI should expand its dormitory capacity to accommodate increased enrollments from rural areas;**
- o **Each SAI must establish equipment inventory control and maintenance systems; and**
- o **Each SAI must have a continuing and funded building maintenance program. This need is especially obvious at Ibb.**

## VII. YEMENIZED TEXTBOOKS AND TEACHING MATERIALS

### A. The Process

Phase I of this Sub-project did not specifically call for the development of Yemenized textbooks or teaching materials. The Arabic speaking expatriate teachers of the early years utilized Arabic textbooks from other countries. Because all teachers had at least one degree from the U.S. the instructional materials were gathered worldwide and translated and adapted to Yemen.

As the project evolved, the need for more Yemenized textbooks was recognized. The expatriate staff with help from Yemeni counterparts undertook to develop textbooks for their several respective teaching areas. As Phase II of the Sub-project was defined, a specific objective (output four) to develop Yemenized textbooks was included.

As Yemeni participants returned with U.S. training and the competency based curriculum was developed and adopted, the mode of instruction shifted from use of established textbooks as such to their important usage as references and the development of modular teaching units which are adapted and easily updated to changing Yemeni agricultural conditions. At this stage the Yemeni teachers took over in subject matter subgroups to develop instruction modules and examinations common to the three SAIs.

### B. Findings: Current Status

Seventeen textbooks have been written (Annex 10). Nine have been printed in Egypt and are in reference usage at all three SAIs. The other eight are in review, editing and/or in-use testing stages prior to formal printing.

The quality and relevance of these texts for SAI programs are evidenced by their usage by well-trained teachers, the positive comments of students, and the procurement and extensive usage of these texts by other Arab-language institutions. The MOE justifiably expresses much pride in these publications. The Evaluation Team notes that, in addition to their direct value as reference texts, these publications provide for professional creativity, pride of authorship, stature and credibility for the Yemeni teachers/authors. Most importantly, however, they provide essential and previously non-existent Yemenized reference texts for the instruction programs.

One hundred and thirty-two special subject matter instructional modules have been developed jointly by teachers of given subjects at the three SAIs (Annex 11). They have been reproduced and distributed to students. These are easily updated to changing conditions and especially designed for the competence based curriculum approach to instruction.

### C. Conclusions

Twenty-two SAI graduates interviewed rated agricultural instructional materials on an excellent, good, poor scale as:

Instruction Materials and AVs - Good plus

Textbooks (References) - Good

Library Resources - Good minus

The same graduates rated the same general education resources as poor plus, good and poor plus, respectively. It should be noted that these graduates ranged from 1982 to 1990 so not all of them experienced the more recent materials developed.

The Evaluation Team believes that this Sub-project objective has been very well implemented.

### D. Recommendations

- o Develop still more Yemenized reference texts. Some salary inducement for teacher/authors (perhaps summer period) would be in order;
- o Teachers should revise the instruction modules periodically and update them as needed (likewise audiovisual materials); and
- o Authors should revise and update reference texts to reflect changing conditions and technology.

## VIII. STUDENT RECRUITMENT, EVALUATION AND PLACEMENT

The general ISAI/AED goal was to increase the income and improve the quality of life of rural residents of the YAR through (1) increased agricultural production, (2) improved trade balance and (3) increased consumption by rural families. The more specific subgoal of the ISAI/AED was to provide appropriately trained Yemeni for mid-level technical and management positions in the public and private agricultural sectors.

This goal is consistent with the needs and resource base of the country. It is also consistent with other rural development initiatives such as those of the TDA, CARTC, CHRDP and SURDP which along with the MAF are the most likely employers of SAI graduates. Thus, the SAIs are serving key functions for ROY development.

### A. Recruitment

In the early years of the ISAI, student enrollments fell short of targeted numbers and institutional capacity of 150 plus some local residents not requiring campus housing. Until 1985 it was running at about two-thirds capacity for the three classes. Earlier evaluations attributed this to inadequate recruiting efforts. The civil war and military service demands also pulled students away from the ISAI. Since 1985, more intense recruiting, greater awareness of the SAIs and performance of graduates have caused enrollments, not only ISAI but also SSAI and SVS/SAI, to be at or above capacity. Indeed, greater selectivity of students admitted is now possible and desirable.

### B. Student Evaluation

The dual curricula of general secondary education and technical agriculture places strenuous demands on SAI students. Considering this the students have done well. Their performance is evaluated periodically during each course and by a common examination at the end of each agricultural course. This final examination also becomes a comparative evaluation of instruction effectiveness at the three institutes.

The MOE administered secondary leaving examination is an important evaluation of the general education component of their training. The SAI graduates have scored slightly lower on this than secondary school graduates in general. This is not surprising and should not be considered to reflect less capability of either students or teachers of SAIs. Graduates who score well on the leaving examination are able to successfully apply for University admission. Fifteen graduates from the first three graduating classes of the ISAI were provided scholarships for baccalaureate degree studies in Egypt.

### C. Placement of Graduates

The SAIs have had little role in assisting graduates' contacts with potential employers. A military service requirement immediately following graduation tends to interrupt the career establishment process. But the military system does operate several large agricultural operations. There was no indication that SAI graduates are utilized in these operations but if they were, the military service period could add somewhat to their agricultural experience base. This should be pursued at the inter-ministry level by the DAE/MOE.

After military service, graduates report to the Civil Service Ministry for job placement. Consultations with other Ministries assist in placements to match interests and needs.

Most graduates seek and are placed in public service positions with the MAF and the rural development units. This relates to job security and living conditions at the expense of better salaries and performance rewards in the private sector. It seems that little SAI effort focuses upon opportunities for private sector employment or individual enterprises. The SAI staffing is totally public sector career oriented.

Bylaws governing SAI operations call for follow-up of graduates in the first and fifth years of employment. There was no evidence noted that this process is followed. It should be. It could prove mutually beneficial to both graduates and the SAI programs.

### D. Conclusions

Two-thirds of the SAI graduates surveyed had come from very urban backgrounds. Their interest in attending SAIs seemed related to better campus conditions, a larger scholarship stipend and enhanced prospects for a government job.

Employers' representatives without exception described a need for greater practical skills development. What practical skills might be important will vary by position and employers and not all can be satisfied. But, what can be done better is to instill a sense of pride and dignity in engagement of practical hands-on activity. Employers should be challenged to regard SAI training as a base upon which to further develop specific skills on the job. This could be enhanced by more appropriately designed and supervised summer internships with potential employers or with the SAI operations.

The following recommendations for specific improvements notwithstanding, this Evaluation Team concludes that the SAIs have basically developed very well to effectively serve an important area of training need for ROY development. The ISAI/AED Sub-project has played a most significant role in implementing the development of this SAE system.

**E. Recommendations**

- o SAI staff should instill a sense of pride and dignity in the engagement of practical, hands-on activity by students. This may require some cultural and attitudinal adjustment by staff;**
- o SAI Administration should direct greater emphasis to enrolling students with rural home backgrounds;**
- o The MOE should pursue at the inter-ministry level a policy and procedure for SAI graduates to satisfy their military obligation by serving in the large agricultural enterprises operated by the military;**
- o The SAIs should implement the provision in their Bylaws which calls for a "follow-up" of graduates in their first and fifth years of employment; and**
- o The SAIs should take overt steps to incorporate private enterprise orientation into the educational environment, perhaps including frequent guest lecturers from the private sector.**

## IX. STAFF RECRUITMENT, TRAINING AND RETENTION

### A. Findings

Past recruitment and preparation of individuals necessary to effectively staff the SAIs and the DAE/MOE are described in Chapter IV, Human Resource Development. This early stage staffing was especially critical as they worked to develop the competency based curriculum, develop reference texts and instructional modules, develop facilities, establish operating patterns, develop the practical program components and implement outreach activities; all without detriment to the secondary certificate standards of the MOE.

The performance of returned participants has already been tested and has met the challenge. With the return soon of ten participants yet in training the goal of a trained and Yemenized staff at each SAI will be fully realized. The success of the recruiting is evidenced by the completion rate of the participants and their return to key roles in the SAE system. Retention in the system is very good to date but the time is yet short. Longer term retention will depend upon able administrative leadership and job satisfaction resulting from support and tangible recognition of effective performance.

### B. Conclusions

There will (should) be some attrition due to inadequate performance on the one hand and upward movement of better performers on the other. There is need for developing in-country capability for training replacement staff and for in-service professional enhancement training of continuing staff.

The SAI Directors play key roles in staff selection, orientation, assignments, evaluations and in-service training opportunities. The DAE staff serve a coordinating, planning, and monitoring role as well as participating in annual teacher performance evaluations. It is essential to staff morale, retention and development that these administrative functions be executed competently, fairly and constructively. This seems to be the case at the SSAI and the SVS/SAI.

During the last year at the ISAI a serious problem of staff morale and dissension has developed and already conspicuously threatens program effectiveness and sustainability through staff retention. The MOE must act quickly to curb its rapid deterioration. The situation at Ibb and the need for prompt action is discussed in greater detail in Chapter XI of this Evaluation Report.

### C. Recommendations

- o The MOE should act promptly to change the leadership at the ISAI; and

- o The DAE should establish a rigorous, fair and meaningful teacher performance evaluation system which addresses the full spectrum of program enhancement functions, e.g., teaching, practicum supervision, outreach, materials development, committee duty, counseling, etc.

See also recommendations in Chapter XI of this Evaluation Report.

## X. MOE PERSONNEL TRAINED IN AE ADMINISTRATION

This general output (7) of the ISAI/AED Sub-project called for "MOE management personnel trained in administration of agricultural education; providing leadership, coordinating Yemen's agricultural education efforts, conducting long range planning and supervising the SAIs." More specific measurable objectives were (a) a staffed and functioning SAE administrative unit in the MOE under the Director of AE, (b) a staff performance evaluation system in operation, (c) evidence of delegation of authority and responsibility and (d) a monthly status report of the SAE.

### A. Implementation

This general Sub-project output did not receive major attention until 1988 when the Sub-project Team Leader moved to Sana'a from Ibb. Limited progress had been made in the 1985-88 period with distributed project assistance to the three established SAIs and the establishment of the AE Directorate under Dr. Mohamed Al-Harazi. After the move, the new Team Leader, Dr. Langham, and Dr. Harazi promptly established a close counterpart relationship, working together daily and effectively. With project assistance and MOE support four technical staff were recruited into the DAE; two Egyptians and two Yemeni all trained in AE at the BS level with two at the MS level. This was (and is) considered an adequate sized staff and minimum levels of training. In-service training continues to develop this cadre in the DAE.

The DAE is functioning to regularly monitor teaching at the SAIs to assess effectiveness and conformity to the developed and adopted common curriculum. In-service training workshops are conducted for teachers and administrators (14 technical and teaching methods workshops in 1989-90). Three project sponsored workshops for MOE personnel on curriculum development and related topics were held in 1989.

A SAI teacher performance evaluation is performed each year by a team of three from the DAE. The evaluation is shared with each teacher for the purpose of improvement development as needed. Performance reports are also kept on file. Thus, they matter to the individuals even though they do not directly impact salary or employment status rewards.

These specific DAE staff functions demonstrate appropriate delegation of authority and responsibility by the Director. They also provide regular feedback to the Directorate and the MOE on the status of SAE in Yemen.

### B. Finding

The DAE leadership is competent and committed and has effective relationships upward, laterally and with subordinates. The Directorate staff is

adequate in scale but only minimally qualified for their important functions. Teaching monitoring, teacher evaluation, in-service training and feedback systems are in place. Long range planning resides quite exclusively with the Director.

**C. Conclusions**

This Sub-project output may be said to have been minimally achieved. The status of the DAE and its functions are quite embryonic. They are not yet strongly developed and institutionalized. Too much is, of necessity, dependent upon the very able Director at this point in time.

**D. Recommendations**

- o The DAE staff should be upgraded in training; all should have MS degrees in AE and at least one besides the Director to the Directorate level;
- o All DAE staff should have had SAE teaching experience;
- o Additional DAE staff will be needed if new SAIs are brought into the system (e.g. Aden) and/or post secondary agricultural institutes are developed;
- o It is critical that whatever cognizant MINISTRY emerges from the Unification process be committed to SAE and exercise coordination with other relevant Ministries units; and,
- o Some minimal continued developmental assistance from USAID should be provided to protect the major investment already made and establish sustainability.

## XI. SUSTAINABILITY

### A. General Observations

Sustainability emerges as a challenge for the SAIs individually and as a system. It seems that the continued existence of the institutes is not a question. The training of personnel at the secondary level for service in agriculture has been given high priority. Their performance and the ready acceptance of graduates into mid-level technical positions in the agricultural sector have established them as important and valuable to agricultural development.

That some SAI graduates go on to post-secondary education is also contributing to an important need in agricultural development.

One question of sustainability relates to maintenance of relevance to evolving needs and technology. It is clear that at this stage the SAIs are highly relevant. As agricultural enterprises and related public service programs further develop and modernize, the need for secondary level personnel will clearly increase but it will also change. Education programs such as the SAIs must continuously evolve and adjust to changing technology and conditions in the sector they serve. This process must be overtly exercised by the teachers and administrators involved.

A closely related concern is that of maintaining staff enthusiasm and technical viability. Continuing in-service training initiatives are essential. This plus individual commitment to continuing professional development and effectiveness are critical. Personnel administration policies and incentives must be executed to reward such initiatives toward maintenance of technical viability.

Even as continuing development of staff members and programs are critical to sustained effectiveness, so also is the maintenance and development of the physical resources through which they function. This includes structures, equipment, teaching materials, support services and practicum facilities (farm). This is an area most vulnerable to slippage in a tight budget environment. This area of need will require forward planning and continuous aggressive effort.

Adequate fiscal support, while not sufficient, is certainly essential to sustained effectiveness. This is a major concern at this point in view of program growth, increasing costs and the phase out of the USAID-AED assistance. MOE budget support has developed steadily although not quite adequately.

### B. Findings and Conclusions

Fortunately in the latter years of the AED project assistance, most funding has gone for staff development and non-recurring expenditures (facilities and equipment) rather than recurrent operating costs. This eases the phase-out

impact. The MOE has also provided for some non-recurrent costs as well as the basic operating budget.

To a large degree the SAIs themselves hold the key to their long-run effectiveness in competing for limited government resources. By generating quality graduates and sector demand for them and through outreach programs and mutually valuable interfaces with public and private sector entities, the SAIs demonstrate their value and generating constituency support. Public funding will follow public service and recognized value to the agricultural sector in the political process. SAI administrative and faculty recognition of this and resulting aggressive outreach is most important.

In the political arena, institutional sustainability relates also to appropriate structural affiliation and Ministry level commitment. In the national Unification organization process there seems to be a question yet about which Ministry will be responsible for secondary agricultural education. This could be a crucial issue. This Team does not presume to address it other than to cite the importance of appropriate relationships to other education and/or agricultural systems and of Ministry level commitment to SAE. Adequate support and coordination as well as faculty attitudes and retention could well be at stake and reflect directly upon sustainability of a viable SAI system.

A critical situation has developed at the ISAI during the past year. The new Director is conspicuously inadequate to providing administrative leadership appropriate to this institute. His actions and inactions have caused great dissension and demoralization of teachers and support staff. The project trained teachers are distressed and with two exceptions failed to appear to visit with the Evaluation Team. The campus is a generally depressing environment. The Director could not get people with keys to provide us access to project developed facilities.

Time is critical for high level attention to solving this problem. The rapid deterioration of this premier SAI must be reversed promptly. Otherwise the question of sustainability of this important institution is moot. The problem is just that serious.

There is no such problem at the SSAI or the SVS. Indeed, persons at these institutes noted with much concern the ISAI problem.

Only since 1988 when the ISAI/AED project office moved to Sana'a has significant attention been given to development assistance to the Directorate of Agricultural Education.

This Directorate is an essential entity for leadership, coordination, planning, training and administrative advocacy for the SAIs. Its significant recent accomplishments but also its vulnerability are due to heavy reliance upon one particularly able and dedicated individual, the Director. It does not yet appear to

be functionally developed and institutionalized to a state of sustainability. The long term effectiveness of the three individual SAIs and the SAI system is closely related to further development of a more broadly functioning Directorate of Agricultural Education.

In summary, there is no doubt that the three SAIs will be continued. This Evaluation Team is concerned about sustained quality of the agricultural education components if politically induced stress causes an exodus of well trained and conscientious teachers. The Ibb problem is solvable and similar ones preventable by firm administrative action from the cognizant Ministry.

### **C. Recommendations**

- o The MOE should act promptly to replace the leadership at ISAI to reverse the precipitous deterioration of that premier SAI (also noted in Chapter IX);
- o The ROY through the MOE should provide 1991 budget increases for some 25% for the institutes at Ibb and Surdud (plus covering any previous year encumbrances) and a somewhat greater increase for the SVS/SAI as the general agricultural curriculum moves into years two and three with increased student numbers and teaching loads; and
- o A very modest level of continued technical support should be provided through the ADSP for at least three more years. The leverage and assistance provided to further develop Directorate capabilities would strengthen the AES and enhance its future. It seems that perhaps \$200,000 per year programmed by NMSU with some in kind inputs from that University could greatly enhance the sustainability of this system and continue the developmental progress of the 17 million dollars invested in this 11-year project.

## XII. WOMEN IN AGRICULTURAL EDUCATION

### A. Findings

Emphasis on female education is a quite recent policy of the YAR. Indeed, it is questionable whether, official policy notwithstanding, there is yet real and general emphasis. With the start of public education in 1963, girls were allowed to go to school at all levels. Coeducation is allowed at the primary and university levels but not generally at the secondary level. But long tradition of educating only boys persists, especially in rural areas. This tradition also affects hiring attitudes of employers of graduates. The percentage of women in the workforce is estimated at some 8 percent but the vast majority of these are in agriculture.

Yemeni women play a very important role in agriculture. Male migration has greatly increased women's decision-making and workloads in this sector. This is generally recognized. It is estimated that women provide over 70% of the agricultural labor force. The key role of the agricultural sector in Yemen economic development adds to the case for bringing women into all segments. Important among them is the mid-level technical role addressed by the SAIs.

Two qualified female students enrolled with the first ISAI class. They withdrew because of socio-cultural factors and a directive of the MOE. Those constraints continue at the three operative SAIs. A further constraint is that the present physical facilities cannot appropriately accommodate female students. A very unlikely possibility, given continuing socio-cultural constraints, would be limited admission of female local residents who would not live on campus. It is doubtful that they would experience an appropriate acceptance.

There are many general secondary schools for girls. Given the current general preclusion of coeducational secondary schools, a secondary agricultural institute for girls would seem important to economic development and fair educational opportunities.

### B. Conclusions

Even as there are male teachers in girls secondary schools, it would be appropriate for female teachers to be considered for present SAIs. This role example for girls interested in agriculture could also enhance the effectiveness of outreach programs for female constituents.

The ISAI has organized and conducted extension methods training courses for women extension agents and several technical short courses for home economics agents since 1982. These outreach activities could be expanded and extended from the other SAIs. SAI facilities and staff at Ibb and Sana'a could be used for special training courses during summer vacation periods. Trainees could

be home economics agents, wives of agricultural extension agents and other interested women from the area. Extra compensation would be needed for SAI teachers who are otherwise on vacation between academic years. Dormitory facilities would likely not be needed or desired for local women trainees.

**C. Recommendations**

- o The MOE should consider the establishment of an SAI specifically for women, perhaps in the southern area, as expansion of the SAI system is considered;
- o The SAIs should consider the employment of qualified female teachers as a resource, as role models for girls interested in agriculture, and for enhanced effectiveness of outreach programs for female constituents; and
- o The ISAI should continue specific outreach offerings for female constituents and similar outreach programs should be developed at the SSAI and the SVS/SAI.

### **XIII. OTHER ISSUES ADDRESSED**

#### **A. Outreach and Collaboration**

One of the mechanisms for "hands on" experience of SAI students has been the planning and implementation of a variety of outreach activities. In addition to providing student experience and benefits to community groups this generates good will and recognition for the SAI.

Outreach activities, primarily at Ibb, have included numerous special training programs for other projects and groups e.g. annual demonstration and field days for farmers, extension workers, and other interested persons of the region; and diagnostic and consulting services to other technicians and producers of the area. The other two institutes have not developed as much outreach. They are newer but they also have different settings. Surdud is quite isolated and SVS is urban.

