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# MIDTERM EVALUATION OF THE FACULTY OF AGRICULTURE SUBPROJECT

**Prepared for:**

U.S. Agency for International Development

JUNE 1990

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### **Acronyms and Abbreviations**

<b>ADSP</b>	<b>Agricultural Development Support Project (implemented by CID)</b>
<b>ARA</b>	<b>Agricultural Research Authority</b>
<b>CORE</b>	<b>A subproject under ADSP designed to give broad institutional support to the MAF</b>
<b>CID</b>	<b>Consortium for International Development</b>
<b>CPO</b>	<b>Central Planning Organization (now Ministry of Planning and Development)</b>
<b>FOA</b>	<b>Faculty of Agriculture of Sana's University</b>
<b>FOA/ET</b>	<b>Faculty of Agriculture Subproject Evaluation Team</b>
<b>GRY</b>	<b>Government of the Republic of Yemen (unified)</b>
<b>LGU</b>	<b>U.S. land-grant universities</b>
<b>LOP</b>	<b>Life of Project</b>
<b>MAF</b>	<b>Ministry of Agriculture and Fisheries (old)</b>
<b>MAWR</b>	<b>Ministry of Agriculture and Water Resources (new)</b>
<b>MOE</b>	<b>Ministry of Education</b>
<b>MOF</b>	<b>Ministry of Finance</b>
<b>OSU</b>	<b>Oregon State University</b>
<b>PACD</b>	<b>Project Assistance Completion Date</b>
<b>SMY</b>	<b>Support Module Yemen</b>
<b>SU</b>	<b>Sana'a University</b>
<b>TFYP</b>	<b>Third Five-Year Plan (1986-91)</b>
<b>TL</b>	<b>Team Leader, FOA Subproject</b>
<b>USAID</b>	<b>United States Agency for International Development Mission in Yemen</b>
<b>YARG</b>	<b>Government of the former Yemen Arab Republic (North Yemen).</b>

## ACKNOWLEDGEMENTS

The International Science and Technology Institute, Inc. (ISTI) expresses its gratitude to the United States Agency for International Development (USAID) for the opportunity to carry out this Midterm Evaluation of the Faculty of Agriculture Subproject in Yemen. ISTI conducted team-building activities in Washington prior to the evaluation, which were then augmented in Sana'a by excellent team planning sessions supervised by Ben Hawley, the USAID Program Officer.

In Sana'a, our team was graciously received by the Sana'a University (SU) Vice-Rector, Dr. Abu Baker Al-Qirbi, and the Dean of the Faculty of Agriculture of Sana's University (FOA), Dr. Abdulla Al-Mujahed. The team is especially grateful for the opportunity to discuss issues fully and openly with SU officials, the Dean and Associate Dean of the FOA, and all faculty members. It has responded to its generous reception by producing a comprehensive and constructive report on the development, status, and prospects of the FOA.

The Team worked under the helpful guidance of Dr. Abdel Mostafa of USAID's Office of Agricultural and Rural Development. The Staff of his office provided essential secretarial support to complete the evaluation.

The Team's greatest debt is to the Subproject Team Leader (TL), Dr. Stanley Miller, and his office support staff who all offered friendly guidance and unflagging logistical support.

The Team was very impressed by the progress of the FOA since its inception in 1984. It commends Sana'a University, the FOA itself, USAID, and Consortium for International Development/Oregon State University (CID/OSU) for their joint achievements in this short period. All team members considered their participation in the evaluation to be a valuable professional experience and hope the results will be useful to the collaborating parties.

## EXECUTIVE SUMMARY

This midterm evaluation of the Faculty of Agriculture Subproject was conducted in Yemen by a four member team during May 20-June 18, 1990.

The FOA Subproject was approved in 1989 for 11 years with an authorized LOP funding of US\$ 29.2 million. CID has implemented the Subproject with OSU as lead institution.

The specific purpose of the Subproject is "to support the establishment within Sana'a University of Yemen's first Faculty of Agriculture that is responsive to private and public sector development and has appropriate linkage to the agriculture sector's production and institutional structures." The Faculty of Agriculture Subproject Evaluation Team (FOA/ET) pointed out that the subproject goal and purpose require that graduates be educated "to plan, manage, implement, and evaluate" and mandate research and extension/outreach responsibilities for the FOA.

The FOA/ET elected to carry out a comprehensive and systematic institutional assessment of the FOA, which involved five major dimensions and functions. Next, management by USAID, CID/OSU, and SU/FOA were evaluated. Finally, key issues and recommendations were formulated.

The first aspect assessed was strategic planning and development of the FOA. The FOA is a constituent faculty of a rapidly growing university, whose enrollment has reached 35,000. With unification, the country now has two universities and two faculties of agriculture. To avoid duplication, these two faculties should develop a memorandum of understanding specifying the role each will play in agricultural higher education in the Republic of Yemen.