For public relations, educational and public service reasons, all institutes should expand their outreach activities designed for the regional needs and circumstances. This outreach effort should extend to units and projects of all Ministries related to agriculture, broadly defined; e.g. fisheries, forestry, water resources, rural development, agribusiness, planning, irrigation, nutrition and other education systems, as existent and relevant to the region.

The national unification process currently renders uncertain the exact content and composition of the 33 Ministries. But, this need not constrain collaboration for mutual benefit in regional sub-entities.

#### **B. Alumni Contact and Organization**

The SAIs have done very little by way of "tracking" and maintaining contact with alumni. Efforts in this area could provide continuing development benefits to graduates as well as loyalty development, political support, recruiting help, advisory input, outreach linkages and institutional based social and professional camaraderie. Institutes are urged to develop an alumni tracking system, periodic communications, and mutually beneficial contacts and involvement.

The Directorate of Agricultural Education has a function of tracking SAI graduates. This is important to their leadership and administration of the SAE system. But this cannot serve the same mutual benefits potential as individual SAI alumni linkage activities.

#### **C. ISAI/AED Sub-project Management**

Both members of this Evaluation Team have been sufficiently involved in USAID assisted institutional development projects to recognize and appreciate effective project management and implementation. This Sub-project exhibits this

and its success and relationships provide verification. The expatriate contractor staff are capable and committed. Likewise the NMSU-based backstopping seems to have been genuinely committed to effective achievement of project objectives. That project staff have moved both ways between Las Cruces and Sana'a indicates effective relationships and commitment.

Highly important is the close and harmonious working relationship of the Team Leader and counterpart Mr. Al-Harazi. Regularly scheduled daily meetings have maintained communication and confidence as well as timely actions. Interfaces with other Yemeni offices and the SAI Directors seem effective. Likewise relationships with other agricultural development assistance projects are appropriate.

Early stage project documents indicate that it took much of the first five year phase of the project before effective operational relationships and procedures evolved. Interaction with and understanding by USAID/Y seems less than might be desirable. This may relate to extensive staff turnover in USAID/Y and a resulting lack of project memory and familiarity.

There have undoubtedly been problems that seemed more than minor at the time but at the point of this evaluation the management by NMSU personnel seems to be very good.

#### D. Study of Secondary Agricultural Schools in Yemen

Output eight of the 1985 Sub-project paper called for "strategy and feasibility studies of making secondary agricultural education available to all areas of the country including consideration of establishing additional SAIs regionally or for women." Such a study was implemented by the CID in early 1987 with a team composed of Mohamed Al-Harazi (MOE), Ali Kassim (MOE), Harold Bergsma (NMSU) and William Shaner (CSU-Team Leader).

The inputs to this quite comprehensive study and report of April 1987 relied heavily upon survey interviews with:

- o 17 graduates of all three SAI in different employment situation, only one of which was private sector (of 265 graduates);
- o 20 current or potential private sector employers of SAI graduates;
- o 40 public sector officials in several MAF Directorates and sub-authorities, major rural development projects and SAI Directors and Teachers; and,
- o 135 first year SAI students.

A number of conclusions are drawn from this study which continue to be relevant to the functions of the SAI system. Graduates generally are not enthused about working as Extension Agents given the low level of education of other agents and relatively poor farmer image of that service. Graduates who were agents previously were an exception. Many of the graduates aspire to obtain a college degree; perhaps related to higher salary scales. Graduates turn down opportunities to earn more by working in hardship areas or in the private sector.

Major employers were the MAF units, the TDA and the rural development projects. No private firms contacted had hired SAI graduates although several expressed interest in doing so. Graduates were concerned about less employment security in the private sector.

That team concluded that the supply-demand relationship was about in balance at some 125 graduates per year. This conclusion did not take into account the SAI graduates that might be successful in their B.S. degree aspirations.

This study concluded "---that the MOE ought not to invest in a new SAI at this time, but instead should tighten up the existing SAI programs. In contrast, a Post Secondary Agricultural Institute (PSAI) seems to be needed so that the MoE should begin thinking about the PSAI's course content, location and other characteristics." That study team also "---decided against a recommendation to have secondary females attend one of the SAIs or to build a SAI solely for women."

Whether or not this study report and its conclusions and recommendations has been utilized as such, we cannot ascertain. But, it does appear that subsequent courses of action have been consistent with the principle conclusions cited.

The Evaluation Team notes that the unification of Yemen may well have a bearing upon this issue.

#### E. Feasibility and Need Assessment of Possible Post-Secondary Agricultural Institutes

The ninth and final output item of the 1985 Sub-project paper called for a "feasibility and need assessment of possible mid-level technical agricultural institute completed." The ISAI/AED Sub-project commissioned such a study which was conducted by Dr. Gary C. McVey for NMSU and Dr. Mohamed Al-Harazi of the MOE.

Their November 1988 report, "Post-Secondary Agricultural Institute Study" focused on the need for a Post-Secondary Agricultural Institute including the manpower requirements of the agricultural sector for PSAI graduates; the

opportunities for challenging and rewarding careers for PSAI graduates; the region or regions where an initial PSAI would have the greatest impact on increasing income to farmers; development of internships and customized training programs; agricultural education opportunities for women; and in-service education for MAF personnel and secondary teachers.

The methodology of this study involved individual meetings with the MOE, MAF, FOA, USAID, SAI faculty and students, World Bank, private sector representatives and others. These meetings were followed by a group meeting during which models of PSAIs were presented and discussed, which in turn led to study team analyses of inputs and formulation of recommendations.

Their recommendations in brief were for the development of the first PSAI in the uplands but not at Sana'a to accommodate a first year enrollment of 75 with 60 anticipated to complete. The recommendations further include a mission statement, staffing pattern, administrative structure, physical plant requirements, a women's program component, outreach and cooperation with industry. They also suggest that a second PSAI serving the low-lands region may be needed.

This ISAI/AED Final Evaluation Team has not been able to discern any affirmative utilization of this report to date in the overall development of agricultural education. We suggest that it may have new usefulness in the broadened geographic context resulting from the unification of Yemen. Its basic premises of need are still valid.

It was reported that when visiting the ISAI in 1989 the President suggested developing it into a Faculty of Agriculture. He obviously saw that Institute in a much different condition than now exists. This Team strongly suggests that attention should be directed to strengthening the fledgling FOAs at SU in the highlands and Aden on the coast. The Team does not believe that a third FOA is not needed to serve needs for Baccalaureate level agricultural education for the ROY.

There is a need for PSAI graduates. As agricultural development progresses this need is increasing, and the adequacy of SAI training to meet technician level needs will be limited. A two-year PSAI program with an entrance requirement of a secondary certificate and a rural background could provide a higher level of agricultural education including a practical emphasis and perhaps some specialization (e.g., crops, livestock, food technology, or mechanization) during year two. Students could be those of the upper standing of those not admitted to Faculties of Agriculture. Thus, a PSAI program would be considered as "terminal" and would have post-secondary training status of its own. This would be a more logical conversion of the Ibb Institute than to a FOA.

This Evaluation Team suggests that there should be no co-location of any combination of FOA, SAI or PSAI.

#### XIV. LESSONS LEARNED

- o The Sub-project should have encompassed the total SAE system at the outset. The development of a single geographically specific institution was undertaken prior to considering the total national policy and organizational development within which it would function. It was recognized quite early in the project that the national system of SAE should be addressed. A second and third SAI were established in 1981 and 1982, respectively. The development of a national Directorate was incorporated subsequently during Phase II. Initial project focus on a SAE system such as in Morocco or Tanzania would have been more efficient in organizational and human resource development.
- o A longer time frame was needed to establish a complete and clearly sustainable SAE system. Given the manner in which the Sub-project focus evolved, there was not enough time to build the capabilities of the DAE to a state of clear functionality and sustainability;
- o A SAE teacher training program in the FOA should have been a targeted output of the ISAI/AED Sub-project or jointly with the FOA Sub-project of the ADSP. Without this element of the AES, the SAIs and the DAE are yet reliant upon out of country training of agricultural teachers and institute administrators;
- o U.S. training of all Yemeni teachers would have been higher quality and lesser cost than in Egypt. Many trainees took four to six years to complete programs in Egypt without acquiring English capability. One year of intensive English in the U.S. followed by a two year Masters Degree would have been more efficient;
- o The role and responsibilities of a Secondary Agricultural Teacher should have been emphasized more in the recruiting, preparation and training of SAI teachers. Returnees believed that they should be paid extra for performing duties which are integral to teaching duty; e.g. preparation of instructional materials and conducting practicals;
- o American-Yemeni Co-Directors of the ISAI would have provided a more controlled and rapid development process in the early years and would have provided valuable counterpart training for the designated Yemeni Director;
- o The ADSP concept that Team Leaders of the several Sub-projects would perceive themselves as members of a CID team program was naive. Leaders from different subcontracting institutions and with differing specific project objectives don't function that way in well developed and institutionalized settings. To function that way in a

challenging developing arena would have required a very special set of administrators which did not exist during much of this project period;

- o Socio-Cultural and traditional constraints are strong, slow to change and demanding of respect in institutional development. The large and increasing role of women in management and labor in agricultural enterprises notwithstanding, their access to coeducational training at the SAIs is not acceptable at this stage. This may be said to be unfortunate in terms of limiting utilization of a major segment of the human resource pool;
- o Standard secondary school facility design does not fulfill specific functional needs of an SAI without extensive adaptation and supplementation. The basic structural space is, however, adequate and cost efficient; and,
- o Many SAI graduates have aspirations other than the mid-level technical positions for which they are trained. They tend to value job security at a cost of better salaries and more advancement potential. Many aggressively seek to pursue College degrees in-country or abroad. Given adequate credentials and ability, this aspiration should not be regarded as diminishing the impact of SAI programs. Higher educated people are also needed to serve agricultural development.

ANNEX 1

Scope of Work: Evaluation of the  
Secondary Agricultural Institute Project

Scope of Work: Evaluation of theSecondary Agricultural Institute Project

PIO/T No. 279-052-3-90111

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DELIVERY ORDER STATEMENT OF WORKBACKGROUND

USAID/Yemen requests a final evaluation of the Ibb Secondary Agricultural Institute (ISAI) subproject of the Agricultural Development Support Project (ADSP).

ARTICLE I - TITLE

Evaluation of the Secondary Agricultural Institute (ISAI) subproject of the Agricultural Development Support Project (ADSP), Project Number 279-0052.

ARTICLE II - OBJECTIVE

The contractor shall provide a two-person team with sole responsibility for the subject evaluation, with a view toward documenting the major achievements of the project and drawing up "lessons learned" that can be applied in the design and implementation of similar projects in Yemen or elsewhere.

ARTICLE III - STATEMENT OF WORK

The Contractor shall conduct an evaluation which addresses the following areas of activity under the ISAI sub-project:

1. Human Resources Development: Assess the effectiveness of the long and short term training efforts funded under ISAI. What were the strong points and weak points of long term training program? Of the short term training program? How effective were these training programs in meeting the long-term requirements of Yemen's network of secondary agricultural institutes? To what extent did the results of participant training in the US and Egypt differ? If there was a difference, which training site was more effective and why?

2. Textbook and Curriculum Development: Analyze the effectiveness of the textbook and curriculum development initiatives supported under ISAI. To what extent is the curriculum now in place responsive to Yemen's long-term agricultural needs? To what extent do textbooks provided meet the needs of the students trained in secondary agricultural institutes in Yemen? How effective has ISAI been in developing and implementing a hands-on, outcome-based curriculum for secondary agricultural institutes in Yemen?

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3. Facility Development: Examine the support for facility development provided under ISAI. Given the Yemen context, to what extent do the facilities and equipment in place in Ibb, Surdud and Sanaa meet the needs of the institutions concerned? What has been USAID's contribution in developing these facilities? To what extent have the physical requirements of the institutions concerned been met?

4. Institution Building and Sustainability: Assess the extent to which institution building efforts under ISAI during the 1979-1990 period at Ibb, Surdud and Sanaa have been effective in meeting project objectives. Will the activities begun with USAID support under ISAI be sustainable once USAID funding ends? To what extent are the recurring costs of the institutions concerned being met? To what extent will staff training, physical maintenance and other essential inputs be maintained once USAID involvement ends? To what extent has a sustainable support mode been built up in the Ministry of Education in the final years of the project aimed at supporting secondary agricultural education in Yemen?

5. Other Issues: To what extent, if any, have Women in Development (WID) concerns be addressed under the ISAI project? To what extent is the Ibb school, along with sister institutions at Surdud and Sana'a, meeting their own institutional goals in terms of attracting students and training them to enhance agricultural development in Yemen? To what extent are graduates of the institutions being tracked by the institutions themselves? In what capacity and at what level are most graduates working? To what extent are the institutions developing outreach and extension programs in the communities in which they are based? To what extent have effective relationships been established with other agricultural organizations in Yemen in education, research, extension and other fields, with a view toward effecting coordinated, enhanced agricultural development in Yemen?

6. Lessons Learned: Based on the findings described above, provide a consolidated list of lessons learned through the ISAI experience that can be applied when designing and implementing similar projects in Yemen or elsewhere.

#### ARTICLE IV - REPORTING REQUIREMENTS

The evaluation team shall have sole responsibility for completing a final evaluation report which at a minimum shall include the following:

A. Executive Summary of not more than five pages summarizing the main findings, conclusions, and lessons learned. The Executive Summary shall also state the development objectives of the project, purpose of evaluation, and methods and procedures used.

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B. Completed A.I.D. Project Evaluation Summary form, based on a sample provided by the Mission Evaluation Officer.

C. Table of Contents

D. Main Body of Report, not to exceed sixty double-spaced pages of text. This main section of the report shall be organized by section on the basis of the SOW. The main body of the report shall also provide a brief discussion of the economic, political and social context in which the project took place; team composition and study methods; and specific lessons learned from the ISAI experience that would aid in the effective implementation of similar projects in Yemen or elsewhere in the world.

E. Annexes, to include at a minimum a complete copy of the evaluation SOW; a map of Yemen with the sites of the relevant secondary agricultural institutions shown; a complete bibliography of documents consulted in the course of the evaluation; a list of individuals consulted in the course of the evaluation, along with institutional affiliation; a consolidated list of major USAID financial contributions and inputs and outputs associated with the project; a consolidated statement of the USAID contribution in terms of commodities, equipment, and construction; and a consolidated list of long-term Yemeni participants trained under the project, indicating type, length and location of training program and current position held. Additional annexes (and photographs or illustrations) that report and amplify on the evaluation findings may also be provided as appropriate.

Team members shall coordinate arrival and departure times to ensure that the team remains intact throughout the course of the evaluation. Formal meetings shall include at a minimum an initial orientation and team planning meeting (TPM) in Sana'a within the first two days after arrival, at which time results of conversations in Washington and at NMSU shall also be discussed; a status report to Mission staff halfway through their time in Yemen; and a final close-out presentation no fewer than two days prior to departure from Yemen. Additional meetings with USAID staff, government officials or other individuals may be called as appropriate.

The evaluation team shall leave with the Mission a near-final draft of the report. Any additional Mission comments shall be telexed or faxed to the contractor within four weeks after the team departs post. An entire package of not less than thirty copies of the final report shall be pouched to the Mission by the Contractor not less than four weeks after these comments arrive. An additional four copies of the final report shall be sent to the Mission by courier immediately upon completion.

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ARTICLE V - RELATIONSHIPS AND RESPONSIBILITIES

The team will work under the guidance and supervision of Abdel Moustafa, Acting Chief, Office of Agriculture, USAID/Yemen. Additional guidance may be provided from time to time by the Mission Director and by the Mission Evaluation Officer.

ARTICLE VI - PERFORMANCE PERIOD

The evaluation shall begin in Washington on or about July 16, with arrival in Yemen scheduled for on or about July 23; the Yemen part of the evaluation will be concluded by on or about August 13. An additional six week period may be required to receive and process comments from the Mission, the entire evaluation being formally concluded no later than September 30, 1990.

ARTICLE VII - WORK DAYS ORDERED

Evaluation Research Specialist	26 days
Management Analysis, Institutional Analysis and Operations Research Specialist	22 days

ARTICLE IX - SPECIAL PROVISIONS

A. DUTY POST

Duty Post is Sanaa, Yemen Arab Republic. Brief field trips requiring travel by road and/or air will also be required to Ibb and Surdud, Yemen Arab Republic.

Two days of briefings in Washington DC for both team members at the beginning of the evaluation are also required.

B. LANGUAGE REQUIREMENTS

None

FAX MESSAGE

TO: M/SER/OP

THROUGH: Dorothy Young, ANE/TR/AGR

FROM: Abdel Moustafa, Acting Chief, Office of Agriculture  
Jonathan Addleton, Evaluation Officer  
USAID/Yemen

SUBJECT: Request for Amendment in Deliver Work Order 9,  
IQC PDC-0085-I-00-9089-00

DATE: July 30, 1990

BACKGROUND

Delivery Order 9 under IQC PDC-0085-I-00-90890-00 was signed by the AID/W Contracting Officer on July 13, 1990. Under the terms of the Delivery Order, a team of two specialists fielded by Devres was to undertake the final external evaluation of the Ibb Secondary Agricultural Institute (Project No. 279-0052). Based on this Work Order, the two-person Devres team (Kleis and Meisner) arrived in Yemen on July 23.

The evaluation was originally conceived as a "memory document" aimed at analyzing and assessing project implementation, "with a view toward documenting the major achievements of the projects and drawing up lessons learned that can be applied in the design and implementation of similar projects in Yemen or elsewhere."

Subsequent changes in Mission Management and in Yemen itself have resulted in a strong desire to expand the scope of work to include the results of survey-based data collection and address in greater depth project issues and concerns which potentially have a significant impact on agriculture and education in Yemen. This added depth, while ensuring a more comprehensive project evaluation, will also be useful as USAID and the new Republic of Yemen (ROY) officials review development plans and implement programs in the 1990s.

Discussions with the two evaluation team members indicated that they were able and willing to accommodate these changes, subject to Devres concurrence and the execution of an Amendment to the IQC Work Order which would reflect adjustments in the original SOW and would ensure adequate funding for the additional level of effort required. Under no circumstances will the time required for completing the original Work Order and this Amendment exceed 120 days.

Changes requested in connection with this Amendment are outlined below. A revised PIO/T facesheet is also attached along with an illustrative budget reflecting additional costs likely to be incurred, ensuring sufficient funding to cover the additional activities. Although the SOW has been revised, areas covered largely reflect those outlined in the original SOW. The most notable difference is the addition of two surveys aimed at increasing data availability and improving the credibility and usefulness of the final report.

Please note that the Amendment does not require any additional workdays in Yemen itself. It does, however, shift some of the report writing to the United States, allowing greater time for surveys, data collection and analysis in Yemen. In this regard, the Amendment provides funding for up to eighteen additional work days in the U.S. for the evaluation team. The proposed timing for completion of the activity is also extended to accomodate this change.

#### PROPOSED AMENDMENT

1. The Amendment substitutes a new Article III ("Statement of Work"), which should read as follows:

The contractor shall conduct an evaluation which addresses the following areas of activity under the ISAI sub-project of ADSP:

A. Human Resource Development, including the staff at all three Secondary Agricultural Institutes: Assess the teacher and administrator training efforts funded under ISAI, including information on targets and actual numbers. Assess the quality of training in both Egypt and the US, the relevance of both long and short term training, retention rates within the SAI system, the involvement of women, and overall job performance. Inputs for this section shall be based in part on surveys of SAI graduates (at least 30) and employers (at least five), conducted with the assistance of two Arabic-speaking USAID/Yemen staff.

B. Curriculum Development: Assess progress in establishing a competency-based, relevant curriculum and practical outreach activities at each SAI, including information on status, effectiveness, relevance, evaluation, learning processes, and teacher participation. Based on this analysis, comment on the effectiveness of the learning system in place and on the extent to which students are learning what they need to know. Inputs here will also be based in part on the survey indicated in Section A above.

C. Facilities Development: Assess the adequacy of equipment and facilities in place, including the operational instructor program, agricultural program, learning resources center and food science laboratories at each SAI. Also, analyze the operational effectiveness of individual SAIs, including the extent to which maintenance, repair, and budgetary requirements are being met and sustained.