The FOA/ET found no evidence that manpower planning has been considered in the design of the curriculum for the FOA. A study of the need for post-secondary, non-degree technical training of lower-level agriculturalists is recommended.

While recognizing the progress that the FOA and the lead university have achieved in designing a "competency-based" curriculum, the FOA/ET viewed the long list of competencies in nine areas as infeasible to teach in four years and too heavily weighted toward practical "hands-on" skills. The team stressed the need to "educate" FOA graduates by developing their intellectual capacities to understand their society and contribute to its agricultural and sociopolitical development through management and decision-making.

Information about the country's agricultural manpower needs and the employment and earnings profiles of FOA graduates is needed and should be collected annually. This information should be used to plan the size and educational programs of the FOA and evaluate the private and social rates of return to the investment in higher agricultural education.

The FOA carried out an initial long-range planning activity during 1989/90. This activity needs to be continued as a responsibility of a Long-Range Strategic Planning Committee formed by the Faculty Council that each year will provide a (rolling) 10-year plan that deals with objectives, issues, constraints, and priorities.

Management and governance of the FOA was the second major dimension addressed by the Team. The Faculty Council has outside members but their involvement is limited by poor attendance. The Faculty Council should meet quarterly on dates specified in advance with an agenda and materials provided for review. Any member missing as many as two meetings a year should be replaced.

The FOA/ET strongly recommended more decentralized management and participatory governance for the FOA. The Associate Dean should be designated in-charge of instruction. Coordinators should be appointed for research and extension/outreach activities. The number of FOA committees should be reduced to four (curriculum/instruction, research, extension/outreach, and instructional farm). The first should be chaired by

the Associate Dean, the next two by the respective faculty coordinators, and the fourth by a faculty member. Committee responsibilities and authority should be clearly spelled out.

To relieve faculty members of unnecessary administrative burdens, the FOA administrative staff should be trained to take over student registration and academic record-keeping. They should be provided with computer capability and a simple system designed to automate the administrative operations.

With respect to curriculum, the team found that students, faculty members, and employing agencies all felt specialized instruction is needed. It recommended, however, that all students receive strong general training during the first two or three years and then have the option of electing among a few broad specializations, which should be strictly limited to those with good employment opportunities and adequate staffing to offer the necessary courses.

The team called for a course on Yemen's rural development that emphasizes the role of women in agriculture and rural households as a general requirement. It also recommended that the present Department of Agricultural Economics and Extension should become the Department of Rural Social Sciences with sections in Agricultural Economics, Rural Sociology, and Agricultural Education and Extension. Staffing needs for this expanded department should be reviewed.

The team felt that the FOA should make more use of basic courses in other faculties as it does in the Faculty of Sciences. These should be regular courses that give FOA students sound preparation in biological, physical, mathematical, and social sciences.

The FOA/ET urged that qualified Yemeni professors be added to the FOA as quickly as possible. The recent acceleration in faculty development is encouraged, as is additional recruitment of existing Yemeni professionals. Future technical assistance provided by the Subproject should be limited to long- and short-term assignments that have a clear advisory/developmental justification. If additional on-line professors are needed to handle the teaching load, and expatriate professors are funded by the Subproject, they should be contracted by Sana'a University and subject to its requirements, rules, and regulations.

The FOA/ET regarded the Instructional Farm as a unique educational resource. The Instructional Farm Committee and the departments should be more involved in its management and utilization. The FOA's Special Account should be placed under the control of the committee and used first to pay the operating costs of the farm. Any surplus should be used to fund instructional improvements.

The FOA/ET was appalled by the long periods of advanced degree study by some of the faculty trainees. It recommended that a limit of five years be allowed to complete work through preliminary examinations for the Ph.D degree, after which the trainees should return to Yemen to undertake their dissertation research. Visits of research advisors should be funded to expose the FOA to more international agricultural scientists.

The FOA will soon occupy a modern complex of fully equipped buildings, which will compare favorably to facilities at institutions in developed as well as other developing countries. Proper operation and adequate maintenance of the equipment and buildings is absolutely essential. Training for equipment operation and maintenance is needed during 1990/91. SU should be encouraged to execute the proposed contract for building maintenance and custodial care.

A Librarian for the new facility has been selected but is in language study and then will go for Master's training in the United States. While the Subproject plans to provide TDY assistance for the Library, the FOA/ET concluded that a local, bilingual librarian should be employed by the Subproject as an interim measure for 2-3 years.

An impressive computer network is included in the new facility. The team saw little use being made of the existing computers that are locked in cabinets inside a locked room. Additional efforts are needed to train faculty members and encourage computer use for teaching, research, and administration. What has already been achieved in the Animal Science Department can provide a model for other departments.

Research is necessary for the continued professional growth of all faculty members, as well as to forge linkages to government research agencies and the agricultural sector generally. Extension/outreach activities are also needed to forge the linkages of the FOA to the public and private agricultural sectors, which is essential for its own long-run viability. Faculty committees for research and extension/outreach, chaired by coordinators for these activities, have been recommended. Use of the instructional farm for research compatible with teaching should be encouraged. The FOA should define its extension/outreach role in terms of production of scientific and technical information and in-service training of extension agents.

Subproject management would benefit from improvement of collaboration among the three parties. USAID should expand its dialogue with SU officials, the FOA Faculty Council, and faculty members, concentrating on goals, constraints, and priorities. A more effective counterpart relationship between the Dean and Team Leader is needed so that the expertise and experience of the team leader can be more fully utilized. The Team Leader should function in an advisory, developmental role and be included in committees, management meetings, the Faculty Council, and the Long-Range Strategic Planning Committee.

A standardized system of job descriptions, evaluation criteria, reporting of accomplishments, and annual performance evaluations should be instituted for all faculty members.

Sustainability is the key long-term issue concerning the FOA and the Subproject. The FOA/ET believes the decision to establish the FOA was correct and that SU and the FOA itself should take great pride in what has been achieved since 1984. USAID has provided generous budget support and all parties must share the concerns the FOA/ET has identified about the long-term sustainability of the FOA at a level that fulfills the aspiration of SU and meets the needs of Yemen's agricultural public and private sectors. The team provided some suggestions for promoting the FOA's sustainability. It further recommended that the FOA Dean and the Subproject Team Leader provide a joint report each year to the SU administration and USAID that assesses progress toward sustainability achieved that year and sets goals for the coming year. The success of this continuous effort over the next five years should be one of the main factors in USAID's determination of future support for the FOA following termination of the Subproject.

## I. INTRODUCTION

This report contains a midterm evaluation of the Faculty of Agriculture Subproject. The evaluation was conducted in Yemen during May 20 - June 18, 1990.

The FOA Subproject was approved in 1985 for 11 years with an authorized LOP funding of US\$ 29.2 million. It was designed under the CORE Subproject of the umbrella CID Agricultural Development Services Project. CID has also implemented this Subproject with Oregon State University as the lead institution.

According to the Logical Framework the goal of the Subproject is "to increase rural incomes in the YAR through agricultural development". This is a long-term proposition, reflecting the impact of education on agricultural productivity.

The more operational subgoal is "to increase the supply of appropriately trained Yemeni men and women to plan, manage, implement, and evaluate development activities in the private and public agricultural sectors of the YAR." Again, this subgoal is based on the generally accepted proposition that education increases productivity. Note that the implicit definition of "appropriate training" in the subgoal is "to plan, manage, implement, and evaluate."

The specific purpose of the Subproject is "to support the establishment within Sana'a University of Yemen's first faculty of agriculture that is responsive to private and public sector development and has appropriate linkage to the agriculture sector's production and institutional structure." Thus the purpose was narrowed to the creation of a faculty of agriculture to offer undergraduate degrees in agricultural sciences. That choice must necessarily be viewed in terms of other types and levels of training needed to produce manpower for agricultural development, as well as alternative educational investments.

It should also be noted that the purpose cannot be achieved merely by producing bachelor degree-holders. The FOA is directed to be responsive to private and public needs and linked to agricultural production and institutions. Thus research and extension/outreach responsibilities are inherent in the statement of purpose for the Subproject.

The connection of the educational programs of the FOA to agricultural productivity and growth requires clarification. In the first instance students can be "trained" in that they develop certain competencies and skills. Such knowledge may permit them to perform specified jobs for public and private employers. But graduates are also expected to be able to "plan, manage, implement, and evaluate." These capabilities require a different type and level of education, based on scientific method and the intellectual ability to conceptualize and analyze. This type of educated person is at once one of the most scarce resources in Yemen and also one of the most likely to contribute to the country's agricultural growth and development. The FOA is training skilled and capable employees but it is also educating Yemen's future public and private sector managers and decision-makers.<sup>1</sup>

The Faculty of Agriculture Subproject Evaluation Team chose to proceed by undertaking a comprehensive and systematic institutional assessment of the FOA. It organized this assessment around five major dimensions and functions of the Faculty. Conclusions are drawn and recommendations made on each aspect. Then the FOA/ET looked at management of the Subproject from the perspective of each of the three collaborating parties: USAID, CID/OSU, and SU/FOA. Finally, to draw together the main results of the evaluation, a concluding section on key issues and recommendations is presented.

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<sup>1</sup>This point is supported by the indication in a student survey we conducted that one student aspires to be minister of agriculture while another wants to be dean of the FOA.

## II. INSTITUTIONAL ANALYSIS OF THE FOA

### A. Strategic Planning and Development of the FOA

Interest in initiating instruction in agriculture arose at SU shortly after it was established in 1970. SU was North Yemen's only university and no agricultural higher education was then available in the country. A few agriculturally-trained scientists were teaching in the Science and Commerce Faculties of SU by the late 1970s but early efforts to establish an agricultural degree program there did not succeed.