D. Textbooks and Teaching Materials: Assess the extent to which goals relating to the Yemenizing of textbooks and teaching materials for each subject at each SAI have been accomplished. In this regard, analysis should cover targets and actual quantities, quality issues, relevance to Yemen, affordability and availability to students.

E. Student Recruitment, Evaluation and Placement: Assess the student recruitment, evaluation and placement process at each SAI as coordinated by the MOE, including achievement of annual graduation goals. Assess the extent to which graduates are being placed at appropriate institutions, and the extent to which training is preparing them for the jobs to which they are assigned. Inputs here will also be based in part on the survey indicated in Section A above.

F. Staff Recruitment, Training and Retention: Analyze the existence and implementation of staffing plans/programs at each SAI, including data on numbers recruited and retained, quality indices, and planning processes.

G. MOE Personnel Trained in Administration of Ag. Education: Assess capacity of Ministry of Education (MOE) personnel to provide effective leadership, coordination and long-range planning related to Agricultural Education. Areas covered here include the effectiveness of the administrative unit in MOE under the Director of Agricultural Education, operative staff evaluation systems, delegations of authority and responsibility, and reporting systems.

H. Sustainability: Assess the extent to which institution building efforts under ISAI have been effective in meeting project objectives. In this regard, information about the policy framework, budgetary requirements and commitments, staff requirements, and other information needed to form conclusions about sustainability shall be individually examined and analyzed, with a view toward discussing the extent to which activities begun with USAID support under ISAI are likely to be continued once the project ends.

I. Women in Agricultural Education: Assess the extent to which women participate in secondary agricultural education in Yemen, including efforts undertaken by ISAI to increase female involvement. Analyze constraints to furthering female participation in agricultural education and Yemen and provide recommendations on how this participation can be enhanced and improved.

J. Lessons Learned: Based on the findings described above, provide a consolidated list of lessons learned through the ISAI experience that can be applied when designing and implementing similar projects in Yemen or elsewhere.

2. The Amendment replaces paragraphs two and three in Article IV "Reporting Requirements") with the following:

Team members shall coordinate schedules to ensure that the team remains intact throughout the course of the evaluation. Formal meetings shall include at a minimum an initial orientation and team planning meeting (TPM) in Sana'a within the first four days after arrival; at least one formal "mid term" progress report; and a formal preliminary presentation and status report to Mission staff no fewer than two days prior to departure from Yemen. Additional meetings with USAID staff, government officials, or other individuals may be called as appropriate.

The evaluation team shall leave with the Mission a draft of developed portions of the report prior to their departure on August 12, with any preliminary Mission comments on this early draft due in Washington by fax not more than two weeks after the contractor departs post. A "near final" draft copy of the report, reflecting Mission comments, analysis of the two surveys, and analysis of other material collected by the team while in Yemen, shall be sent to the Mission by courier or fax by September 15, 1990.

Once the draft arrives, the Mission shall have another two weeks to make any final comments on the "near final" draft report by fax or telex, after which the report will be put into final by the team in Washington. The entire package of not less than thirty copies of the final report shall be pouched to the Mission by the Contractor not more than two weeks after these final comments are received in Washington. An additional four copies of the final report shall be sent to the Mission by courier immediately upon completion of the final report.

3. The Amendment replaces the paragraph in Article VI ("Performance Period") with the following:

The evaluation team shall arrive in Yemen on or about July 23 and the Yemen portion of the evaluation shall be concluded on or about August 12, 1990. Up to an additional eighteen working days (eight working days for each team member, plus an additional two days for the team leader to finalize the report)) shall be required in Washington to complete the analysis and finalize the report. Under no circumstances will the time required to complete this Amendment go beyond October 30, 1990.

clear: RSchmeding, EHR (draft)  
LKata, ACO (subs)

1280P

ANNEX 2

Project Evaluation Summary (PES)

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# A.I.D. EVALUATION SUMMARY PART I ANNEX 2

(BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS)

IDENTIFICATION DATA

<b>A. REPORTING A.I.D. UNIT:</b> <u>Yemen</u> (Mission or AID/W Office)  (ES# _____ )	<b>B. WAS EVALUATION SCHEDULED IN CURRENT FY ANNUAL EVALUATION PLAN?</b> yes <input checked="" type="checkbox"/> skipped <input type="checkbox"/> ad hoc <input type="checkbox"/> Eval. Plan Submission Date: FY ___ Q ___	<b>C. EVALUATION TIMING</b> Interim <input type="checkbox"/> final <input checked="" type="checkbox"/> ex post <input type="checkbox"/> other <input type="checkbox"/>			
<b>D. ACTIVITY OR ACTIVITIES EVALUATED</b> (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report)					
Project #	Project/Program Title (or title & date of evaluation report)	First PROAG or equivalent (FY)	Most recent PACD (\$mo/yr)	Planned LOP Cost (\$000)	Amount Obligated to Date (\$000)
	Agricultural Education Development (Subproject of ADSP)				

<b>E. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR</b>  Action(s) Required	Name of officer responsible for Action	Date Action to be Completed
(Attach extra sheet if necessary)		

APPROVALS

<b>F. DATE OF MISSION OR AID/W OFFICE REVIEW OF EVALUATION:</b> mo ___ day ___ yr ___			
<b>G. APPROVALS OF EVALUATION SUMMARY AND ACTION DECISIONS:</b>			
Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
Signature Typed Name	Signature Typed Name	Signature Typed Name	Signature Typed Name
Date: _____	Date: _____	Date: _____	Date: _____

**H. EVALUATION ABSTRACT (do not exceed the space provided)**

This final evaluation of the ISAI/AED subproject of the ADSP was executed by a two person team from Devres, Inc. July 16 - August 28, 1990. This subproject (1979-1990) has assisted the YAR (now ROY) to develop a first secondary agricultural institute at Ibb (ISAI) under a contract with the Consortium for International Development (CID) and with New Mexico State University and the YAR Ministry of Education. The project was broadened in phase II (1985-1990) to assist three SAIs (Ibb, Surdud and Sana'a) and the Directorate of Agricultural Education (DAE) of the MOE.

The purpose of this evaluation is to assess the accomplishments of the project, identify problems and needs, document lessons learned and provide recommendations for future development. The procedure involved extensive review of documentation, meetings with key personnel, extensive interviewing of people involved, site visitations and surveys of SAI graduates and employers.

**Major findings and conclusions:**

- The specific project objectives have been essentially met.
- The project management by NMSU is very good.
- The DAE needs further strengthening.
- The SAI staffs are trained and implementing the competency based curriculum as developed.
- Reference texts (17), instructional modules (132) and teaching resources centers (3) have been developed.
- Facilities with but a few deficiencies are adequate.
- Enrollments are high and graduates are employed.
- A very serious administration problem exists at Ibb.

**Major recommendations:**

- A moderate level of continuing assistance - 3 years.
- Prompt remedy of administrative problem at Ibb.
- Continuing review and updating of curriculum.
- Continuing staff development and technical maintenance.
- Facilities maintenance process and funding.
- Additional and updating of teaching materials.
- Increased outreach and alumni tracking programs.
- Further strengthen present SAIs before expanding.
- Address need for post-secondary training (PSAIs).

ABSTRACT

**I. EVALUATION COSTS**

1. Evaluation Team				
Name	Affiliation	Contract Number <u>OR</u> TDY Person Days	Contract Cost <u>OR</u> TDY Cost (US\$)	Source of Funds

2. Mission/Office Professional Staff Person-Days (estimate) \_\_\_\_\_

3. Borrower/Grantee Professional Staff Person-Days (estimate) \_\_\_\_\_

CUS/3

# A.I.D. EVALUATION SUMMARY PART II

## J. SUMMARY OF EVALUATION FINDINGS, CONCLUSIONS AND RECOMMENDATIONS (Try not to exceed the 3 pages provided) Address the following items:

- Purpose of activity(ies) evaluated
- Purpose of evaluation and Methodology used
- Findings and conclusions (relate to questions)
- Principal recommendations
- Lessons learned

Mission or Office: \_\_\_\_\_

Date this summary prepared: \_\_\_\_\_

Title and Date of Full Evaluation Report: \_\_\_\_\_

### A. Project Objectives

This agricultural education project (ISAI/AEP) started in 1979 as the first of five subprojects of the ADSP by the USAID under contract with the Consortium for International Development with leadership of New Mexico State University. The general goal was to improve the welfare of Yemen's rural population via the purpose of establishing a secondary agricultural training institute. In 1985 the scope was broadened to three such institutes and strengthening the Directorate of Agricultural Education in the MOE.

Nine specific subproject objectives (outputs) included: (1) each SAI staffed with trained Yemeni teachers, administrators and a farm manager, (2) devise a common performance based curriculum, practical applications emphasis and appropriate outreach activities, (3) develop adequate facilities to deliver the curriculum at each SAI, (4) Yemenized textbooks and other teaching materials (5) MOE coordinated student recruitment, evaluation and placement system functioning at each SAI, (6) staff recruitment, retention, training and placement programs, (7) MOE personnel trained to provide leadership, coordination and supervision of SAIs, (8) strategies and feasibility studies for SAE throughout Yemen, and (9) feasibility and needs assessment of possible post-secondary agricultural institutes (PSAIs).

### B. Evaluation Purpose and Process

The purpose of this final evaluation of the ISAI/AED subproject, scheduled to conclude in September 1990, is to assess the strengths and weaknesses of the project and to document its major accomplishments, lessons learned, sustainability and recommendations for further development. The two person evaluation team functioned through (1) extensive review of life of project documentation, (2) numerous discussions with key personnel of the project, the Ministries, SAI staff and students, and user agencies, (3) on site observations at each SAI and (4) formal surveys of graduates and their employers.

### C. General Findings and Conclusions

The specific objectives of this project have been basically realized with the exception of the adequate development of the DAE in the MOE (output #7). That objective was not pursued until 1988 after the project team moved to Sana'a and considerable recent progress is yet short of a desirable stage. The trained Yemeni SAI staffs are in place and utilizing a common competence based curriculum with 17 Yemenized textbooks (references) and 132 specifically designed instruction modules.

The facilities and related equipment are adequate after considerable modification and adaptation to evolving needs. Specific project facilities development of instructional farms, agricultural mechanics laboratories, food technology facilities and teaching resources centers are in place and functioning except a food technology facility at Surdud which is yet under construction.

Enrollments following some early years ups and downs are now strong.

Placement of graduates has developed well. SAI graduates commonly aspire to college level training and several have successfully pursued that goal. Female students are not admitted. Coeducational secondary institutions are not condoned as contrasted to the pre-secondary and post-secondary systems. With Yemen unification a SAI in Aden may need to be integrated into the SAI system.

There is a recognized need for PSAI level training of graduates to serve technical needs of a rapidly developing agricultural sector. This should take priority over any expansion of the SAI system except possibly a SAI for women.

A very serious and recognized administrative problem exists at the Ibb SAI which threatens its very viability. This must be remedied promptly or sustainability of that institute is moot. Otherwise sustainability of the SAIs is basically related to continuing strong commitment and support by the ROY.

D. Lessons Learned

1. A broader subproject scope to encompass the entire SAE system should have been defined at the outset.
2. A longer time frame was needed to establish a clearly sustainable SAE system.
3. A SAE teacher training program in the FOA should have been a targeted objective.
4. U.S training of all Yemeni teachers would have been of higher quality and lesser cost than in Egypt.
5. The role and responsibilities of the SAE teacher should have been emphasized more in recruiting.
6. American-Yemeni co-directors of the ISAI would have provided for more rapid development.
7. The ADSP concept (umbrella) of a system of several subprojects was naive and unnecessarily complex.
8. The socio-cultural and tradition constraints are strong and precluded female admissions, the great need for training women in agriculture notwithstanding.
9. The standard world-wide secondary school facility design of the WB requires extensive adaptation for SAI usage.

E. Major Recommendations

1. That there be a modest (perhaps \$200,000/year) continuation of USAID assistance for at least three years to further guide development and institutionalizing of the SAE system; with particular emphasis on strengthening the DAE, as well as general advisory inputs and administrative development.
2. That the administrative structure be given prompt attention to (1) remedy the serious problem at Ibb with a change of leadership and (2) assure that in the unification organization, the cognizant Ministry for the DAE be committed to the system and establish linkages to other relevant Ministries.
3. That the curriculum be given continuous review and updating to changing conditions, needs and technology.
4. That SAI staff development and technical maintenance be encouraged and provided for through special seminars, resource materials, annual evaluations and tangible recognitions.
5. That SAI operating budgets, already largely supported by the ROY be increased to more adequate levels and to offset phase-out of AED project inputs; 1991 increases of 25% at Ibb and Surdud and even more at Sana'a for new SAI program added to the SVS program.
6. That for facilities the serious structural failure problem at Ibb be addressed; increase land area and dormitory capacity at Sana'a; a funded

continuing maintenance program at each SAI; establish equipment inventory and repair systems at each site; and complete food technology facility at Ibb.

7. Teaching materials development and updating should be a continuing process; additional reference texts, new and updating of instruction modules, teaching resources center expansion and updating, and staff rewards for contributing to these processes.

8. Further development of SAI outreach to the community and region, alumni follow-up, contacts and utilization for advisory inputs, and political support.

9. Additional SAIs should not be pursued until present units are more established and unless a clearer need for more emerges; exceptions being integration of SAI at Aden and possibly one for women.

10. Establishment of one or more PSAIs should be considered (outside Sana'a); perhaps converting the Ibb SAI for highlands and Aden for coastal needs.

11. The FOA at Sana'a together with one at Aden should be strengthened and should be very sufficient for Yemen; that the idea of establishing a FOA at Ibb is not appropriate in terms of location or need.

**K. ATTACHMENTS (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier)**

Final Evaluation Report with Annexes of SECONDARY AGRICULTURAL INSTITUTE  
Subproject of ADSP - September, 1990

**L. COMMENTS BY MISSION, AID/W OFFICE AND BORROWER/GRANTEE**

ANNEX 3

Persons Contacted

## ANNEX 3

### Persons Contacted

#### 1. In USAID/W

Mohamed Cassan	ANE, Private Sector Office
Peter Dienkin	ANE, Yemen Desk Officer
Diane Ponacek	ANE, Evaluation Officer
Leland Voth	ANE, ARD Officer

#### 2. In USAID/Y

Philip M. Gary	Acting Mission Director
Jonathan Addleton	Program Officer (and Evaluation Officer)
Jamil Baidani	Agricultural Specialist
Roger Bloom	Agr. Dev. Office
Nasr Al-Ghoorairy	Agricultural Specialist
Abdel Moustafa	Acting Agr. Dev. Officer
Robert Schmeding	Educ. and H.R. Officer
Abdulali Al-Shami	Program Specialist
Kamal Siddik	Agricultural Specialist
Frederick Vigil	Agr. Dev. Office

#### 3. In ROY Ministries

Muhammad Al Jafiy	Minister of Education
Moqbil Ahmed Moqbil	Deputy Minister, MAWR
Abu Jaradah	Dir. of Statistics, MOP
Fatima Sadel	Asst. Dir. Gen., Sec. Educ., MOE

Mohamed H. Alyarimi	Advisor of the MOE
Mohamed Al-Harazi	Director of Agr'l Educ., MOE
Azhari Babiker	Ministers Office, MAWR
Jamil Al-Sakri	Head, Arab Coop. Council, MAWR

4. In Development Projects

Sunny Langham	Team Leader, ISAI/AED
Mary Reynolds	Asst. Team Leader, ISAI/AED
Harold Matteson	Subproject Dir., NMSU
James Collom	Assoc. Exec. Dir., CID
Hanna Redman	Sec., ISAI/AED; Student at SU
Stanley Miller	Team Leader, FOA Subproject
Nureddin Jaqieddin	UNDP/WB Support Project
Maim Sefein	Chief of Party, EDSP

5. At the SAI Locations

Omar Al-Rifi	Director, SVS
Moused Al-Namer	Director, SSAI
Jamal Rasson	Director, ISAI
Mohamed Haddad	Asst. to Governor, Ibb

(Numerous faculty and graduates interviewed anonymously)

6. Graduate Employers Representatives

Matiyub Abdula	Veterinarian, TDA
Lotf Al-Ansi	Director General, SURDA
Yasin A. Galeb	Extension Specialist, SURDA

H. Harricharan	Extension Specialist, TDA
Nadha Helenry	Home Economics Spec., TDA
Houria K. Khateb	Home Economics Spec., TDA
Khald Mohammed	Veterinarian, TDA
Moused Al-Namer	Director, SSAI
Jamal Rasson	Director, ISAI
Omar Al-Rifi	Director, SVS/SAI

7. Others

Jerry Oweis	Country Programs Chief, BIFAD, USAID W
Dennis Wood	V. P., Devres, Inc.
William Davis	Proj. Coordinator, Devres, Inc.

ANNEX 4

Reference Documents Used

## ANNEX 4

### Reference Documents Used

- Adra, N. Results of a Survey to Determine the Appropriateness of Training at ISAI for Graduates Employment, CID and MOE 1984
- Adra, N. Suggestions for Increasing Involvement of Women in Agricultural Education Activities and for Increasing the Impact of SAE in Yemen on Women Farmers, CID and MOE 1984
- CID Ibb Agricultural Training Center, Subproject Paper, USAID/Y 1979
- CID Life of Project Work Plan for the ISAI in Yemen, 1981
- CID ISAI Phase II Subproject Paper, USAID/Y 1985
- CID Review of Secondary Agricultural Schools in Yemen, USAID/Y and MOE 1987
- CPO YAR Statistical Year Book, 1988
- DAI ISAI External Evaluation, USAID/Y 1984
- ISTI Midterm Evaluation of the Faculty of Agriculture Subproject of the ADSP, USAID/Y 1990
- Kugler, H.L and Khaldi, N. Preliminary Design for the Development of the Agricultural Training Center; OICD-USDA, 1979
- Law, G.R. and Collom, J.L. The Status of Current Academic Participant Training Programs Conducted for the ADSP and Improved Procedures for Their Administration, CID, 1987

McVey, G.C. and Harazi, M.A. Post-Secondary Agricultural  
Institute Feasibility Study, NMSU and MOE, 1988

MOE The Bylaws of the ISAI, MOE, 1980

NMSU Enhancing the Future Effects of the ISAI Subproject - A  
Concept Paper, 1987

NMSU Proposal for Continued Support for the DAE (Working  
Draft) 1990

Noland, W.G. ISAI Team Leaders End of Tour Report 1988

Pittibone, T.J. and Aboul-Seoud, K.H. Instructional Improvement  
at the ISAI, an Internal Evaluation, 1986

Pragma, Inc. Yemen ADSP External Evaluation, USAID/Y 1984

Sallam, H.H. ISAI Directors Report 1988

Saud, K.A. and Adra, N. The First Graduating Class of the ISAE  
with Current Places of Employment, CID and MOE 1984

UNIDA Industrial Development Review - Diversifying the  
Industrial Base, YAR, 1989