Serious consideration began to be given to organizing an agricultural faculty in the early 1980s. An important step was a paper prepared by Dr Nasser Al-Aulaqui, who was then teaching in the Faculty of Commerce and Economics and serving as an advisor to the Ministry of Agriculture and Fisheries (MAF), that proposed a rationale for locating an agricultural faculty at the new SU campus so that it could operate in close association with other faculties of the University. His proposal received support within SU and YARG as well as from several missions by Arab and international donors. USAID expressed strong interest in supporting the new faculty provided funds for it could be obtained from other donors. CID, already engaged in a complex set of agricultural activities designed and implemented under the Title XII collaborative mode, was given the job of designing a program to assist the FOA as a new subproject under its overall Agricultural Development Services Project.

The design efforts involved a study tour conducted jointly by CID and SU to choose a "model" for the FOA. These design activities culminated in the preparation and approval in 1985 of an 11-year subproject with a LOP funding of US\$ 29.2 million, implemented by CID under its Agricultural Development Support Project (ADSP) with Oregon State University as lead institution.

Prior to the approval of the USAID support, the YARG and SU formally established the FOA in 1984. A Dean (Dr Nasser) and Associate Dean were appointed. The first students were admitted in September 1984, studying basic science courses in the Faculty of Science. Temporary facilities for the FOA were arranged in the Faculty of Commerce and Economics. Thus the infant FOA was born: its subsequent development, current status, and future prospects are assessed in this evaluation report.

Two important aspects of the immediate and national environment in which the FOA operates should be noted. First, SU is a rapidly growing institution. It has expanded both the number of its constituent faculties and its total enrollment, the latter currently reaching some 35,000 students.<sup>2</sup>

By national policy, education -- including higher education -- is free, at least as far as tuition is concerned. Since few dormitory accommodations are available, however, most students must bear the costs for their room and board. The emerging organization of the Government of Yemen is expected to include a new Ministry of Higher Education and Research that will administer the country's universities. This change would alter the status of SU, which until now has operated as an autonomous entity governed by a board chaired by the Deputy Prime Minister and receiving its operating budget directly from the Ministry of Finance. It was suggested to the FOA/ET that university enrollment in the future will be more closely related to national needs for trained manpower. Such a policy would have important implications for both the size and sustainability of the FOA.

The second aspect is the unification of the two Yemens. The unified country now has two universities, SU and Aden University in the South. Aden University has a Faculty of Agriculture located at Lahg. It is older than SU/FOA and thus has produced more graduates. Its enrollment, however, is less than that of SU/FOA (around 200). Some initial discussions between the two FOA's have already taken place. They have recognized the need to avoid duplication and coordinate areas of specialization. Further discussions should

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<sup>2</sup>In a matter of only a few years the Faculty of Commerce and Economics has tripled its enrollment from 4,000 to 12,000 students currently.

be encouraged leading ultimately to some type of formal agreement between the two faculties specifying the role each will play in agricultural higher education in the unified Republic of Yemen.

## **1. National Manpower Needs and the FOA**

As the public sector in the then YAR emerged and expanded after the 1962 revolution, trained manpower was widely recognized as a key constraint to the scope and effectiveness of its management, policy, and service functions. This was as much or more the case in the agricultural sector as in other parts of the economy. The YARG, with extensive donor assistance, initiated a wide variety of institution -- building, infrastructure, regional, and service-delivery projects to promote the country's agricultural development. Insufficiently trained nationals were available to staff this plethora of projects, leading to wide use of expatriate personnel.

Thus in the 1960s and 1970s a need for more trained agricultural manpower was accepted but not well quantified. In 1979, the World Bank estimated the number of university trained persons needed in the agricultural sector compared to the number available for the four-year period 1977-1980.<sup>3</sup>

The results showed a need of 235 versus a supply of 132. The estimates were broken down by fields of specialization. Relevant to the FOA subproject, only in the area of general agriculture was there found to be an excess of the number available over the number needed. That point does not seem to have been recognized in the design of the Subproject and subsequent curriculum development.

With no institution offering higher agricultural education in the country, what was the source of university-trained agriculturalists? Obviously the answer is that they were being trained abroad in a variety of countries with scholarship support from donors. Data assembled for the Subproject paper showed that a total of 748 Yemeni students were sent abroad for four year and five year undergraduate degree programs in agricultural fields during 1974 - 80. As many as 710 were expected to return to the country during 1980 - 86.

Given this situation, the economic analysis of the Subproject took a "least-cost" approach, justifying the FOA as a cheaper source of trained manpower than training abroad. The expected savings were high when training in Yemen was compared to training in the U.S., but much more modest when compared to training in Egyptian universities.

The FOA/ET believes the Government of Yemen should now review its policies on overseas study. How many students are still being given scholarships for undergraduate study abroad in agricultural fields?<sup>4</sup> Moreover, as FOA enrollment nears 600 and the number of graduates grows to 100 or more per year, the question of the demand and supply of university trained agricultural manpower merits further analysis.

One void in the discussion of manpower development in the Subproject paper and other ADSP documents is the need for an intermediate level of training between the agricultural secondary schools and the B.S. degree granted by the FOA. Such lower-level, more practical and applied technical training might well meet some of the requirements of the agricultural public and private sectors more cost-effectively than university degree holders trained nationally or abroad. The FOA/ET recommends that this possibility be systematically explored by the Government of Yemen. We understand that an inter-ministerial committee on higher agricultural education exists, which may well be the appropriate body for investigation of this question and determination of the need and feasibility for a post-secondary, non-degree program to train lower-level agriculturalists.

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<sup>3</sup> World Bank (1979). Yemen Arab Republic; Development of a Traditional Economy. Washington, DC, p.303. (Data taken from the Subproject paper, p.J-6.)

<sup>4</sup> We understand that USAID no longer supports US or Third Country Scholarships for undergraduate agricultural education under Core. The GRY should adopt a similar policy.

The most recent assessment of manpower needs available to the FOA/ET dealt only with the MAF and was prepared for the Third Five-Year Plan (TFYP).<sup>5</sup> It showed that 616 bachelor degree-holders would be needed by the Ministry directorates, the authorities, fisheries, and the cooperative and agricultural credit bank, over the period of the third plan. For the same period, a need for 896 persons with technical level training was forecast. Although the authors themselves termed these estimates "unrealistically high", they were still used as a basis for evaluating manpower availability.

Of interest to this report, the assessment indicated the needs for professional level manpower (BS, MS, PhD) by broad areas of specialty as follows:

Administration and Finance	145
Economics and Statistics	64
Agricultural Extension	37
Agronomy and Field Crops	53
Animal and Poultry Production	73
Veterinary Services	69
Agricultural Mechanization	10
Plant Protection	81
Civil and Irrigation Engineering	69
Horticulture and Nurseries	76
Fisheries	28
Forestry	12
Library	4
General agriculture	<u>83</u>
Total	754 (616 BS)

After considering the expected supply, the manpower study concluded that many new jobs needing specialized preparation would have to be filled with persons trained in general agriculture. It observed that the need to overcome the lack of specialized training of graduates would require funds for on-the-job training as well as intensive short-term training abroad. This lack of fit between needs and availabilities was expected to arise primarily because the bulk of those in training abroad and those expecting to graduate from the FOA were to be trained in general agriculture (553 out of 615). The study also showed that the output of the existing agricultural secondary schools would be far less than the need for technical (non-degree) personnel in the TFYP period.

Soon after the manpower planning exercise was completed, a joint Yemeni-US team carried out a needs assessment for the FOA curriculum.<sup>6</sup> This admirable study was designed to identify a list of core competencies that should be taught in each of nine areas of agriculture. It assumed that all students would pursue a program in general agriculture following a curriculum incorporating the core competencies in each of the nine areas. We have several comments about this study and the subsequent curriculum development process at the FOA.

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Amann, V., G.R. Law, and A. Al-Akwa (1986). An Assessment of the Manpower Development Needs for the Ministry of Agriculture and Fisheries During the Third Five-Year Plan of the Yemen Arab Republic. MAF: Directorate of Planning and Statistics.

<sup>6</sup>Fancher, B.E. and R.V. Herren (1987). A Competency-Based Curriculum for the Faculty of Agriculture at Sana'a University: Needs Assessment and Recommendations. Corvallis, Oregon: Faculty of Agriculture Subproject, Project Publication Series No. 87-1.

First, the study took no account of the existing manpower planning information. Indeed, its basic premise -- the need for more persons with training in general agriculture -- seems inconsistent with the results of the analysis of needs and availabilities of trained manpower for the MAF as reviewed above.

Second, the list of competencies the reports recommend for FOA students is devoid of knowledge and attitudes central to higher education. The first priority for any university is to produce "educated" persons. That is, persons with knowledge and intellectual capacities to understand their society and contribute to its progress through informed and rational participation in its sociopolitical development and decision-making processes. Recognition of this inherent liberal content of true university education is missing from the documents and discussion of the FOA curriculum.

Third, the list of competencies for each of the nine areas is heavily weighted toward practical "hands-on" skills. The question arises as to how many of these skills are really necessary for B.S. graduates versus graduates of the agricultural secondary schools and post-secondary technical training schools, were the latter to be offered in the country. Moreover, taken altogether, the entire list of core competencies for the nine areas is far beyond the capability of any 4-year degree program to achieve, whatever the relative emphasis on scientific knowledge and practical skills.