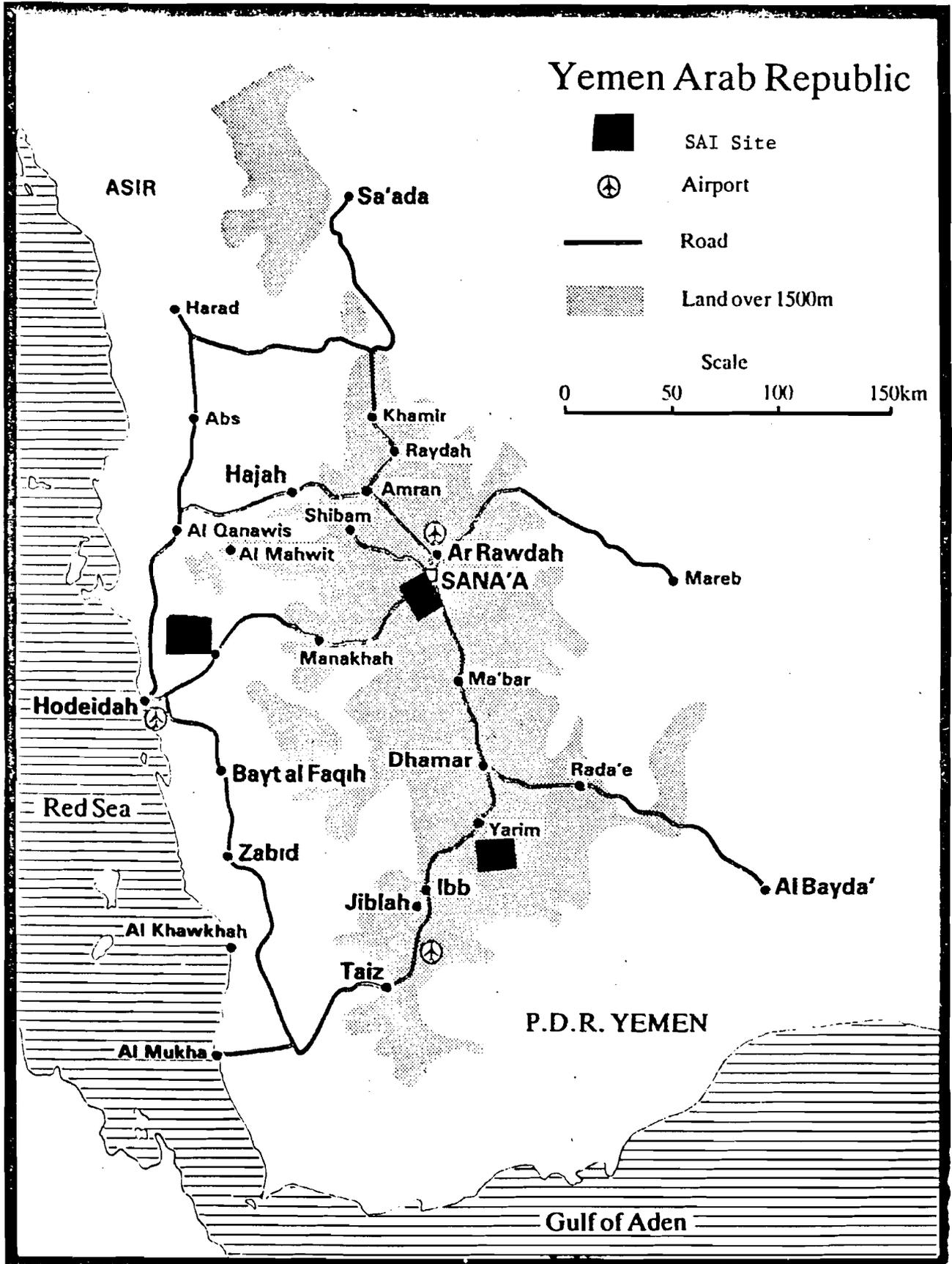
USAID/W and CID Collaborative Assistance Contract for  
Agricultural Development Support Program, 1980

USAID/Y ISAI Project Implementation Report (PIR) 1990

ANNEX 5  
Map of Yemen

ANNEX 5

Map of Yemen



ANNEX 6

Logical Framework - Phases I and II

ANNEX 6

Logical Framework - Phases I and II

PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project: From FY 1980 to FY 1984  
Total U.S. Funding: \_\_\_\_\_  
Date Prepared: \_\_\_\_\_

Project Title & Number: Yemen Ibb/Agricultural Training Center

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>Improve the welfare of Yemen's rural population</p>	<p>Measures of Goal Achievement:</p> <ul style="list-style-type: none"> <li>-manpower needs met for middle level skills in YARG</li> <li>-improved agricultural production resulting in reduced food imports</li> </ul>	<p>Ministry of Agriculture records</p> <p>YARG Development Plan records</p>	<p>Assumptions for achieving goal targets:</p> <p>Graduates become employed in the rural and governmental sector</p>
<p>Project Purpose:</p> <p>Establish within Yemen a largely localized training institution capable of serving governmental and rural sector needs</p>	<p>Conditions that will indicate purpose has been achieved: End of project month.</p> <ul style="list-style-type: none"> <li>-An established 3-year training producing 90 grads at Certificate level annually.</li> <li>-Staffed with local staff men</li> <li>-Staffed with localized administration and skills upgraded</li> <li>-Curricula &amp; teaching techniques which provide training in skill areas to meet YARG needs</li> </ul>	<ul style="list-style-type: none"> <li>-Ibb/ATC records</li> <li>-Contractors records</li> </ul>	<p>Assumptions for achieving purpose:</p> <ul style="list-style-type: none"> <li>Sufficient number of students will seek enrollment annually to maintain total 270-90 per year</li> <li>Attrition of students enrolled at Ibb/ATC will be minimal</li> <li>Attrition of Graduates from Ibb/ATC working with MOA is minimal</li> <li>YARG can continue to absorb recurrent costs</li> <li>YARG to see training of staff as a high priority</li> </ul>
<p>Outputs:</p> <ul style="list-style-type: none"> <li>-staff trained</li> <li>-facilities completed &amp; equipped</li> <li>-teaching materials developed</li> <li>-curricula created for certificate level</li> <li>-administrative procedures developed</li> </ul>	<p>Measures of Outputs:</p> <ul style="list-style-type: none"> <li>-staff trained assigned to teaching jobs/</li> <li>-laboratory equipment supplied by IBRD/IDA installed &amp; operational</li> <li>-administration capable of supporting 270 students annually</li> <li>-short course and in-service training programs for farmers and extension workers developed and in operation</li> </ul>	<ul style="list-style-type: none"> <li>-Ibb/ATC records</li> <li>-AID and contractor records and evaluation reports</li> </ul>	<p>Assumptions for achieving outputs:</p> <ul style="list-style-type: none"> <li>AID project funds remain available</li> <li>Yemen staff available for training</li> <li>Attrition of Yemen staff is minimal</li> <li>Staff receptive to curriculum and teaching techniques</li> <li>training offered by Ibb/ATC</li> </ul>

Inputs	Implementation	Means of Verification	Important Assumptions
<p><u>USAID</u></p> <ul style="list-style-type: none"> <li>-Funds for</li> <li>-technical assistance</li> <li>-training</li> <li>-consultancies</li> <li>-funding</li> </ul> <p><u>YARG</u></p> <ul style="list-style-type: none"> <li>-personnel (salaries)</li> <li>-land for school site</li> <li>-operating budget</li> <li>-housing for YARG and Expatriate staff</li> </ul>	<p><u>USAID</u></p> <ul style="list-style-type: none"> <li>-Director</li> <li>-9 resident specialists</li> <li>-TDY support</li> <li>-30 M.S. degrees</li> <li>-12 B.S. degrees</li> <li>-120 pm non academic training</li> <li>-4 vehicles</li> <li>-equipment and supplies</li> <li>-furniture and mobile homes for Expatriate staff</li> </ul> <p><u>YARG</u></p> <ul style="list-style-type: none"> <li>-Director</li> <li>-professional staff</li> <li>-support staff</li> <li>-47 hectares of land</li> <li>-budget for students, supplies and farm operation</li> </ul>	<ul style="list-style-type: none"> <li>-Ibb/ATC records</li> <li>-AID and contractor records</li> </ul>	<ul style="list-style-type: none"> <li>-Budgetary support is available</li> <li>-Students are variable</li> <li>-country has absorptive capacity for trainees</li> <li>-sufficient number of candidates available for training</li> </ul>

PROJECT TITLE: Ibb Secondary Agricultural Institute Subproject  
 Agricultural Development Support Program (Project 279-0052)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
PROGRAM GOALS	MEASURES OF ACHIEVEMENT	MEANS OF VERIFICATION	ASSUMPTIONS
GOAL:			
*To increase income and improve the quality of life for rural inhabitants in the YAR through agricultural development.	*Increased agricultural production. *Improved agricultural trade balance. *Consumption by rural families increased.	*Improvement in quality of life. *YARG statistics. *Socio-economic analyses.	*Agriculture will remain an important economic activity in rural Yemen.  *YARG taxing and pricing  Policies will allow families to derive the benefits of increased production
SUBGOAL:			
*To increase the supply of appropriately trained Yemeni men and women capable of performing mid-level technical and management tasks in the public and private agricultural sector.	*Increased number of trained Yemeni men and women working in agriculture and rural development and a corresponding decrease in expatriates in mid-level positions.	*YARG employment data. *MOE and MAF records on expatriate involvement in education and rural development.	*There will continue to be a demand for trained Yemeni personnel in the agricultural sector.  *Mid-level agriculture technicians will increase agricultural productivity.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
SUBPROJECT PURPOSE	CONDITIONS INDICATING ACHIEVEMENT	MEANS OF VERIFICATION	ASSUMPTIONS
<p>*To improve the efficiency of the secondary agricultural education system of the MOE to supply Yemen's agricultural sector, including both the MAF and the private sector, with qualified manpower.</p>	<p>*Technical agricultural secondary schools, i.e., Ibb, Surdud, and the Sanaa Veterinary School: bring student enrollment and output capacity in line with design expectations for each school. Schools staffed with well-qualified Yemeni administrative support employees; supplied with curricula, Arabic textbooks, student handouts, training techniques; and facilities designed to provide students with educational programs relevant to Yemeni agricultural conditions and responsive to the needs of the YAR.</p>	<p>*School records, MOE records, survey and feasibility reports, and evaluation reports.</p>	<p>*YARG will continue to view agricultural education as an important part of the educational system in Yemen and highly beneficial to the population.</p> <p>*YARG will provide support for improving educational methods, subject matter, student attendance, and staff development to the three schools.</p> <p>*YARG will continue to provide secondary agricultural education rather than turning it over to the private sector.</p> <p>*YARG will support Yemeni staff members.</p>

NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS

SUBPROJECT OUTPUTS

MAGNITUDE OF OUTPUTS

MEANS OF VERIFICATION

ASSUMPTIONS

1. Each SAI fully staffed with trained Yemeni agricultural teachers, administrators, and a farm manager. The staff will be able to devise performance-based curricula, achieve practical applications, and conduct appropriate outreach activities without detriment to the secondary certificate standards of the MDE.

1. Ten trained Yemeni staff in place at the ISAI, 10 at the SSAI, and 5 at the SVS. Short courses and in-service training programs for farmers and extension workers, and special programs designed to reach women are developed and in operation at each SAI.

\*School records, records of USAID and contractors, MOE records, internal evaluation reports, and external evaluation reports.

\*The YARG will accept and support all non-academic and informal education programs, particularly those aimed at women.

2. A relevant curriculum at each SAI with identified practicums and outreach activities.

2. One curriculum at each SAI.

\*Participant teacher trainees will continue to be nominated by the MOE for BS or MS degree training, who have acceptable transcripts.

3. Educational facilities adequately equipped and refurbished to deliver the curriculum.

3. At each SAI:  
 a. An operational instructional program.  
 b. A functional agricultural mechanics facility (except SVS).  
 c. An operational learning resources center.  
 d. A functional food science laboratory.

\*Strategies to increase enrollments to full capacity at each SAI developed and implemented on a continual basis.

4. Yemenized textbooks and other classroom materials prepared, and in use at each SAI.

4. Textbook and classroom materials in use for each agricultural subject area in the curriculum.

5. A student recruitment, evaluation and placement system functioning at each SAI and coordinated by the MOE sufficient to achieve enrollment and graduation goals.
5. Targeted graduation goals
- a. 40 graduates/yr at ISAI.
  - b. 35 graduates/yr at SSAI
  - c. 30 graduates/yr at SVS
6. Staff recruitment, retention, training ,and placement programs functioning in the MOE to replace staff and maintain the SAIs indefinitely.
6. A staffing plan implemented at each SAI.

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 NARRATIVE SUMMARY

OBJECTIVELY VERIFIABLE INDICATORS

MEANS OF VERIFICATION

IMPORTANT ASSUMPTIONS  
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\ SUBPROJECT OUTPUTS

MAGNITUDE OF OUTPUTS

MEANS OF VERIFICATION

ASSUMPTIONS

7. MOE management personnel trained in administration of agricultural education providing leadership, coordinating Yemen's agricultural education efforts, conducting long-range planning, and supervising the SAIs.

7. a. A staffed and functioning SAE administrative unit in the MOE under the Director of Agricultural Education.  
 b. A staff performance evaluation system in operation.  
 c. Evidence of delegation of authority and responsibility.  
 d. A monthly status report of the SAE.

8. Strategies and feasibility studies to make secondary agricultural education available in all areas of the country, including consideration of establishing additional SAIs on a regional basis, or for women.

8. Surveys and feasibility assessments completed.

9. Feasibility and need assessment of possible mid-level technical agricultural institute completed.

9. One survey completed.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
INPUTS	LEVELS OF EFFORT/EXPENDITURE	MEANS OF VERIFICATION	ASSUMPTIONS
<p>1. USAID Grant over a 6.25 year period.</p> <p>a. Training,</p> <p>    i) 39 BS &amp; MS scholarships for SAI &amp; MOE staff for a total of 106 p.y.</p> <p>    ii) Non-academic management training out-of-country for SAI &amp; MOE administrators, 60 p.m.</p> <p>    iii) Non-academic, in-country management training for MOE staff &amp; technical training for MAF extension personnel, 373 p.m.</p> <p>b. Technical assistance, 52.6 p.y.</p> <p>c. Instructional equipment and supplies.</p> <p>d. Special strategy and feasibility studies.</p> <p>2. YARG inputs</p> <p>a. Salaries and wages for SAI personnel.</p> <p>b. SAI operating costs.</p> <p>c. Expendable &amp; non-expendable equipment &amp; materials.</p> <p>d. Capital expenditures.</p> <p>e. Other direct costs.</p>	<p>1. USAID Dollar and Local currency budget, \$17 million (with inflation &amp; contingency)</p> <p>a. Training, \$2.72 million 1/</p> <p>b. Technical assistance, \$6.88 million. 1/</p> <p>c. Commodities, \$3.31 million. 1/</p> <p>d. Feasibility studies, \$0.05 million. 1/</p> <p>2. YARG Budget, \$11.97 million</p> <p>a. Personnel, \$4.1 million</p> <p>b. Operations, \$0.4 million</p> <p>c. Commodities, \$3.0 million</p> <p>d. Capital expenditures, \$3.3 million.</p> <p>e. Other, \$1.2 million.</p>	<p>*USAID Subproject Agreement(s).</p> <p>*YARG budget and record of budget allocations.</p> <p>*NMSU contract.</p>	<p>*USAID grant to support subproject will be approved and funds will be released.</p> <p>*USAID and YARG commitment to support of subproject will remain strong throughout the life-of-project.</p> <p>*YARG will contribute YF 11.97 million over the life-of-project, which includes a budget for operating each school, insuring program support at the level required by new and growing institutions, and an increasing assumption of recurring costs.</p>

1/ Exclusive of inflation and contingencies

ANNEX 7

Graduates Survey Form

ANNEX 7

Graduates Survey Form

**SAI FORMER STUDENT EVALUATION**

Date \_\_\_\_\_ Time \_\_\_\_\_ Place \_\_\_\_\_ Interviewer \_\_\_\_\_

BACKGROUND INFO:

SAI Attended \_\_\_\_\_ Graduated (Academic Year) \_\_\_\_\_  
 Current Occupation \_\_\_\_\_ With \_\_\_\_\_  
 Father's Occupation \_\_\_\_\_  
 Major Agriculture Experience(s) Prior to Admission to SAI \_\_\_\_\_  
 \_\_\_\_\_  
 Home Village \_\_\_\_\_

PLACEMENT/ASSIGNMENT INFO:

Assignments Following Graduation Including Scholarships and  
 Voluntary Government/Military Service:

1. \_\_\_\_\_ With \_\_\_\_\_
2. \_\_\_\_\_ With \_\_\_\_\_
3. \_\_\_\_\_ With \_\_\_\_\_

EVALUATION OF SAI PREPARATION:

	Gen. Edu				Tech. Agr.			
	E	G	P	NR	E	G	P	NR
<u>Instructors</u>								
Subject Matter Knowledge								
Teaching Know-how								
Previous Preparation								
Actual Experience								
Ability to Communicate and/or Relate to Students								
<u>Instruction</u>								
Lectures								
Labs								
Practicals								
Work Experiences								
Student Plots								
Examinations								
Related Teaching/AV Materials								
Textbooks								
<u>Library</u>								
<u>Curriculum</u>								
General Curriculum								
Technical Agriculture								
Agricultural Mechanization								
Animal & Poultry Production								
Beekeeping								
Crops								
Extension								
Farm Management								
Food & Dairy Technology								
Horticulture								
Plant Protection								
Soils								

SUGGESTIONS:

ANNEX 8

Employers Survey Form

Employers Survey Form

**SAI EMPLOYER SURVEY**

Date \_\_\_\_\_ Time \_\_\_\_\_ Place \_\_\_\_\_ Interviewer \_\_\_\_\_

AGENCY INFO: Representative: \_\_\_\_\_ Section: \_\_\_\_\_

SAI EMPLOYEE INFORMATION:

1. Number of graduates employed \_\_\_\_\_

2. Lengths of service (range) \_\_\_\_\_ to \_\_\_\_\_

3. How have these graduates satisfied your needs

4. Major deficiencies

5. Training recommendations

ANNEX 9

Summary of Inputs

# ANNEX 9

## Summary of Inputs

### YEMEN PROJECT WORKPLAN #1-10 CUMULATIVE REPORT FEBRUARY, 1990

1/90  
:

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 1-4-22750/59	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	\$159,223.07	\$103,671.21	\$131,007.33	\$119,606.60	\$81,823.32	\$103,043.82	\$48,693.02	\$26,188.14	\$984,370.3
Off Campus	\$256,628.90	\$296,170.82	\$556,886.61	\$472,001.62	\$446,862.16	\$405,303.26	\$173,793.83	\$167,370.90	\$102,186.31	\$32,349.77	\$2,911,934.0
Fringe Benefits	\$32,741.31	\$50,965.89	\$103,378.17	\$123,373.75	\$95,207.96	\$109,459.83	\$61,899.87	\$61,324.90	\$33,918.89	\$12,187.42	\$684,637.9
Allowances	\$1,750.00	\$19,376.68	\$65,171.99	\$29,137.69	\$7,982.04	\$7,344.73	\$31,962.86	\$31,324.13	\$32,602.79	\$27,206.34	\$252,039.4
Participant Training	\$0.00	\$74,943.91	\$219,938.74	\$127,496.12	\$98,864.67	\$115,330.93	\$37,341.13	\$127,339.95	\$34,261.67	\$9,403.92	\$845,161.0
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	\$90,073.83	\$79,694.36	\$73,968.45	\$44,324.38	\$82,200.16	\$41,281.18	\$36,339.41	\$42,242.32	\$36,020.73	\$20,244.42	\$546,589.41
Expendable Supplies	\$43,978.00	\$49,613.63	\$41,893.20	\$36,404.04	\$110,617.68	\$184,197.29	\$73,136.49	\$103,011.33	\$49,692.36	\$20,378.82	\$632,913.04
Non-Expendable Supplies	\$7,292.37	\$15,301.23	\$128,920.68	\$118,051.63	\$23,714.24	\$80,398.75	\$51,886.64	\$44,188.99	\$87,489.76	\$11,288.43	\$588,332.94
Halliers	\$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	\$318,313.98	\$39,160.91	\$148,143.33	\$22,262.20	\$14,916.77	\$82,093.64	\$95,682.30	\$113,389.89	\$44,242.29	\$0.00	\$878,427.31
Other Direct Costs	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$9,703.97	\$3,911.32	\$13,615.29
<b>TOTALS</b>	<b>\$1,326,194.00</b>	<b>\$649,294.78</b>	<b>\$1,493,343.04</b>	<b>\$1,076,922.44</b>	<b>\$1,011,373.01</b>	<b>\$1,839,016.13</b>	<b>\$645,867.87</b>	<b>\$814,238.65</b>	<b>\$478,815.81</b>	<b>\$163,338.80</b>	<b>\$8,720,627.61</b>
Indirect Costs	\$278,462.12	\$232,975.88	\$300,890.60	\$246,006.23	\$221,719.79	\$193,649.29	\$118,776.59	\$207,375.23	\$117,076.18	\$53,370.06	\$1,752,313.21
<b>TOTALS EXPENDED</b>	<b>\$1,604,656.12</b>	<b>\$882,270.66</b>	<b>\$1,794,233.64</b>	<b>\$1,322,928.67</b>	<b>\$1,233,112.80</b>	<b>1,252,665.42</b>	<b>\$764,644.46</b>	<b>\$1,021,613.88</b>	<b>\$595,891.99</b>	<b>\$216,708.86</b>	<b>\$10,472,940.82</b>

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BREAK-DOWN OF COMMITMENTS/EXPENDITURES UNDER ISAI SUB-PROJECT  
AS OF 06/30/90

<u>ELEMENT DESC.</u>	<u>COMMITMENT</u>		<u>EXPENDITURE</u>	
	<u>1698 CONTRACT</u>	<u>OTHER USAID</u>	<u>1698 CONTRACT</u>	<u>OTHER US</u>
TECH. ASSISTANCE	5,194,625	2,002,820	5,044,441	1,947,16.
TRAINING	1,468,148	447,437	1,409,676	419,787
COMMODITIES	2,839,552	350,492	2,711,546	347,29.
OTHER EXPENSES	1,436,571	1,806,021	1,386,987	1,806,02.
ADMIN - USA	1,597,104	200,000	1,502,932	200,000
TOTAL	12,536,000	4,806,770*	12,055,582	4,720,268

\* THESE INCLUDE AN OBLIGATION OF \$195,741 under the CID CONT # 1613 WHICH WAS USED AT THE DESIGN STAGE OF THE PROJECT.