The competencies designated for agricultural economics can serve as an example. This general area is subdivided into subareas of agricultural economics, agricultural management, and production planning. Taken together, the competencies for the three sub-areas exceed the knowledge and capabilities of specialized agricultural economics graduates in U.S. universities. Yet, these competencies represent only one of nine areas in which each graduate is to be trained!

One area that the FOA/ET believes is under-represented is the knowledge and skills for dealing with small farm households. Competencies for extension are specified largely in terms of skills for preparing and delivering educational materials. Yet the manpower assessment shows a high requirement for rural development staff. We believe that need requires graduates who are trained to analyze and understand the complex decision-making and socioeconomic interactions of small-farm households. The role of women in agricultural and household production and decision-making is of particular importance in Yemen, yet completely ignored in the identification of competencies.

A second area of high needs according to the manpower study but inadequately considered in the FOA curriculum planning is "administration and finance". What competencies are implied by this area? Which specialization in the FOA can best serve this need?

The FOA should do more analysis of future manpower needs for B.S.-level graduates. In this, it should cooperate with Central Planning Organization (CPO) and the Directorate of Planning and Statistics of the Ministry of Agriculture and Water Resources (MAWR). It is especially important to forecast the types of positions in the public and private sectors that the FOA graduates will occupy in the future. For example, will they be employed in increasing numbers as field extension workers, as is already happening in the Central Highlands Regional Development Project? Or will their posts predominantly be in directorates and departments of the Ministry and authorities, thus requiring more specialized training? Continuous monitoring of employment patterns and manpower needs will provide more information for planning educational programs at the FOA. It is important that this analysis include the private sector as well as the public sector.

Furthermore, the FOA needs to systematically track the employment and earning profiles of its graduates. These data are needed to estimate the private and social costs and returns of agricultural higher education provided at SU. An annual survey should be carried out. Calculation of *ex post* rates of return to these educational investments will supplement the weak economic analysis in the project paper and provide a better basis for allocating Government of the Republic of Yemen (GRY) and donor resources in the future. In particular, SU/FOA enrollment trends and policies should be carefully considered in terms of the needs for and availabilities of BS-level graduates, employment and earnings profiles, and private and social economic rates of return to educational investments.

## **2. SU/FOA Long-Term Plan and Planning**

During 1989 - 90, a long-term planning activity for the period 1990/91 through 2000/2001 was undertaken in the FOA. It was the responsibility of the Department of Agricultural Economics and Extension and headed by Professor Abdel-Naby. The results were submitted to the Dean in May 1990.

The FOA/ET commends the Dean and the participating faculty members for their efforts in preparing the plan. It contains an overview of the background and development of the FOA, its tasks, functions, and activities, a detailed manpower needs assessment, and projected budget requirements. It is a good initial effort at drafting a long-range plan for the FOA. It projects the FOA as entering the next millennium with an enrollment reaching 800, a need for professorial staff jumping from 21 at present to 51 in the early 1990s and then to 78 by the end of the plan period. Similar increases are projected for sub-professorial and technical support staff. Budget requirements are projected based on a decline in Subproject funds after 1994 and a cessation of Subproject support in 1996. Although the plan does not identify the source of non-subproject funds, presumably SU is expected to raise its budget contribution to 22.5 million YR in the first part of the plan period and then to 33.5 million YR in the second part. These figures should be compared to SU's current contribution of 3-4 million YR. If the plan figures are in real terms, then nominal budget amounts would have to rise by even more than the multiple of 10 indicated above.

The FOA/ET believes that long-term planning should be a continuous process. It recommends that a long-range strategic planning committee be formed to report annually to the Faculty Council. The Subproject TL should serve as an *ex officio* member of this committee. This committee should review the achievements of the FOA each year and project its future for a 10-year (rolling) period. The committee should be concerned with specific objectives, issues, constraints, and priorities. This is the essence of institutional planning, but recognition of the need to establish priorities and make the very best use of limited resources is missing from the current plan.

## **3. Summary of Recommendations**

- SU/FOA should sign a Memorandum of Understanding with Aden University agreeing on the roles of the faculties of agriculture in the two universities.
- The Ministry of Higher Education and the MAWR should conduct a needs assessment for post-secondary technical, diploma training in agriculture.
- The GRY should follow USAID's lead and discontinue granting of scholarship support for undergraduate agricultural study abroad, at least in general agriculture and the specializations offered by the FOA.
- The FOA and MAWR should determine the future need for BS-level graduates and the types of jobs they are needed for, in both the private and public agricultural sectors. This manpower assessment should be used to plan the size and specializations of the FOA.
- The FOA should carry out an annual survey of the employment and earnings of its graduates. This information should be used for planning in the FOA and for evaluation of private and social costs and returns to investments in agricultural higher education.
- The Faculty Council of the FOA should form a long-range strategic planning committee. This committee should annually update a 10-year plan for the FOA that deals with objectives, constraints, and priorities for the use of limited resources.