PREPARED BY: O/CON:  H ABDULGHANY: 08/07/90

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SAI OPERATING COSTS AND REVENUES  
By MOE (Revenues are not retained by SAIs)  
(Y.R.)  
(Agriculture staff salaries included)

Year	Ibb		Surdud		Sana'a	
	Exp.	Revenue	Exp.	Rev.	Exp.	Rev.
1981-82	1,514,002	96,461	1,089,610	10,415	285,470	
1982-83	1,616,216	82,311	1,343,740	56,487	273,380	
1983-84	1,674,450	169,792	1,616,250	43,248	265,309	431,970
1984-85	1,236,600	257,308	1,836,574	134,871	460,080	1,558,660
1985-86	1,215,000	260,180	2,011,036	128,300	602,480	1,834,821
1986-87	2,117,013	223,891	2,065,959	300,000	638,480	2,175,238
1987-88	2,143,888	368,151	2,522,886	266,952	674,480	1,497,190
1988-89	2,166,500		2,255,500	119,000	1,855,700	279,800

SAI INVESTMENTS IN FACILITIES  
By MOE and IBRD (World Bank)  
(Not including land, roads and utilities)  
(Y.R.)

	Cost of Building	Cost of Equipment
1. ISAI	14,736,876	7,921,300
2. Surdud	19,918,655	6,935,750
3. Vet. School	14,734,183	647,913
Total	49,389,714	15,504,963

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ANNEX 10

List of Books Written

## ANNEX 10

List of Books Written

## STATUS OF AGRICULTURAL TEXTBOOKS

Title	Reviews		Comments
	Technical	Grammar	
1. *Surveying, Practical-1st yr.	x	x	Printed-in use
2. *Surveying, Theoretical-1st yr.	x	x	Printed-in use-IBB (need to check for accuracy)
3. *Workshop, 1st yr.	x	x	Printed-in use
4. Ag. Mechanics.-Tractors & Engines	x		Needs revision
5. Ag. Mechanics, Theoretical-3rd yr.	x		Needs revision
6. Crops, 1st yr.	x		Needs revision
7. Crops, 2nd yr.	x		Needs revision
8. Crops, 3rd yr.	x	x	Needs revision
9.*Soils, 2nd yr.	x	x	Sent to Khairy-DHL April 5,88 to be printed
10. Soils, 3rd yr.	x	x	To be revised
11.*Ag. Extension, Theoretical-3rd yr.	x	x	Printed-in use
12.*Ag. Extension, Practical-3rd yr.	x	x	Printed-in use
13.*Ag. Extension, Theoretical-2nd yr.	x	x	Printing in process
14. Ag. Extension, Practical-2nd yr. (to be divided between 1st yr. & 2nd yr.)			Under contract
15.*Ag. Accounting, Practical	x	x	Printed-in use
16.*Food Technology, Practical	x	x	Printed-in use
17. Animal Production, Practical			Under review in IBB by Sabri

\* \* \* Textbooks are completed and in use at SRI, 1990

ANNEX 11

List of Instruction Modules Developed

1/2

## ANNEX 11

### List of Instruction Modules Developed

#### 1.0.0 ANIMAL SCIENCE

##### 1.1.0 First Year

- 1.1.1 Introduction to Animal Science
- 1.1.2 Local and International Breeds
- 1.1.3 Methods of Animal Control
- 1.1.4 Livestock Farm Operations
- 1.1.5 Veterinary Activities
  - Health & Sickness Symptoms of Animals & Poultry & Preventive Measures
- 1.1.6 Movement System
- 1.1.7 Digestive System
- 1.1.8 Reproduction System
- 1.1.9 Nervous System
  - Breathing System
  - Blood System
  - Waste Disposal System

##### 1.2.0 Second Year

- 1.2.1 Housing
- 1.2.2 Hatching
- 1.2.3 Incubation
- 1.2.4 Records

##### 1.3.0 Third Year

- 1.3.1 Delivery & Young Animal Care
- 1.3.2 Milk Production (Milking Methods)
- 1.3.3 Egg Production
- 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 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 Crops in Yemen
- 2.2.7 Selection & Distribution of Propagation Fruit Trees

## 2.3.0 Third Year

- 2.3.1 Quality of Popular Vegetable Plants in Yemen
- 2.3.2 Cultivation of Popular Vegetable Plants 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

### **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

#### **3.3.0 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 CROPS**

#### **4.1.0 First Year**

- 4.1.1 World Crops and Their Classification

#### **4.2.0 Second Class (All by Ayman Menshor/SSAI)**

- 4.2.1 Summer Fiber Crops (Cotton)
- 4.2.2 Summer Cereal Crops
- 4.2.3 Summer Silage Crops
- 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 Alfalfa (Sudanese Grass)

#### **4.3.0 Third Class**

- 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 Gas & 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

## 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 Solutions
- 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 Development
- 7.1.7 Planning Extension Programs

### 7.2.0 Second Year (Agricultural Extension)

#### 7.2.1

### 7.3.0 Third Class

- 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 Class (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 IX - 2 YEAR

##### 9.1.0 First Year

##### 9.2.0 Second Year

- 9.2.1 Importance of Plant Protection
- 9.2.2 Insects & Disease Collections
- 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 & Describing Plant Diseases & Its Causes
- 9.2.8 Quarantine Regulations

##### 9.3.0 Third Year

- 9.3.1 Spraying & Dusting & Fumigating Equipment

10.0.0 BEE KEEPING

10.1.

10.2.

10.3.0 Third Year X

10.3.1 Introduction

10.3.2 Members of the Bee Kingdom

10.3.3 Construction of Apairaries

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

ANNEX 12

List of Participants, Degrees and Institutions

## ANNEX 12

List of Participants, Degrees and Institutions

## ISAI PARTICIPANT TRAINING

Name of Participant	Subject of Study	Training Institution	Start Date	Ending Date
Abdalla Mohad al-Dubai	Horticulture	New Mexico State Univ.	13-Apr-83	30-Mar-86
Abdalla Mohamed al-Dobae	Nur. Operation	Voc. Tech. High School	06-Jul-87	20-Aug-87
Abdu Ahmed M. Mukbil	Gen. Agricultural	University of Zagazig	28-Oct-83	01-Jun-87
Abdul Galil Y. Abdul-Wali	Gen. Agricultural	University of Zagazig	01-Oct-83	01-Jun-87
Abdul Karim M. A. al-Ashwal	Gen. Agricultural	University of Zagazig	01-Oct-82	01-Jun-86
Abdul Karim Qaied S. al-Tam	Gen. Agricultural	University of Zagazig	27-Oct-83	01-Jun-87
Abdul Karim Saeed Kassim	Agr. Education	New Mexico State Univ.	15-Aug-81	01-Jun-84
Abdul Rahman Saif Maky	Gen. Agricultural	University of Zagazig	28-Oct-83	01-Jun-87
Abdulaziz Mahyoub al-Wahesh	Agric. Education	Mushtaher Ag. Institute	10-Mar-85	30-Sep-87
Abdulbari Abdulrub	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Abdulgelil Ali Saleh	Gen. Agricultural	University of Zagazig	01-Oct-82	01-Jun-86
Abdulilah Dmar A.S. al-Aghbar	Agric. Education	Mushtaher Ag. Institute	10-Mar-85	30-Jun-87
Abdulrahman Mohd Bishr	Gen. Agricultural	University of Zagazig	01-Oct-82	01-Jun-86
Abdulrub A. A. Qadasi	Agric. Education	Mushtaher Ag. Institute	10-Mar-85	30-Jun-87
Ahmed Abdo Saif	Agr. Education	New Mexico State Univ.	01-Aug-81	01-Jun-84
Ahmed I. Saif al-Sabri	Agr. Education	New Mexico State Univ.	25-Mar-83	30-Mar-85
Ahmed Ibrahim S. al-Sabri	Art. Insem. Trng.	New Mexico State Univ.	06-Jul-87	20-Aug-87
Ali Ahmed K. al-Shooga	Gen. Agricultural	University of Zagazig	27-Oct-83	01-Jun-87
Ali Hamoud Ali Taher	Gen. Agricultural	University of Zagazig	01-Oct-82	01-Jun-86
Aliu Kassim Ismail	Agr. Education	New Mexico State Univ.	01-Aug-81	01-Jun-84
Ameen Saif Obaid	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Fuad Thabet al-Saghir	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Samal Abdo A. Saad	Gen. Agricultural	University of Zagazig	01-Oct-82	01-Jun-86
Hassan Kassim Khalil	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Hayel Haider Sallan	Agr. Education	New Mexico State Univ.	25-Mar-83	01-Mar-86
Hussein Mohd F. al-Madhaji	Agr. Education	New Mexico State Univ.	15-Aug-81	01-Jun-84
Ismail A. Rahman al-Haddad	Agr. Education	University of Zagazig	30-Jan-86	30-Jun-88
Ismail A. Rahman al-Haddad	Soil Survey	New Mexico State Univ.	01-Sep-81	30-Sep-83
Jamal Aldein Mohd Rassam	Food Technology	New Mexico State Univ.	05-Jun-84	25-Jun-84
Jamal Aldein Mohd Rassam	Agr. Education	Mushtaher Ag. Institute	01-Sep-85	30-Dec-87
Kassim Saeed al-Madhigi	Agr. Education	University of Zagazig	20-Sep-85	30-Dec-87
Mansoor Ahmed al-Hamshbi	Agr. Education	New Mexico State Univ.	15-Aug-81	01-Jun-84
Mohamed Abdalla S. Othman	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Mohamed Abdalla al-Monify	Agric. Education	Mushtaher Ag. Institute	10-Mar-85	30-Jun-87
Mohamed Abdu al-Lawdhai	Gen. Agricultural	University of Zagazig	01-Oct-82	01-Jun-86
Mohamed Abdulhabib Radwan	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Mohamed Hassan Debwan Saleh	Agr. Education	New Mexico State Univ.	01-Jan-87	30-Sep-90
Mohamed Salem Haider	Agr. Education	New Mexico State Univ.	15-Jul-82	26-Aug-85
Mortada Iaher Yazim Salem	Gen. Agricultural	University of Zagazig	01-Oct-82	01-Jun-86
Mutaher Sharaf M. Shaiban	Agr. Education	University of Zagazig	20-Sep-85	30-Dec-87
Mabil Abdulkarim al-Ansi	Agr. Education	University of Zagazig	20-Sep-85	30-Dec-87
Nagi Mohamed Saif Ibrahim	Gen. Agricultural	University of Zagazig	01-Oct-82	01-Jun-86
Saif Abdul K. Othman	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Saleh Abdalla H. Mothana	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Saleh Abdul A. al-Sherabi	Agr. Education	University of Zagazig	01-Oct-87	30-Sep-90
Saleh Mohad A. Othman	Horticulture	Cal Poly State Univ.	01-Aug-81	30-Sep-83
Taha Yassin S. al-Adeemi	Agr. Education	New Mexico State Univ.	29-Jun-85	30-Dec-87
Tawfik Saif Ahmed Abdalla	Agr. Economic	University of Zagazig	01-Oct-82	01-Jun-86
Yassin Thabit Salim	Gen. Agricultural	University of Zagazig	28-Oct-83	01-Jun-86

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**Number of Academic Trainees by Degree and Location**

DEGREE	LOCATION		TOTAL
	U.S.A.	EGYPT	
Ph.d	1	-0-	1
M.S.	11	18	29
B.S.	-0-	15	15
Total	<u>12</u>	<u>33</u>	<u>45</u>

**ANNEX 13**

**List of Long-Term Contractor Personnel**

## ANNEX 13

### List of Long-Term Contractor Personnel

ISAI Subproject  
Long Term Technical Assistance  
New Mexico State University

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	8/15/90
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	Present
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	2/25/91
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

**ANNEX 14**

**Enrollments at SAIs**

ANNEX 14

Enrollments at SAIs

Year	Ibb		Surdud		Sana'a Vet.	
	Admitted	Graduates	Admitted	Graduates	Admitted	Graduates
79/80	53	-	-	-	-	-
80/81	23	-	-	-	-	-
81/82	32	48	30	-	-	-
82/83	47	28	24	-	7	-
83/84	33	34	18	30	22	-
84/85	28	34	22	24	14	7
85/86	41	29	36	17	27	16
86/87	79	16	63	21	11	10
87/88	85	20	55	31	24	16
88/89	55	70	31	65	34	18
89/90	42	50	39	58	49*	17

\*22 - General Agriculture - 1st group

27 - Veterinary

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ANNEX 15  
Staffing of SAIs

ANNEX 15

Staffing of SAIs

Year	Admin.			Instructors			Technicians			Labourers		
	Ibb	Surdud	Vet.	Ibb	Surdud	Vet.	Ibb	Surdud	Vet.	Ibb	Surdud	Vet.
79/80	5	-	-	8	-	-	7	-	-	16	-	-
80/81	7	-	-	16	-	-	8	-	-	18	-	-
81/82	7	5	-	14	4	-	5	2	-	24	17	-
82/83	7	5	3	13	10	5	8	4	5	26	20	11
83/84	7	6	4	15	9	6	7	4	9	27	30	25
84/85	7	5	4	12	14	7	7	5		27	29	19
85/86	7	6	5	12	10	9	8	7	6	30	28	19
86/87	6	6	3	13	9	11	7	5	6	30	25	19
87/88	6	5	5	14	12	10	7	5	7	30	22	19
88/89	7	5	5	14	12	10	7	6	7	30	22	16
89/90	7	5	5	14	12	12	8	7	7			

\*Agriculture staffing only. Does not include general secondary education staffing.

ANNEX 16

Agricultural Sector Production and Export Data

## ANNEX 16

Agricultural Sector Production and Export DataAgricultural production, 1975-1991 (selected years)  
( '000 tons)

Crops	1975/6	1980	1984	1985	1986	1987	1991 <sup>a/</sup>
Cereals	940.0	798.0	372.2	419.3	666.0	665.0	820.4
- Wheat	62.0	65.0	37.3	63.4	85.0	100.0	200.0
- Maize	35.0	49.0	38.5	43.1	49.2	48.0	57.0
- Sorghum and millet	785.0	636.0	267.9	281.0	491.0	477.0	516.1
- Barley	58.0	48.0	28.5	31.8	40.8	40.0	47.3
Vegetables	335.0	472.0	578.8	610.4	687.4	603.5	880.1
- Tomatoes	...	...	...	...	111.4	...	142.2
- Onions	...	...	...	...	15.2	...	19.4
- Water-melon	...	...	...	...	75.0	...	95.7
- Dry legumes	76.0	84.0	37.6	44.2	46.8	39.0	62.6
- Potatoes	76.0	127.0	194.7	195.7	208.3	110.0	265.8
Fruit	113.3	138.3	183.3	185.9	233.4	264.9	315.0
- Dates	6.3	6.3	13.4	13.4	13.6	15.1	14.3
- Grapes	42.0	55.0	81.6	80.5	116.0	128.8	155.2
- Bananas	...	...	...	...	25.4	...	35.6
- Papayas	...	...	...	...	...	...	69.8
- Other fruit tree	65.0	77.0	88.3	92.0	28.6	121.0	40.1
Industrial crops	64.6	65.6	64.5	70.5	77.6	85.2	91.7
- Alfalfa	40.0	44.0	49.0	54.0	60.0	68.0	71.9
- Sesame	5.5	6.0	3.3	4.0	4.8	4.0	4.5
- Tobacco	5.6	7.0	4.3	4.5	4.5	4.8	5.2
- Cotton	13.5	5.0	3.7	4.0	4.2	4.2	4.9
- Coffee	3.0	3.6	4.2	4.0	4.1	4.2	5.2

Source: Central Statistical Organization, Statistical Year-book, 1987 and Third Five-Year Plan 1987-1991, 1986.

a/ Planned.

Exports of manufactured and processed goods,  
1987

Products	YR '000	Per cent
Food, beverages & tobacco	100,775	86.2
- Cigarettes	49,495	42.4
- Biscuits	43,069	36.9
Textiles and leather	6,134	5.4
- Leather (tanned)	5,496	4.7
- Bed linen	549	0.5
Chemicals and products	6,040	5.2
- Artificial leather	4,371	3.7
- Toilet soap	1,101	0.9
Metal & engineering products	1,897	1.6
Others	1,828	1.6
<b>Total</b>	<b>116,854</b>	<b>100.0</b>

Source: Compiled from the Ministry of Economy, Commerce and Supply, Directory of Trade Statistics, 1987 (in Arabic).

ANNEX 17

SAI Subjects and Studying Plan

## ANNEX 17

### SAI Subjects and Studying Plan

- I. The major interest of the Institute will be to educate agricultural technicians.
- II. The schedule is approved by the Agricultural Education Committee who makes any changes, additional remarks or cancels items concerning subjects and the educational plan according to the general benefit of agricultural education. The Agricultural Education Committee will be made up of the Director of Agricultural Education, Deputy Minister of Agriculture, Deputy to the President - University of Sana'a, three members from the CPO, Director of Extension - MOA, Director Vocational Education, and the Deputy Minister of Education for Academic Affairs.

#### The Weekly Distribution Schedule of the Subjects

SUBJECT	FIRST YEAR	SECOND YEAR	THIRD YEAR
General Knowledge	9	7	7
Basic Subjects	13	2	-
Ag. Technical Subjects	8	10	12
Practical & Field Training	14	20	19
TOTAL	44	39	38

GENERAL KNOWLEDGE:

Muslim Religion, Arabic, English Language, Social Sciences, and Gymnastics.

BASIC SUBJECTS:

Chemistry, Physics, Biology, Mathematics.

AG. TECHNICAL SUBJECTS:

Agricultural and its related subjects.

PRACTICAL AND FIELD TRAINING:

Training for Agricultural subjects in the lab, barns, farm, and in the local community.