## **B. FOA Management and Governance**

Physical facilities, curricula, faculty members, and students are all necessary for the FOA to achieve its mission. Given these elements, its success further requires that it have visionary leadership, efficient and equitable management, effective internal and external institutional linkages, and a governance system that

promotes full and free participation by faculty members in decision-making. These crucial aspects of the FOA are assessed in this section.

## **1. FOA's Relationship to Sana'a University**

The FOA is one of the constituent faculties of SU. The Dean represents the FOA at the SU level as a member of the University Council.<sup>7</sup> Major operational and administrative decisions affecting the FOA are taken by the University Council. These include approval of admissions, curricula and specializations, and fixing the academic calendar.

The SU budget is negotiated annually with the Ministry of Finance. The approved budget comes to the SU as a fixed total. The allocation of this budget to the various faculties is determined by the University Council. Expenditures are monitored and approved by a Ministry of Finance official located within the SU Fiscal Office.

Two important trends are affecting the SU budget situation:

- A rapid increase in the overall number of students enrolled, which is reflected in the increase in the number of students in the FOA.
- A failure of the SU budget to increase and a reduction in overall donor support for SU.

These trends imply that resources per student are falling at SU, with adverse consequences for the quality of its education and sustainability of its programs. The GRY needs to reconsider the role of, and financing for, higher education in the country. The Ministry of Higher Education and Research should be directed to undertake a comprehensive needs assessment for higher education and an evaluation of the private and social costs and returns to alternative types and levels of educational investments. The results of these analyses should be used to plan the quantity, quality, and sustainability of SU programs including the FOA.

## **2. Linkage to the Ministry of Agriculture and Water Resources**

SU is not structured like a U.S. land-grant university (LGU) and its FOA has neither operational responsibility nor direct government budget support for agricultural research and extension. There is a good deal of wishful thinking reflected in the Subproject Paper and other documents about the eventual evolution of the FOA into this "LGU model". The FOA/ET considers this view to be unrealistic: the FOA will remain a unit of SU within the system of higher education while agricultural research and extension will remain the primary responsibility of the MAWR and its authorities.

That said, the FOA can not achieve its mission without developing close linkages to the MAWR. This ministry, as the key entity in the agricultural public sector, is the primary employer of FOA graduates. Moreover, the linkage to MAWR is essential if the educational program and research and outreach activities of the FOA are to be connected to the reality of Yemen's agricultural sector and supportive of its technological and socioeconomic progress.

Formal institutional linkages already exist through the Faculty Council of the FOA and the board of A.R.A.:

- Four members of the FOA Faculty Council are from the MAWR and the authorities.
- The FOA Dean is a member of ARA's board of directors

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<sup>7</sup>The University Council is chaired by the Rector. Its members are the Vice-Rector and deans of the faculties. It is the highest decision-making body within SU. SU is governed by an appointed board currently chaired by the Deputy Prime Minister with other outside members. With the creation of the Ministry of Higher Education and Research, the Minister is expected to chair the governing board.

There are some indications that interaction is taking place, other signs indicate that linkages are weak and need to be strengthened.

Both ARA and FOA staff indicated that faculty members have participated in the determination of agricultural research priorities for ARA. This participation was especially strong in the area of animal production. It is discussed further in Section E on research and extension.

According to the minutes of the four meetings of the Faculty Council held in 1989 - 90, two members from the MAWR attended one meeting each. The other MAWR members did not attend any of the four meetings, and no member from MAWR was present at two of the four meetings. The FOA/ET received some indication that outside members felt they were not notified of the meetings sufficiently in advance or given an agenda and materials to study prior to the meetings. Clearly, more informed and consistent participation of the outside members of the Faculty Council are needed.

ARA would be responsive to developing closer working relationships with FOA. Personal incompatibilities, as might now exist, should not be allowed to limit future cooperation and collaboration. ARA could provide support for field research conducted jointly by its staff and faculty members. FOA needs to aggressively pursue these opportunities and encourage its faculty members to be more entrepreneurial in seeking outside contracts, grants, and collaborative support from ARA, the regional projects and authorities, and international donors. Success in such endeavors will enhance the sustainability of the FOA in the long-term.

For its part, the FOA should make greater use of Ministry personnel as part-time teachers, especially to support its more advanced specialized instruction. Their use seems to have dropped off recently. It should be increased, driven not so much by the need to handle larger enrollments as by the opportunity to expose students to established Yemeni agricultural scientists working on relevant and practical production problems in the country.

### 3. FOA Organization and Management

The **Dean** is the highest academic and administrative officer of the FOA. He is appointed by the SU Rector for a 2-year term, which is renewable. An **Associate Dean** is also appointed by the Rector on the recommendation of the Dean. He is likewise appointed for a two-year renewable term. The Associate Dean is a member of the Faculty Council and is responsible for all matters that the Dean delegates to him. The incumbent is in charge of student affairs and chairs the Instructional Farm Committee.