COURSE OFFERINGS BY WEEK/YEAR

SUBJECT	1st Year		2nd Year		3rd Year	
	Theo.	Prac.	Theo.	Prac.	Theo.	Prac.
1. Religion	2	-	2	-	2	-
2. Arabic	2	-	2	-	2	-
3. English	2	-	2	-	2	-
4. National Soc.	2	-	-	-	-	-
5. Gymnastics	1	-	1	-	1	-
6. Mathematics	2	-	2	-	-	-
7. Chemistry	2	2	-	-	-	-
8. Physics	2	1	-	-	-	-
9. Biology	2	2	-	-	-	-
10. Crop Production and Soils	2	2	2	2	2	2
11. Horticultural	2	2	1	1	-	-
12. Plant Protection	-	-	2	2	-	-
13. Animal Production	2	2	1	3	2	2
14. Ag. Economics, Farm Management	-	-	-	-	2	1
15. Bee Keeping	-	-	-	-	2	2
16. Ag. Extension, Rural Sociology	1	1	1	2	2	2
17. Food Industry/ Milk Processing	-	-	1	2	1	2
18. Ag. Engineering	1	2	2	2	1	2
19. Extra Curriculum Activities	-	5	-	6	-	6
TOTAL	25	19	19	20	19	19

BEST AVAILABLE COPY

ACADEMIC PROGRAM OF SANAA  
VETERINARY SECONDARY SCHOOL

Courses	1st Year		2nd Year		3rd Year	
	Theory	Practical	Theory	Practical	Theory	Practical
Islamic Education	3	-	3	-	3	-
Arabic Language	3	-	3	-	3	-
Civics	2	-	-	-	-	-
English	2	-	2	-	2	-
Physical Training	-	1	-	1	-	1
Biology	1	1	-	-	-	-
Chemistry & Physics	2	2	-	-	-	-
Mathematics	3	-	2	1	-	-
Principles of Anatomy & Histology	3	3	-	-	-	-
Physiology	3	2	-	-	-	-
Vet. Methods	1	2	-	-	-	-
Principles of Genetics	2	2	-	-	-	-
Parasitology	2	-	-	-	-	-
Micro Biology	-	-	2	1	-	-
Pathology	-	-	2	1	-	-
Animal Hysbandery & Prod.	-	-	2	2	-	-
Bio-chemistry	-	-	2	2	-	-
Dairy Science	-	-	2	2	-	-
Animal Products Manufacturing	-	-	2	2	-	-
Animal Health	-	-	2	1	-	-
Economics of Farm Revenues	-	-	1	1	-	-
Internal & Contagious Diseases	-	-	2	-	3	-
Poultry Diseases	-	-	-	-	2	3
Pharmacology	-	-	-	-	2	1
Principles of Animal Surgery	-	-	-	-	1	1

Delivery Diseases &

Artificial Insemination	-	-	-	-	3	2
Food Control & Meat Exam.	-	-	-	-	1	2
Animal & Poultry Feeding	-	-	-	-	3	2
Lab Diagnosis	-	-	-	-	-	2

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ANNEX 18

Plan of Study for a Women's Secondary School  
in Areas of Food Technology and Nutrition

ANNEX 18

Plan of Study for a Women's Secondary School  
in Areas of Food Technology and Nutrition

THIRD YEAR		SECOND YEAR		FIRST YEAR		SUBJECT
PRACTICAL	THEORY	PRACTICAL	THEORY	PRACTICAL	THEORY	
-	3	-	3	-	3	ISLAMIC CULTURE
-	3	-	3	-	3	ARABIC
-	-	-	-	-	2	NATIONAL STUDIES
-	2	-	2	-	2	ENGLISH
-	2	-	2	-	2	MATHEMATICS
-	-	2	2	2	2	CHEMISTRY
-	-	-	-	1	2	GEOMETRY
-	-	-	-	2	2	BOTANY
-	-	-	-	2	2	ZOOLOGY
-	-	-	-	2	2	BACTERIOLOGY
-	-	2	2	-	-	FOOD TECHNOLOGY
-	-	2	2	-	-	NUTRITION
2	2	-	-	-	-	RURAL & HAND INDUSTRIES
2	2	-	-	-	-	DAIRY INDUSTRIES
-	-	2	2	-	-	MATERNAL & CHILD CARE
-	-	-	-	-	3	PUBLIC HEALTH
2	2	-	-	-	-	CLOTHING TEXTILE
2	2	-	-	-	-	MEAL PREPARATION
-	-	3	3	-	-	HORTICULTURE
2	2	2	2	-	-	POULTRY
-	-	-	-	2	1	ANIMAL PRODUCTION
2	2	-	-	-	-	BEE KEEPING
-	-	-	-	2	2	CROP PRODUCTION
2	2	2	2	-	-	EXTENSION

ANNEX 19

List of SAI Farms Development and Equipping Assistance  
by ISAI/AED Subproject

ANNEX 19

List of SAI Farms Development and Equipping Assistance

by ISAI/AED Subproject

Animal Science - Ibb

construction of dairy sheds  
installation of a complete milking system  
reworking of small animal facilities  
installation of bulk feed handling facilities  
fencing of pastures  
construction of a concrete and dirt silo  
artificial insemination equipment and methods

Animal Science - Surdud

construction of dairy sheds  
construction of a concrete silo

Animal Science - Livestock

Renovation of the dairy barn and milk equipment  
equipping veterinarian lab  
installation of livestock watering facilities  
duck raising facilities

Horticulture - Ibb

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

Horticulture - Surdud

installation of irrigation systems  
importation of various plant material

Horticulture - Livestock

construction of greenhouse  
construction of shade house  
development of propagation plots  
installation of irrigation systems

Agricultural Mechanics - Ibb

shop improvement  
equipment for shop instruction  
equipment for farm maintenance programs  
construction of store room for parts

Agricultural Mechanics - Surdud

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 and Field Crops - Ibb

installation of a soils testing lab  
introduction 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

**Agronomy, Soils and Field Crops - Surdud**

installation of flood and sprinkler irrigation systems  
silage cutting equipment  
development of student and demonstration plots  
renovation of irrigation well

**Agronomy, Soils and Field Crops - Livestock**

installation of flood and sprinkler irrigation plots  
development of small forage plots

**Food Processing - Ibb**

equipping the food processing laboratory  
installation of complete canning line  
food processing equipment

**Food Processing - Surdud**

small equipment and supplies for food processing

**Beekeeping - Ibb**

development of an apiary  
honey processing laboratory

**Beekeeping - Surdud**

development of an apiary

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ANNEX 20

List of Non-Expendable Equipment Purchased  
by the ISAI/AED Subproject

ANNEX 20

CAMPUS TRAILERS AND TRAILER EQUIPMENT (1-4-22720-807)

. Mobil homes and accessories - 9 ea		293,546.00
. Nu Matic Water Level Control		767.62
. Cat. Diesel Generator and accessories		17,810.00
. Engineers Dumpy Berger 18" Level, Model 05700N w/carrying case & access		355.00
. Mech. tool set		219.00
. Nu-Matic water level control		765.00
. Tires - 32 ea		849.90
. HO Industrial Recip saw		113.40
. Fire Hdrants MJ - 3 each @ 466.48		1,399.44
. Beckman Tech. 310 Digital Multimeter		140.00
. Concrete Mixer		991.19
. Water tanks (2)		3,171.81
. 40,000 Liter fuel tank		5,286.34
. 3/4 220 V. Motors - 10 @ 102.00		1,020.00
. 3W015 Gen.	)	1,295.00
. Saw	)	119.00
. 1P855 Pump	)	210.00
. 2Z406 Impact	)	184.25
. 2Z 677 Post Hole	)	320.00
. E Voc Pump	)	144.50
. Homelite 1500 Watt Gen.	)	341.16
. Sander-grinder	)	145.00
. Chain Saw	)	209.95
. Tri-stand Vise	)	236.44
. 1/2 - 1 threader	)	114.55
. Custom-Made Water Pump-Crane-Deming Unit 4358		
5 HP motor mount 3 phase 60HZ - 3 @ \$863.60		2,590.80
. 3 each Fire Hose Coupled M X F quick coupler, quick coupler adapter for fire plug attachment, 1½" fire nozzles w/female quick coupler		863.10
. 38'6"x146" 30 ga. galv metal roofing - 2 @ \$220.16		440.32
. 400 amp circuit breaker in a Nema enclosure		918.00
. 1 set mobile home water supply line crimping tools		178.80
. 2Z783 Comelong		179.82
. Voltmeter		104.00
. Drill ½		115.99
. Drill		129.00
. 2 - 1000 gallon hydro penumatic tanks w/12 inch base plates to be installed for tanks		4,370.00

Vo 00187

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PLERS AND TRAILER EQUIPMENT (1-4-22/20-807)

36. Articirc Cabinets- 10 ea	2,064.10
37. 225/200 AC/DC Arc Welder	1,800.00
38. Cerrco Master I Set	333.97
39. Purchas 2 @ 180.00	360.00
40. #25 Carbide Generator	762.32
41. 8x8x60" RT Gutter	154.00
42. 2 box - 38 W @ 2,050 ea	4,100.00
43. 1 box 35	1,350.00
44. #S65 0027 Am Electric 400 Watt fixture - 4 ea	894.08
45. 220 volt 50 H Ballast installed in above fixture - 4 ea	705.92
Freight	155.65
46. 430 Tork Emerg Light - 2 ea	270.00
47. 796 Greenlee cable lender	131.00
48. MCM XLP copper cable - 4,000	11,253.00
49. 500 MCM B1 copper cable - 1,000	2,813.25
50. Model Super Heavy Duty IMCO 3 pt blade	800.00
51. S29N1103M Transformers @ 180 ea	540.00
52. Electric control panel	318.50
Freight	133.65
53. Commando Rotary Brush Cutter	1,498.00
54. Cabinets for mobile homes - 4 ea (Yemen receipts)	1,453.74
	<hr/>
Total thru December 1982	\$371,178.54

BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003-0027  
 Telephone (505) 646-3009



OFF CAMPUS EQUIPMENT INVENTORY  
 NMSU/YE-1698-02

1. Floor Crane, 2000 lbs.	\$1,008.53
2. Platform Scale, 2000 lbs.	992.78
3. Bench Grinder	770.27
4. C8500 Roto Power Duster	133.98
5. Mobil home skirting panels	3,247.25
6. Gas Fired Forage	536.59
7. Dadant Mini Melter, complete	183.37
8. Golden Rod Model 12 Livestock Power Sprayer	359.00
9. 200-A Soil Core Sampler	216.00
10. Storage buildings 10 @ \$283.49	2,834.90
11. Roto Power Duster C8500 9 @ \$113.98 plus freight	1,205.82
12. PWB-A 0721-0171-03	248.00
13. Brush Chipper - Tow Model Nasco #28223N (Diadem) Extra blades of hardened chrome 3 @ 74.50	1,940.00 223.50
14. 3W106 Trk Crossover Box-std	174.81
15. 32416 2 ton floor jack	343.30
16. Transcriber/recorder Lanier #155-1000 Lanier Business Vo 81793 4/6/82	234.40
17. Shermaster Sheep NASCO WEST Vo 50423 5/28/82	123.90
18. 1 SS Wash rinse sink w/legs NASCO WEST Vo 88399 6/1/82	165.00
19. Model A-DF-SP Solar Pak Fence Charger 2 ea @ 119.95 STOCKMANS NATL SUPPLY Vo 88400 6/1/82	239.90
20. 3 inch Fire Number Brander Set (3/8 inch Face) set of 9 STOCKMANS NATL SUPPLY Vo 88400 6/1/82	119.95
 	<hr/>
Total OFF-Campus Equipment purchased thru 6/30/82	\$15,301.25

OFF-CAMPUS OFFICE EQUIPMENT (1-4-22720-806)

1. Desks (2)	704.84
2. Chairs (2)	308.38
3. Minolta Copier 310 Ser 25101305	3,595.50
4. AB Dick duplicator s/n 737726	394.20
5. Projector	283.50
	<hr/>
Total thru December 1982	\$5,286.42

BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003-0027  
 Telephone (505) 646-2432



OFF-CAMPUS EQUIPMENT  
 NMSU/YE-1698 Ibb (Third Work Plan) 1-4-22723

- |     |   |  |           |
|-----|---|--|-----------|
| 1.  | Shaft assemblies for water pumps 6 @ \$128 ea       |  | \$ 768.00 |
|     | COLE DRILLING CO. Vo 90483 6/9/82                   |  |           |
| 2.  | 3988515 R & P )                                     |  | 227.81    |
|     |   | WALLACE CHEVROLET                                |           |
| 3.  | 1397647 Kit )                                       | Vo 61227   | 108.75    |
|     |   | 9/7/82   |           |
| 4.  | 7826670 Shaft )                                     |  | 253.00    |
| 5.  | Portable Electric Milker )                          | CROUCH SUPPLY CO., INC.                          | 2,039.40  |
| 6.  | Portable Vac Pump Assy )                            | Vo 14861 10/12/82                                | 1,084.50  |
| 7.  | 528085R91 Link )                                    | SIERRA INTERNATIONAL, INC.                       | 266.59    |
| 8.  | Universal Drive Line )                              | Vo. 14133 10/11/82                               | 258.66    |
| 9.  | Mini-reader #14748                                  | KANTRONICS, INC. Vo. 18703 10/26/82              | 272.45    |
| 10. | Air cooled engine 8HP Model-K181T )                 | AIR COOLED ENGINE                                |           |
|     | Air cooled engine 12HP Model-K301S )                | Vo 18711 10/26/82                                | 942.08    |
| 11. | Copyette 1 & 2 (TELEX)                              | PHOTO & SOUND CO. Vo 25971 10/18/82              | 867.67    |
| 12. | Electronic Trainer                                  | HEATH CO. Vo 19055 10/27/82                      | 149.95    |
| 13. | 63" Brass Probe )                                   | SEEDBURO EQUIPMENT CO.                           | 204.00    |
| 14. | Avoir Triple Beam Scale )                           |  | 114.75    |
| 15. | Deluxe Germinator 220V )                            |  | 395.00    |
|     |   | Vo 69857   |           |
| 16. | 10 P set #10 Prec Sieves W/F 2 @ \$120.50 )         |  | 241.00    |
| 17. | Delmhorst Moisture Detector w/56E Electrode )       | 11/4/82  | 245.00    |
| 18. | A. B. Dick Model 592 Stencil Maker                  | BUSINESS PRODUCTS CENTER, INC. Vo 73648 11/22/82 | 1,625.91  |
| 19. | Clipper Office Tester w/V-Belt Guards & six screens | SEEDBURO EQUIPMENT CO. Vo 71616 11/11/82         | 925.00    |

20.	Brinley Cult Model CC2150 )	SIERRA INTERNATIONAL, INC.	525.00
21.	Cole Planters 7309A 2 ea )		620.00
22.	2000RPM Cat O Three Point Hitch )		785.00
23.	48 Mower w/540 Pto )	Vo 25242	575.00
24.	#2 Model PP120Q Plow 12" Cat O )	12/21/82	356.00
25.	Planter unit can for Cole Planter )		125.00
		SIERRA INTERNATIONAL, INC.	
26.	3pt Hitch Cole Planter )		121.00
		Vo 82573	
27.	1 Set guage wheels )		174.00
28.	Fertilizer unit can )	1/10/83	116.00
29.	Table Saw Model#3008-220V 1 phase 10 inch tilting arbor		1,877.32
		MCMMASTER-CARR SUPPLY CO.	
30.	10 inch Radial Arm Saw without stand )	Vo 85905	624.70
	Less discount )	1/20/83	(50.04)
31.	Tractor 18 HP Power King Model 2418	ENGINEERING PRODUCTS CO.	
	Vo 85906 1/20/83		3,675.00
32.	225 Arc Welders 3 @ \$162 )	HAYDEN'S HARDWARE CENTER	486.00
33.	Pressure Cooker )	Vo 85907	119.25
34.	Pressure Cooker )	1/20/83	109.19
	Less Discount		(22.94)
35.	Auto part 14031989 14006153	WALLACE CHEVROLET Vo 83848	
	1/14/83		126.68
36.	Schlueter pasteurizer P3000	BROADWAY APPLIANCE Vo 85883	
	1/20/83		110.00
37.	Kitchenaid mixer K45SS	BROADWAY APPLIANCE Vo 85885 1/20/83	189.90
38.	Coats Tire Change )	RANGS AUTO & TRUCK, INC.	331.00
39.	Bada Balancer )	Vo 87799 1/27/83	249.00
40.	6 shelf open unit	MCMMASTER-CARR Vo 81986 1/6/83	1,469.75
41.	International Model 530 Manure Spreader Serial No.		
	C006773 MORRISONS, INC. Vo 82527 1/10/83		3,498.00

42.	Silent Filmstrip Projectors 2 ea	JEAN & TROX SUPPLY	
	Vo 81215	1/4/82	414.12
43.	A.B. Dick Mimeograph Model 555 S/N 20106	BUSINESS PRODUCTS CENTER, INC.	1,778.66
	Vo 27184	2/7/83	
44.	Repair parts for International 464 tractor:		
	Pressure Plate 2 @ 99.79		199.58
	Clutch Disc 2 @ 126.08		252.16
	T.O. Brg. 2 @ \$14.25		28.50
	Kit	SIERRA INTERNATIONAL, INC.	8.45
	Valve	Vo 27256	3.65
	Freight	2/17/83	6.10
45.	Communications Receiver IC-R70	ELECTRONIC EQUIPMENT BANK	
	Vo 28903	2/15/83	705.50
46.	Loader frame )	SIERRA INTERNATIONAL, INC.	995.00
47.	Loader Repair Kit )	Vo 29604	495.00
48.	5' Material Bucket )	2/15/83	405.00
49.	Kerosene Heater Serial 28296	HAYDEN'S HARDWARE CENTER	
	Vo 29959	2/16/83	233.95
50.	Winches #4Z327 2 @ \$252.62 )	MCMaster-CARR SUPPLY CO.	505.24
51.	Gasoline Powered High Pressure Washer )	Vo 30418	2,681.67
	Discount	2/17/83	(63.74)
52.	Spirit Duplicator Model 212 Serial 822359 )		530.70
		A.B.DICK PRODUCTS CO. Vo 31618	
53.	Transparency Maker Model 204 Serial 011622 )	2/23/83	464.28
54.	Projector 2 @ \$297.20	TROXELL COMM., INC.	394.40
	Freight	Vo 30937 2/21/83	2.10
55.	#64 PTO Pump Kit )	SIERRA INTERNATIONAL	440.00
56.	#19981 3 spool Valve )		365.00
57.	Hyd Hvy duty Hose Pkg & adpt pkg )	Vo 27307	300.00
58.	Extra Set Adpt pkg )		100.00
59.	111200A 2 1/2 cyl @ 235 )		470.00
60.	111200B 2 1/2 cyl @ 235 )	2/7/83	470.00

61.	Maxim oven #3 BROADWAY APPLIANCE Vo 32517 2/28/83	210.00
62.	Tents 3 @ \$149.99 SEARS Vo 90124 3/7/83	449.97
63.	Rokon Att, Ranger Model, Serial R83-106 ) ROKON LTD.	3,025.45
64.	Plow, Mold Based )	175.95
65.	3-Point Hitch ) Vo 90327	199.75
66.	Dump Trailer )	118.15
67.	Double Gang Disc Harrow ) Shipping & Handling ) 3/8/83	248.20 162.45
68.	Video cassette recorder, video tuner, color video camera, 19" monitor, cabinet for storage CURTIS MATHES Vo 92827 3/16/83	3,061.54
69.	Skill Drills 2 ea ) HAYDEN'S HARDWARE CENTER	244.33
70.	3/8 Click type Torque Wrench )	135.08
71.	1/2 Click type Torque Wrench ) Discount ) Vo 93349	154.87 (29.00)
72.	7 1/4 Circular Saw )	147.60
73.	Devibliss Spray Gun ) 3/21/83	251.37
74.	Blacksmith anvil HOUSE & SON WELDING Vo 94598 3/24/83	100.00
75.	Storage building SEARS ROEBUCK & CO. Vo 94578 3/24/83	209.00
76.	New Holland Model 707 Forage Harvester, s/n 468765 w/attachments	5,200.00
77.	8 panel basic unit - Outline 2 @ \$870 ) SKYLINE DISPLAYS, INC.	1,740.00
78.	Unit case-Hardcover 2 @ \$225 ) Vo 37016 4/20/83	450.00
79.	Grainger Parts Cleaner ) HAYDENS HARDWARE CENTER	640.93
80.	Live Animal traps 2 ea ) Vo 37017	292.09
81.	Cordless Screwguns 3 ea )	372.60

82. Fuel Meter 4 ea )	4/20/83 .	396.00
83. A210 Maytag Washers 9 ea BROADWAY APPLIANCE Vo 38274	4/26	4,390.39
84. SS Wash Rinse sink w/legs NASCO WEST, INC. Vo 96845	5/3/83	253.33
85. Forage Moisture Tester DICKEY-JOHN Vo 98973	5/12/83	296.68
86. Anvil Case for Curtis Mathis recorder, camera & tuner BLACKS COMMUNICATION Vo 98979	5/12/83	292.25
87. Brunton Compass F2001-Quads s/n 161242 HOLMANS, INC. Vo 100472	5/17/83	134.01
88. C-150 )	TELEX COMMUNICATIONS, INC.	796.00
89. Ext. Cables 2 @ \$104.72 ) Less discount )	Vo 97905 5/9/83	209.44 (10.06)
90. Fou-Matic Milking unit, complete STEELCON BUILDING CO. Vo 40350	6/8/83	250.00
91. 12.volt winch 3 @ 294.57 HAYDEES HARDWARE Vo 41084	6/9/83	883.71
92. KK520 Planter Brinley )	SIERRA INTERNATIONAL	360.00
93. BB560 Rear Blade Brinley )		150.00
94. BE363 Fork lift Kit Brinley )	Vo 42447	101.00
95. EB484 Lawn & Garden Roller Brinley )		220.00
96. SS500 Harrow Brinley )	6/16/83	135.00
97. Post hole Digger Model 25-2500 )	SIERRA INTERNATIONAL	665.00
98. Auger for Post hold Digger 6" model 23161 )	Vo43763 6/22	120.00
99. Maytag washer A210 BROADWAY APPLIANCE Vo 43768	6/22/83	532.38
100. DW 8300 Transit Level SN227403 )	HOLMANS, INC.	449.10
101. Lietz 7533-75 Tripod )	Vo 45688	117.00
102. Lietz 3651-30 Planimeter )	6/29/83	166.50
103. Schlueter cream separator EL-1 BROADWAY APPLIANCE		

Vo 45691 6/29/83		540.00
104. Beseler Opaque Project VU-Lyte III BROADWAY APPLIANCE Vo 45694 6/29/83		741.60
105. Schlueter automatic elect, pasteurizer P3000 BROADWAY APPLIANCE Vo 45697 6/29/83		129.00
106. Tape duplicator DU MOTION Vo 46004 6/30/83		990.00
107. 21-3365 Header J.C.WHITNEY & CO. Vo 47018 7/7/83		116.96
108. Model 671 digital pH meter w/1085 pH electrode, buffer solution electrode stand and 220 VAC adapter KERNCO INSTRUMENTS Vo 47334 7/11/83		355.00
109. Lietz 115 Transit sn 16907 ) HOLMANS, INC. Vo 47366		715.50
110. Lietz 7533-75 Tripod ) 7/11/83		117.00
111. SP 400 Super Pan Loader Cat 1 3 pt Hitch ) SIERRA INTERNATIONAL		654.00
112. 23168 All star 12" Auger ) Vo 47367		150.00
113. 23165 All star 9' Auger) 7/11/83		125.00
114. 1 ea Smalley 100 PH Hammer Mill 10", Bagger Syclone support 1 ea Set of nine screens 1 ea Smalley 100 GD PTO Drive 1 ea Smalley 100T Transport 15" Wheels & New Tires 1 ea Smalley 100M Magnet 10 ea Smalley YJ1005 Hammer Pins 2 ea Smalley 1 3/4 Bearing Sets 60 Smalley 5006 Extra Hammers 2 ea Parts & Service manuals for 10" Mill MORRISONS, INC. Vo 47667 7/11/83		3,079.00
115. BB 2036 Box Scraper ) SIERRA INTERNATIONAL Vo 47682		477.00
116. BB 335 Shank Kit ) 7/11/83		108.00
117. Chisel Punch Set ) HAYDENS HARDWARE		157.32
118. Power Hoe 1 @ 249.95 ) Vo 106396		499.90
119. Post Hole Digger ) 7/21/83		384.58
120. FI-50 pickup fuel & tool boxes 2 @ \$315		

	J&J MUFFLER SHOP Vo 105023 7/18/83	630.00
121.	3M AKD Serial #1543883 Projector BUSINESS MACHINES Vo 106072 7/20/83	733.00
122.	Bou-Matic Milk Receiver Model RP-75 ) STEELCON BLDG. CO.	985.00
123.	7E2 Butler Brain Storage Bin ) Vo 106080	977.00
124.	Poultry Cages, complete w/watering, feeding, and egg tray systems ) 7/20/83	450.00
125.	8513923 Master Control panel STEELCON BLDG. CO. Vo 106437 7/21/83	906.57
126.	Tap & die set HAYDENS HARDWARE Vo 106396 7/21/83	430.09
127.	Model 750 H Hand Refractometer 3 @ \$300 ) KERNCO INSTRU. Less discount (90.00) Add shipping & handling 7/18/83 10.52	900.00
128.	Tool Box MB900 ) HAYDENS HARDWARE	503.25
129.	Tool Box BM512 ) Vo 206396 7/21/83	420.14
130.	Modern 6' Commando Shreader ) SIERRA INTERNATIONAL, Inc.	1,126.80
131.	Herd I-92 Seeder/Broad Caster ) Vo 49598 8/3/83	350.00
132.	AP-374 Handi-Man Head Gate w/table C. H. DANA CO. INC. Vo 49597 8/3/83	407.00
133.	Loading Auger Assembly STEELCON BLDG. CO. Vo 49604 8/3/83	950.00
134.	Maytag Electric Dryer DE308 BROADWAY APPLIANCE Vo 49572 8/3/83	369.00
135.	7E2 Butler Grain Storage Bin STEELCON BLDG. CO. Vo 49570 8/3/83	977.00
136.	Portable Carriage Assembly for Feed Handling System Clutch PTO Shaft, Outlay & tires STEELCON BLDG. CO. Vo 49564 8/3/83	877.45
137.	Cole Sub Soiler #60-690 and Cole Sub Soiler wear plate #60-690 SIERRA INTERNATIONAL Vo 50235 8/4/83	440.00
138.	Model DD1650n Disc Harrow Brinley SIERRA INTERNATIONAL	

	Vo 50179 8/4/83	842.00
139.	Completion Kit for Grain Storage Tank incl. Auger, Ladder and Hopper Bottom 2 @ \$475 STEELCON BLDG. Vo 50764 8/8/83	950.00
140.	PH-1000 Pick-Um-Up Hoist T&R MARINE CORP. Vo 60757 8/25/83	775.00
141.	Model 60/70 B&S Refractometer, R.I. 1.300 and 1.700 Brix 0-95% w/protected thermometer, electric 220v/50hz KERNCO INSTRUMENTS CO. Vo 61898 8/30/83	2,150.00
142.	Brinley FF200 Broadcaster )SIERRA INTERNATIONAL Vo 62268	295.00
143.	Brinley DD1660N Disc Harrow CC2152 DD1653 ) 9/1/83	435.00
144.	Model K8 Tuff-Bilt graden tractor and accessories TUFF-BILT Vo 109622 9/8/83	7,810.66
145.	International 982 Hydro Cadet Tractor 144986399 Engine No. K803554412 ) MORRISON'S, INC.	4,914.00
146.	International No. 48 Rotary Tiller 193-356-100 ) Vo. 109248	944.00
147.	Haban 444-D Sickle Bar Mower 20-22 #273191 ) 9/8/83	1,053.00
148.	3W264 Tool cabinet ) HAYDEN'S HARDWARE CENTER	963.00
149.	ET960 Dual Meter ) Vo 108354 9/6/83	292.60
150.	3M 213 Overhead Projectors 4 @ \$524 CMI Vo 114281 9/26	2,096.00
151.	Somso Cow #56-5800 CAROLINA BIOLOGICAL Vo 114299 9/26	1,844.34
152.	Victor 9000, Model 9121 # CO044767 ) COMPUTER CENTRAL	2,995.00
153.	Victor 136-column dot matrix printer model 6020 SN# 513794 ) Vo 114286	895.00
154.	Supercalc #7185 SN#3180 )	265.50
155.	Wordstar w/Spellstar #7172 SN#7016RK/6001N3 )	715.00
156.	T.I.M. III (Total Infoformation Management System) SN#3448-06-3-30 )9/26/83	445.00
157.	Kroy 80 Electric KROY INDUSTRIES Vo 65731 10/12/83	695.00

158.	MB570 Tool Box )	HAYDEN'S HARDWARE CENTER	404.63
159.	Trade Tool Box 2 @ \$285.27 )	Vo65941	570.54
160.	Portable Alternator )	10/12/83	384.24
161.	54" Dozer Blade for Int'l 982 Cadet Tractor MORRISONS, INC. Vo 68736 10/25/83		351.00
162.	WESTGO Model 4010 Rock Picker - complete 10/25/83	WESTGO Vo 68781	1,750.00
163.	KW Front End Loader Model 450-2510 K & W Vo 68780 10/25/83	SIERRA INT'L	1,485.00
164.	Vertical Horizontal Band Saw Vanguard #SX12 HARDWARE Vo 69851 10/31/83	HAYDEN'S	2,272.00
Total equipment purchases thru 10/30/83			<u>\$128,121.48</u>

BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003-0027 ON-CAMPUS EQUIPMENT  
Telephone (505) 646-2432 NMSU/YE-1698 (Third Work Plan) 1-4-22724



1. 24K TRS-80 Model 100 portable computer

\$799.20 NMSU

BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003 -0027  
Telephone (505) 646-2432



OFF-CAMPUS EQUIPMENT  
NMSU/YE-1698 Ibb (Fourth Work Plan) 1-4-22731

1. Sharp all #1055 HAYDEN's HARDWARE Vo 122537 11/28/83 \$ 892.00
2. Hester Plow w/2 ea 26" Blades Model H-280 SN 0631  
SIERRA INTERNATIONAL Vo 121351 11/21/83 1,299.00
3. KMG 38 Sickle Bar Mower KINCO MFG. Vo 121072 11/21/83 684.00
3. 40" Loader Bucket SIERRA INTL., INC. Vo 116970 11/3/83 515.00
4. 8519985 Vac. Pump Supplier FR3 STEELCON BLDG. Vo 73318  
12/14/83 1,495.00
- 5.. Garver #556 Babcock Milk Fat 24 Bottle Determining Tester  
220/50 )BROADWAY APPLIANCE 675.00
6. #240 (24 Bottle) Garver Test Shaker w/transformer 220/50 495.00  
Vo 74874 12/20/83
7. 16D+ Cond Meter w/Dip cell MARKSON SCIENCE Vo 130109 1/9/84 380.00
8. 1096D+ Digital Cond Meter w/Dip ) MARKSON SCIENCE 567.28
- 9.. 1689+ Flat Surface PH Meter ) Vo 131196 1/12/84 261.12
10. 3M Transparency Maker #4500 CMI/3M Vo 131279 1/12/84 840.00
11. Full size Maxi-pedic Deluxe Box Spring & Mattress w/364  
Coil-Built in Bed Board 9 sets Simmons )CHARLOTTE'S 2,070.00
12. Lounge Chairs 9 ea @ \$332. ) Vo 131584 2,988.00
13. Simmons Sofa Sleepers 9 ea @ \$412 ) 1/16/84 3,708.00
14. Food Replica Pkg 1&2&3 NASCO WEST, INC. Vo 132283 1/17/84 328.50
15. Wall-saver Recliner chairs #16 med. brown 9 @ \$384  
CHARLOTTE'S Vo 77172 2/6/84 3,456.00
16. Pickwick Hom-Pik Drum Picker ) BROADWAY APPLIANCE 355.00

17.	Motor Assembly M-13 )	Vo 77170	136.00
18.	Electric Scaldler HS(P) )	2/6/84	548.00
19.	Spectrophotometer Spectro 21	VWR SCIENT. Vo 81104 2/21	2,638.00
20.	12 MX Cole Unit 2 ea	SIERRA INTERNATIONAL Vo 82839 2/28/84	820.00
21.	3600 Dome Lid Vita Mix w/Spigot 220 volt	VITA MIX CORP. Vo 82415 2/27/84	339.95
22.	Herbarium Cabinet Gray Finish Right Hand Door	LANE SCIENCE EQUIPMENT Vo. 82409 2/27/84	585.00
23.	100 Litre Cheese Making Vat 220v/50Hz	BROADWAY APPLIANCE Vo 90023 4/26/84	3,395.00
24.	Auto Pod V	HAYDENS HARDWARE Vo 150762 5/24/84	384.00
25.	Student Recordkeeping (IMS) for Victor 9000	COMPUTER CENTRAL Vo 150520 5/24/84	850.00
26.	Kelley Hyd Control Unit for 464 IH Tractor	SIERRA INT'L Vo 93425 6/12/84	1,350.00
27.	Bucket Stabilizer Arms & Accessory EQ for Front End	Loader SIERRA INTERNATIONAL Vo 97977 6/28/84	1,125.75
28.	Video Cassette Recorder, Model JV 729	BOWMANS CURTIS MATHES Vo 2513 8/1/84	599.00
29.	Fluid Duplicator SN 823974	AB DICK PRODUCTS Vo 13122 8/27	515.27
30.	Seal 173A Dry Mount Press/220V )	PHOTO & SOUND CO.	700.00
31.	Bogen PM-16S Megaphone )	Vo 13959 8/29/84	247.80
32.	DCX III Combination Serial 388812 )	DICTAPHONE	699.60
33.	DCX III Dictator 2 @ \$725 )	Vo 13963	1,450.00
34.	DCX III Combination Serial 388811 )		795.00
	Less Discount )	8/29/84	(269.40)
35.	3M Lettering System 220v/50Hz 7402ADAS	BROADWAY APPLIANCE Vo. 106605 9/19/84	627.40
36.	Beseler Solid State Enlarger - Color Head	Dichro 6765k(67CP2) )	570.00
		BROADWAY APPLIANCE	
37.	Color Analyzer 8154(PM1A) )	-	399.00

Vo 16852

38. 2 each Kodak Ektagraphic Slide Projectors  
Zoom lens 220v/50Hz AV310 ZAR7 B2AR ) 10/8/84 898.00

39. Classroom Projector Model 213 INTERNATIONAL OPERATIONS/3M  
Vo. 112651 11/13/84 469.42

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Total 4th Work Plan Equipment thru 11/30/84 \$40,881.69

BUSINESS OFFICE

Collection Department  
Box 3AA/Las Cruces, New Mexico 88003-0027  
Telephone (505) 646-4242



OFF-CAMPUS EQUIPMENT  
NMSU/YE-1698 Ibb (Fifth Work Plan) 1-4-22742

1. 5 HP Roto Tiller Model #214-381033 2 each HAYDENS HARDWARE  
P. O. 7425 Vo 130229 1/28/85 \$ 702.00
2. Sunkist Commercial Juicer 220/50 8-5855 BROADWAY APPLIANCE  
P. O. 7016 Vo 32859 2/18/85 425.00
3. Telex Caramate 220v/50Hz BROADWAY APPLIANCE P. O. 5410  
Vo. 34143 2/20/85 750.00
4. Parts Washer 240v HAYDENS HARDWARE P. O. 8424 Vo 34544  
2/21/85 435.00
5. #2204 Four Stroke Engine(TS) #185164 )BROADHEAD-GARRETT 295.00  
P. O. 8509
6. #2208 4 Stroke Diesel #411309 ) Vo 133235 3/11/85 365.00
7. 14 Ft. Platform Bed SIERRA INTERNATIONAL P. O. 8625  
Vo. 133237 3/11/85 950.00
8. John Deere 1075 Wagon Gear, less bolsters, stakes, wheels  
and tires ROMNEY EQUIPMENT P. O. 8677 Vo 133236 3/11/85 950.00
9. Scissor type hoist AIRE HYDRAULICS CO. P. O. 8680  
Voucher 136416 3/21/85 956.00
10. Model 188 Water Bath VWR SCIENTIFIC P. O. 7365  
Vo 137987 3/27/85 852.80
11. Omaha Standard Steel Grain Sides TRUCK DEALERS EQUIP. CO.  
P. O. 8932 Vo 40158 4/11/85 922.00
12. Carrying Case for TV equipment FF 102573-2 THERMODYNE  
INTERNATIONAL P. O. 9483 Vo 43338 4/25/85 336.40
13. TDC/2-20 Steam Kettle 20 qt. ) McCOMAS SALES P. O. 9322 1,075.00
14. FT-20 Steam Kettle 20 gal. ) Vo 139588 5/6/85 1,695.00
15. 10' Bucket SIERRA INTL. P. O. 9497 Vo 139587 5/6/85 471.00
16. H-40 ITE Head AUDIO-VIDEO RECORDERS P. O. 9444  
Vo 141921 5/14/85 270.00

17.	Rigid Tripod #450 HAYDENS HARDWARE P. O. 11917 Vo 144213 5/22/85	388.50
18.	10' WT Adpt for Econo Scraper SIERRA INTERNATIONAL P. O. 9167 Vo 45139 6/3/85	625.00
19.	Dixie No. 3 Retort for steam or water cook & pressure cooling including regular equipment for up to 40 lbs. working pressure, A.S.M.E. Code Stamp and Registration Certificate ) DIXIE CANNER EQUIPMENT CO.	6,200.00
20.	Cooling Water inlet valves & spray nozzles assembly for retort cover, w/4' hose and bibb for water line connection ) P. O. 9321 Vo 49062	285.00
21.	Dixie Model 23-500 Electric Sealer set to close 300 X 407 cans complete w/regular equipment except w/special 1/3 HP, 110/220, 50HZ, 1-phase motor ) 6/19/85	1,087.50
22.	Thermofax Secretary Model 25 CANON CO. paid in Yemen YR6,000.00 @ 7.3 exchange 4/16/85 - MJE 6007 receipts	821.92
23.	Rebuilt Crimping Machine and couplings SIERRA INT'L Vo 59966 7/29/85	480.33
24.	K-60 Drain Auger HAYDENS HARDWARE Vo 105612 8/21/85	714.00
25.	Field Microscope NASCO WEST, INC. Vo 116648 10/24/85	285.00
26.	Nitrogen Freezer NASCO WEST, INC. Vo112204 10/10/85	659.79
27.	IH50 C Mower Attachment s/n U217659 SIERRA INTERNATIONAL Vo 115502 10/22/85	717.00
	Total 5th Work Plan Equipment thru 10/30/85	<u>\$23,714.24</u>

BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003-0027  
Telephone (505) 646-2432



OFF-CAMPUS EQUIPMENT

NMSU/YE-1698 Ibb (Sixth Work Plan) 1-4-22759-800 (under \$500

VWR SCIENTIFIC P. O. 5506

1.	Drur Base Cabinet 18x35-3/4x22E position 1 & 2	325.97
2.	Sink base cabinet 48x35-3/4x22E "	332.47
3.	Corner base cabinet 32x35-3/4x32E "	329.87
4.	Kmrnsn Diag Crnr wrk TCP 33x33E "	276.62
5.	CPBRD base cabinet 36x35-3/4x22E "	310.39
6.	CPBRD/drwr bas cab " "	381.82
7.	Drwr base cabinet 24x35-3/4x22E position 3 & 4	279.22
8.	Cpbrd/Drwr bas Cab 48x35-3/4x22E "	371.43
9.	Cpbrd base cabinet 36x35-3/4x22E "	316.88
10.	Corner base cabnt 32x35-3/4x22E "	329.87
11.	Kmrnsn diag crnr wrk tcp 33 x 33E "	276.62
12.	Sink base cabinet 48x35-3/4x22E "	332.47
13.	Drwr base cabinet 24x35-3/4x22E "	279.22
14.	Cpbrd base cabinet 48x35-3/4x22E Position 5	316.88
15.	Cpbrd/drwr bas cab 48x35-3/4x22E "	441.56
16.	Sink base cabinet " "	332.47
17.	Cpbrd base cabinet 36x35-3/4x22E "	310.39
18.	Cpbrd/drwr bas cab " "	381.82
19.	Drur base cabinet 18x35-3/4x22E "	325.97
20.	Sink base cabinet 48x35-3/4x22E "	332.47
21.	Cpbrd Base Cabinet 36x35-3/4x22E "	310.39
22.	Drur Base cabinet 18x35-3/4x22E Position 6	651.94
23.	Cpbrd base cabinet 36x35-3/4x22E "	620.78
24.	Sink base cabinet 48x35-3/4x22E "	664.94
25.	Cpbrd/Drwr bas cab 36x35-3/4x22E "	763.64
26.	Cpbrd Base cabinet 48x35-3/4x22E Position 7	316.88
27.	Cpbrd Base cabinet 36x35-3/4x22E "	310.39
28.	Cpbrd/Drwr bas cab 36x35-3/4x22E Position 8	381.82
29.	Open F/H Stor case 48x84x16E "	418.95
30.	Cpbrd/Drwr bas cab 24x35-3/4x22E Position 9	255.84
31.	Sink base cabinet 48x35-3/4x22E "	332.47
32.	Cpbrd base cabinet 36x35-3/4x22E "	310.39
33.	Drawer Base cabinet " "	403.90
34.	Sink base cabinet 48x35-3/4x22E "	332.47
35.	Cpbrd/Drwr bas cab 36x35-3/4x22E "	357.14
36.	Cpbrd Base Cabinet " "	310.39
37.	Sink base cabinet 48x35-3/4x22E "	332.47
38.	Cpbrd Base Cabinet 36x35-3/4x22E Position 10	310.39
39.	Drur Base Cabinet 18x35-3/4x22E "	325.97

40.	Drawer base cab	"	"		255.84
41.	Open F/H Stor case 36x84x16E		"		340.00
				VOUCHER 120406 12/9/85	
42.	2 ea Sheep Shearing Machines HORSE & HOUND FEED SUPPLY				542.89
	P. O. 6520 Vo 78475 1/8/86				
43.	CPBRD/DRWR Bas cab 36x35-3/4x22E	)	VWR SCIENTIFIC		357.14
			P. O. 5715 & 5506		
44.	9 each Double Bowl Sink @ \$305.00	)	Vo 85259 1/30/86		2,745.00
45.	Drawer Base Cabnt. 36x35-3/4x22E Position 9	)	VWR SCIENTIF.		403.90
			P. O. 5506		
46.	Wallcase w/hngd doors 48x30x12E Position 6	2 ea @ 292.21	)		584.42
			Vo 127781		
47.	Wallcase w/hngd doors 48x30x12E Position 9	4 ea @ 292.21	)		1,168.84
			2/12/86		
48.	Westinghouse Stack Dryer BROADWAY APPLIANCE	P. O. 3703			400.00
	Vo 130452 2/19/86				
49.	Wallcase, w/hngd doors 36x30x12 position 1 & 2				
	4 each @ \$275.32	)	VWR SCIENTIFIC		1,101.28
50.	Wallcase, w/hngd doors	"	"	3 & 4	
	2 each @ \$275.32	)			550.64
51.	Wallcase, w/hngd doors	"	"	5	
	4 each @ \$275.32	)			1,101.28
			P. O. 5506		
52.	Wallcase, w/hngd doors	"	"	6	
	2 each @ \$275.32	)			550.64
			Vo 89506		
53.	Wallcase, w/hngd doors	"	"	10	
	2 each @ \$275.32	)		3/17/86	550.64
54.	Time Clock #4056 OFFICE CONCEPTS, INC.	P. O. 3567			
	Vo 156238 9/11/86				335.00
55.	Frigidaire Range FRE440SM25L 3 ea @\$445 WHITE-WESTINGHOUSE				
	P. O. 7973 Vo 155197 9/8/86				1,335.00
56.	Super-Aircomaster I VALLEY WELDERS	P.O.4023	Vo 111326	10/1	395.00
57.	VFS-2116-01 Open F/H Stor Case	VWR SCIENTIFIC	P. O. 5506		
	Vo 117838 10/27/86				340.00
58.	Image Writer II	)	COMPUTERLAND OF LAS CRUCES		499.00
			P. O. 5641		
59.	Personal Modem 3/12	)	Vo 161416	11/4/86	299.00



BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003-0027  
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OFF-CAMPUS EQUIPMENT

NMSU/YE-1698 Ibb (Sixth Work Plan) 1-4-22759-806 (over \$500)

1.	Scanopreg for sheep NASCO WEST P. O. 4125 Vo 71997 11/7/85	\$ 649.58
2.	#13007-279 Cement Mixer FARM & FAMILY CTR P. O. 6728 Vo 123631 12/17/85	753.53
3.	Kelver Training Cow) NASCO WEST, INC. P. O. 4772	3,635.00
4.	Universal Trainer ) Vo 78016 1/7/86	1,758.00
5.	1986 GMC Sierra-700 Truck Vehic ID 1GDP7D1Y5GV513453 SISBARRO BUICK-PONTIAC P. O. 5175 Vo 83617 1/27/86	30,798.00
6.	Blue Side Band Fertilizer Dist. SIERRA INTL. P. O. 6598 Vo 81120 1/16/86	1,375.00
7.	Offset Disc Monroe Tufliner SR 269 SIERRA INTL. P. O. 6879 Vo 82520 1/21/86	3,350.00
8.	Sickle Bar Mower Serial 58K1080B KINKO MFG. P. O. 6020 Vo 129397 2/17/86	877.80
9.	2 each Maytag Dishwashers - Almond WU302 BROADWAY APPLIANCE P. O. 8343 Vo 92287 3/26/86	1,218.76
10.	Refrigerator (Nitrogen) NM Steel Co. P. O. 8173 Vo 136326 4/10/86	586.00
11.	WV302 Maytag Dishwasher (Almond) )BROADWAY APPLIANCE	545.00
12.	DE50 Maytag Electric Porta Dryer 220/50 2 @ \$550 ) P. O. 7327 & 8343 Vo. 139724 4/23/86	1,100.00
13.	ZF-158-42 256K Dual Disk 8MHZ ZENITH DATA SYSTEMS P. O. 738 Vo 111023 8/28/86	999.00
14.	Frigidaire Refrigerator FPR1524VNL w/ice maker kit 3 each WHITE-WESTINGHOUSE INTERNATIONAL P. O. 7973 Vo 155197 9/8/86	2,403.00
15.	APPL-A745D Macintosh Plus Computer COMPUTERLAND P. O. 5642 Vo 161416 11/4/86	2,199.00
	Total Equipment purchased thru 11/30/86	<u>\$52,247.67</u>

BUSINESS AFFAIRS

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OFF-CAMPUS EQUIPMENT

NMSU/YE-1698 Ibb (Seventh Work Plan) 1-4-22725-806 (Over \$500)

1. Mac 20 MB HD ENH COMPUTERLAND OF LAS CRUCES P. O. 5391 Vo 161493 11/4/86	\$ 950.00
<b>Total Equipment purchased thru 11/30/86</b>	<b>\$ 950.00</b>

BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003-0027  
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OFF-CAMPUS EQUIPMENT

NMSU/YE-1698 Ibb (Seventh Work Plan) 1-4-22759-800 (Under \$500)

1. SK920 Scaperlett SIERRA INTERNATIONAL P. O. 3323 Vo 165169 11/17/86	275.00
2. La-Mkella binding machine OFFICE CONCEPTS, INC. P. O. 5395 Vo 163833 11/11/86	271.66
<b>Total Equipment purchased thru 11/30/86</b>	<b>\$ 546.66</b>

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BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003-0027  
Telephone (505) 646-2432



OFF-CAMPUS EQUIPMENT NMSU-YE-1698 Ibb  
(Seventh Work Plan) 1-4-22726-806 (Over \$500)

1. Mac 20 MB HD CNH COMPUTERLAND OF LAS CRUCES  
P. O. 5391 Vo 161493 11/4/86 \$950.00
2. Liquid Nitrogen Freezer w/o Canister NEW MEXICO STEEL  
P. O. 5259 Vo 11920 12/2/86 586.00
3. OMR Test Scorer Machine Serial K-12133 SCANTRON  
P. O. V6248 Vo 126936 2/5/87 1,695.00
4. IH 1190.7' Mower Conditioner SN U603362 SIERRA INT'L  
P. O. 7393 Vo 176283 3/4/87 6,625.00
5. Laboratory table, stainless steel top (std size table  
8'x3'x6"x3'H) adj 3/4" up/down 4 ea )  
STAINLESS STEEL FABRICATORS, INC. 2,380.00
6. Laboratory table, stainless steel top center draining  
hole and pipe, 4 casters that swivel 8'x3'x6"x3'H 2ea )  
P. O. 006610 Vo 122427 1,250.00
7. Shelf stands, rust/acid proof, heavy metal, adj. shelve  
unit (10 shelves) 5'x1'6"x10'H shelves 16ga stainless  
steel 6 ea ) - 12/15/86 5,370.00
8. Model CQ8 Lindig Multi-Purpose shredder clipper 2 ea  
ROMNEY EQUIPMENT P. O. V07085 Vo 135782 4/14/87 2,231.00
9. Two-Row Lilliton Cultivator CLARKS TRACTOR P.O. V07599  
Vo 136679 4/20/87 2,180.00
10. Hay Baler - Case-IH 428 Twine Baler Serial U001017  
SIERRA INTERNATIONAL P. O. V08746 Vo 138658 4/27/87 6,249.00
11. Model #18 Laboratory Pulper/Finisher Serial L-372  
F. H. LANGSENKAMP CO. P. O. V07560 Vo 184431 5/6/87 8,689.00
12. Mac SE Personal Computer s/n F713BAG COMPUTERWORKS OF  
LAS CRUCES P. O. V10621 Vo 152211 7/15/87 1,995.00
13. Magnavox Escort Camera s/n 41900865 DILLARDS P. O.  
V10153 Vo 144543 6/15/87 1,095.00
14. Heavy Duty Squeeze Chute #Z5631N NASCO WEST P. O.  
V10306 Vo 152522 7/20/87 1,265.00
15. Butler Gain Storage Bin STEELCON BLDG P. O. V10406  
Vo 191045 7/14/87 1,300.00

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16. NAFCO Mechanical Convection Incubator SARGENT-WELCH  
P. O. V07591 Vo 194562 8/4/87

2,010.00

Total Equipment purchased thru 8/30/87

-----  
\$45,870.00

*Appendix 2*

BUSINESS AFFAIRS

Box 3AA/Las Cruces, New Mexico 88003-0027  
Telephone (505) 646-2432



OFF-CAMPUS EQUIPMENT NMSU-YE-1698 Ibb  
(Seventh Work Plan) 1-4-22726-800 (Under \$500)

- 1. SK920 Scraperlett SIERRA INTERNATIONAL P. O. 3323  
Vo 165169 11/17/86 \$275.00
- 2. La-Mkella binding machine OFFICE CONCEPTS, INC. P. O. 5395  
Vo 163833 11/11/86 271.66
- 3. Metal shelf unit 3'6"L, x 1'6"W x 5'H w/four shelves of <sup>16</sup>26 ga  
stainless steel 4 each STAINLESS STEEL FABRICATORS  
P. O. 006610 Vo 122427 12/15/86 1,800.00
- 4. Imagewriter & Modem COMPUTERWORKS OF LAS CRUCES  
P. O. V10621 Vo 152211 7/15/87 718.78
- 5. Personal Modem 3/12 APPL-1031E COMPUTERLAND P. O. V08966  
Vo 142493 6/8/87 299.00
- 6. Transit Level w/Lens Covers & Shield 2 ea Serial Nos.  
7897, 8017 @ \$465 each HOLMANS, INC. P. O. V09676  
Vo 141200 6/2/87 930.00
- 7. Paper System for Butler Storage Bin STEELCON BLDG.  
P. O. V10497 Vo 191045 7/14/87 500.00

Total Equipment purchased thru <sup>7/31</sup>~~6/30~~/87 -----  
\$4,794.44<sup>A</sup>

BUSINESS AFFAIRS, DEPT. 3AA

Box 30001/Las Cruces, New Mexico 88003-0001  
Telephone (505) 646-2432



OFF-CAMPUS EQUIPMENT NMSU-YE-1698 Ibb  
(Eighth Work Plan) 1-4-22735-806 (Over \$500)

File: Yemeni

1. Troy Bilt Rotary Tillers (2 each) GARDEN WAY MFG. P. O. W06461 Vo 215571 12/21/87	\$2,323.50
2. Pro-Gro EL Soil Sterlizer A. E. HUMMERT SEED CO P. O. W06460 Vo 171539 1/13/88	803.00
3. Greenhouse Exhaust Fan #7C216 2 @ 535.74 W. W. GRAINGER P. O. W06457 Vo 169121 1/4/88	1,071.48
4. 1987 Polaris Trail Boss 4x4 Utility vehicle GEARGETOWN CYCLE P. O. W06793 Vo 218011 2/3/88	2,745.00
5. Case/IH 235 Z-Wheel Drive tractor Serial 0017627449 MORRISONS INC. P. O. W07393 Vo 178151 3/7/88	5,810.00
6. Valve Seat Cutter MAC TOOLS P. O. W10835 Vo 009272 7/11/88	635.00
7. Macintosh SE Hard Disk Serial F8351HK ) P. O. X02234	2,575.00
8. Laser Writer Serial C8246FV ) COMPUTERLAND	3,815.00
9. Apple Scanner ) Vo 207834 10/18/88	1,300.00
	-----
Total Equipment purchased thru 10/31/88	\$21,077.98

BUSINESS AFFAIRS, DEPT. 3AA

Box 30001/Las Cruces, New Mexico 88003-0001  
Telephone (505) 646-2432



OFF-CAMPUS EQUIPMENT NMSU-YE-1698 Ibb  
(Eighth Work Plan) 1-4-22735-847,848,849 (Other)

File: Yemen3

1. Troy Bilt Rotary Tillers (2 each) for SURDAD GARDEN WAY MFG.  
P. O. W06461 Vo 215571 12/21/87 \$2,323.50
2. Model 888P Test Scorer (2 each) serial K-15479 and K-15480  
1 for SURDAD, 1 for SANAA SCAN-TRON CORP. P. O. W06241  
Vo 212603 12/10/87 3,390.00
3. Hester Flow H280 SR# 0790 P. O. W07069 ) 1,380.00  
SIERRA INTERNATIONAL
4. Case/IH 530 Manuer Spreader SN C008095 P. O. W06742 ) 3,375.00  
Vo 173181 1/19/88
5. S Bottom lister P. O. W07362 ) 2,495.00  
for SURDAD
6. Myers 3 Point Hitch Ditch Vee for SURDAD ESTES INTL.  
P. O. W07078 Vo 171620 1/13/88 1,400.00
7. 1987 Polaris Trail Boss 4x4 Utility Vehicle for SURDAD  
GEORGETOWN CYCLE P. O. W06793 Vo 218011 2/3/88 2,745.00
8. Projector/Slide Viewer Audio AF/SF 220v-50HZ for SURDAD  
TROXELL COMMUNICATIONS P. O. W06790 Vo 222971 2/22/88 665.00
9. Eiki/Bell & Howell 16 mm Movie Projector-Silmosound/Slot-  
Threading SSL125 ) for SURDAD BROADWAY APPLIANCE 1,300.00  
P. O. W06788 Vo 220764
10. 3M Overhead Projectors 2130 Series 5 each ) 2/15/88 1,825.00
11. Case International 6200 Grain Drill Planter for SURDAD  
ESTES INTL FARM P. O. W07757 Vo 221913 2/17/88 8,819.00
12. Kodak IIIBR Slide Projector w/o lens 3 ea for SURDAD  
DAVIS AUDIO-VISUAL P. O. W06789 Vo 218014 2/3/88 1,044.00
13. 555 Mimeograph Printer 220V-50HZ ) A B DICK 2,185.00  
for SURDAD P. O. W06614
14. 595 Stencil Maker 220V-50HZ ) Vo 178325 3/7/88 1,695.00

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15. Transparency Maker 4550 Serial 290201 for SURDAD BUSINESS MACHINES P. O. W06883 Vo 177876 3/7/88	1,029.00
16. Opaque Projector VU-Lyte III for SURDAD TROXELL COMMUN. P. O. W06790 Vo 232155 4/18/88	662.50
17. Binding Machine for MOE OFFICE CONCEPTS F. O. X02233 Vo 210703 10/27/88	298.00
	-----
Total Equipment purchased thru 10/31/88	\$36,631.00

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BUSINESS AFFAIRS, DEPT. 3AA

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OFF-CAMPUS EQUIPMENT NMSU-YE-1698 Ibb  
(Nineth Work Plan) 1-4-22745 (Over \$500)

Re: Yemen4

. IBM Correcting Selectric II Typewriters with Arabic writer 582170714, 582170770, 582170774 3 @ \$2,850 ea for MOE P. O. X02304 TYTELL Typewriter Vo 210714 10/27/88	\$8,550.00
. MacIntosh SE Hard Dick 20CPU/Apple Keyboard 3 each for MOE P. O. X02455 APPLE COMPUTER, INC. Vo 025837 11/28/88	6,450.00
. Apple Scanner A9M0337 ) for MOE P. O. 02455 APPLE Vo 20410 11/3/88	1,187.00
. Imgwrttr I w/sys 8 cable & accessories - 3 each )	2,719.50
. 32 in. Riding Mower for SANAA P. O. X02322 HAYDENS HWD. Vo 026317 11/18/88	1,300.00
. EIKI SSL-0 16mm Movie Projector for SURDUD 2 @ 782.35 P. O. X02872 PHOTO & SOUND Vo 216182 12/19/88	1,564.70
. Sickle Bar Mower with B&SIC 3 @ \$995 ea serial nos. 88K3471BC, 88K3472EC, 88K3473BC 1 for SURDUD, 2 for SANAA P. O. X03460 KINCO MFG. Vo 213524 12/8/88	2,985.00
. Gasoline Welder/Miller Legend Aead 3 @\$2,120 ea 1 ea for SURDUD, SANAA, MOE P.O. X02880 NM STEEL Vo 213523 12/8/88	6,360.00
. Troy Bilt Rotary Tiller 2 ea @ \$1,359 1 ea for SANAA & MOE P. O. X02494 HAYDENS HWD Vo 213521 12/8/88	2,718.00
. Kuhn Power Tiller Model QUHN-EL35 s/n V0058 for SANAA P. O. X03579 MORRISONS, INC. Vo 22286 1/4/89	1,485.00
. Laser Writer IINTX w/Toner Cartridges for MOE P. O. X02455 APPLE COMPUTER, INC. Vo 31852 1/17/89	3,959.00
. Diesel Engine Tractors Case International Serial Nos. 17627696, 17627599, 17627600 1 ea for Ibb, surdud, Sanaa P. O. X02873 MORRISON'S, INC. Vo 18139 1/4/89	18,177.00

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3. EQABS/N12382 Bindomat 200 Rosback Perfect Finder ) for SANAA	2,985.00
4. EQABS/N580411 Platemaker ) P.O.'s X04432, X04769, X04516 AE DICK Vo 41916	3,645.00
5. EQABS/N2327 Offsett Dupl Press ) 3/27/89	7,730.75

BUSINESS AFFAIRS, DEPT. 3AA

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. Carpet Cleaner for SANAA P. O. X04586 HAYDENS HWD Vo 36048 3/1/89	734.38
. Electronic Stencil Maker & Mimeograph 1 each for MOE and WOMEN'S PROGRAM @ \$3,851 each P. O. X02387 AB DICK Vo 43254 3/29/89	7,702.00
. Transparency Maker 3440 220 volt 3 @ \$721 each - 1 each for SURDUD, MOE and WOMEN'S PROGRAM P. O. X02877 Troxell Communications Vo 43204 3/29/89	2,163.00
. Challenge Paper Cutter N2501 for SANAA P. O. X04316 A B DICK Vo 3634 4/3/89	4,227.00
tal Equipment purchased thru 4/30/89	<hr/> \$86,642.33

## BUSINESS AFFAIRS, DEPT. 3AA

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OFF-CAMPUS EQUIPMENT NMSU-YE-1693 Ibb  
(Tenth work Plan) 1-4-22751 (Over \$500)

file: Yemen4A

1.	Apple Macintosh SE/30 Serial F94575RM5390	)	\$3,116.00
		P. O. Y04187	
2.	Apple Macintosh SE w/20 Serial F944522M0028LL/A	)	2,220.00
3.	CMS 44MB External Removable Hard Disk	COMPUTERLAND	1,020.00
4.	Nu-Super Mini Pump	P. O. Y04525 STEELCON BLDG. Vo 096599 1/23/90	1,300.00
5.	Claw Assembly to fit super mini pump	P.O. Y04487 STEELCON BLDG. Vo 096604 1/23/90	600.00
6.	Tractor mounted spray tank #93849800	P.O. Y04171 TERRA INTL Vo 045370 2/19/90	1,060.00
7.	Mac Portable HD 40MB Serial XF939QV3 for Ibb	P.O. Y05408 COMPUTERLAND Vo 103255 2/15/90	4,159.00
8.	New Holland Forage Harvester Serial 805064	) 1 each	
	New Holland Forage Harvester Serial 805070	) for	
	New Holland 1 Row Corn Head Serial 758487	) Ibb and	
	New Holland 1 Row Corn Head Serial 780876	) Surdud	
		P.O. Y04973 EL PASO FORD NEW HOLLAND Vo 103322 3/15/90	2,200.00
9.	Shorline Flat-Top Hydraulic Table. PO Y05336. VO 49263 Serial: N/A		1,223.00
10.	Shorline V-Top Hydraulic Table. 2 each @ \$1375. each PO Y05361 VO 49263 Serial: N/A		2,750.00
Total Equipment purchased thru 6/30/90			<u>\$40,440.38</u>
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