The **Faculty Council** is the highest policy body of the FOA. It is chaired by the Dean. The Associate Dean, department and section heads are members. Its six outside members are:<sup>8</sup>

- Associate Dean of the Faculty of Science;
- Deputy Minister of Agriculture;
- General Director, Agricultural Research Authority;
- Head, Eastern Region Development Project;
- Head, Tihama Development Authority; and
- Head, Agriculture and Rural Development Authority.

Although charged by the articles of the FOA with decisions on admission and granting of degrees, the Council is more an advisory body than a governing board. It reaches decision by consensus, which are advisory to the Dean and which must then be acted on through the administrative structure of SU.

The FOA at present has five departments, each chaired by a department head appointed by the Dean. All five current department heads are expatriate professors whose contracts must be renewed annually. With the limited number of faculty members, the departments vary from a one-professor unit (food science) to a department with three sections (plant production).

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<sup>8</sup> As reported in the Faculty of Agriculture Catalogue, p.10.

The FOA/ET was very favorably impressed by the animal science department. In terms of the development of Yemeni faculty, research, teaching and administrative use of computers, and encouragement of research, it is providing a good model for other departments to emulate. (Further discussion of departments is included in Section C.)

Six committees exist now within the FOA:

- The scientific committee chaired by the Dean
- The instructional farm committee chaired by the Associate Dean
- The library committee chaired by a faculty member
- The student's affairs committee chaired by the Associate Dean
- The scientific journal editorial board chaired by the Dean
- The laboratories committee chaired by the associate Dean.

These are considered advisory committees. It is the general feeling within the faculty that these committees do not have clearly specified functions and authority to make decisions.

In addition to these committees, two administrative groups exist within FOA. These are:

- The administrative faculty staff composed of the Dean, the Associate Dean, and the Academic Advisor (Dr Abdelhamid Butt).
- The FOA administrative staff consisting of the Controller, the Student Affairs Officer, and two secretaries (one of the secretaries is funded by the Subproject to support the departments). The FOA/ET was informed that an additional accountant (expatriate) has been appointed by the Dean to handle the special account that receives sales from the farm and rent payment for expatriate professors supported by USAID funds.

A/ET found that the organizational entities within the FOA are also less operational than they are. The actual participation of faculty members in decision-making appears to be low, primarily as a result of over-centralized administrative control by the Dean.

Faculty members concerned with the FOA should remember that it is a young institution, still at the beginning of its process of growth and development. As such, it requires strong and inspirational leadership to direct it and to establish viable linkages with other institutions and agencies and lead it to occupy its appropriate place in the process of agricultural, rural, and overall national development. For success, SU and FOA leadership should be committed to a sound and sustainable process of institutional development based on a philosophy of maximum participation by faculty members in the conduct and control of the FOA's educational, research, and outreach programs. This participation should be institutionalized through management processes and incentives that stimulate faculty innovation and creativity to the benefit of the quality of FOA's education, research, and contribution to the country's agricultural and rural development.

The following recommendations are offered to help implement this vision of a management system that encourages each faculty member to make his/her maximum contribution to the progress of the FOA.

- Sub-dean coordinators: To provide for more faculty participation and decentralized administration, we recommend that the Associate Dean be designated in-charge of instruction and curriculum and that coordinators be appointed for FOA research and extension/outreach activities. More discussion of these positions is provided elsewhere in the report.

- Department heads: As soon as feasible, Yemeni professors should be appointed to head all FOA departments.<sup>9</sup> Moreover, departmental faculty members should be involved in the designation of department heads and the recruitment of new faculty members.
- Committees: While the existing committee structure may be appropriate for a larger academic unit, we recommend that the number of committees be reduced to four associated with the major missions of the FOA,
  - Curriculum and instruction;
  - Research;
  - Extension/outreach;
  - Instructional farm.

The Associate Dean for Curriculum/Instruction should chair the curriculum/instruction committee. The other committees should be chaired by faculty members.

Where specialized support activities are involved (practical training, library, computers) they can be made the responsibility of sub-committees of the parent instruction/curriculum committee.

The research committee can take over the editing of the FOA's journal. The chairman of this committee could serve as editor-in-charge and the membership of the committee could form the editorial board.

The FOA's Special Account should be managed by the Instructional Farm Committee. The first priority for support should go to the instructional farm itself. Any surplus should then go to improve instruction. The accounts operation should be consistent with the fiscal regulations of SU.

- Student Affairs: At the present time, registration and recording of grades is taking a great amount of faculty time. These functions should be performed by the administrative staff. The staff should be trained, provided software, and given access to computers so that registration and student record-keeping can be computerized. What has already been accomplished in the Animal Science Department can be used to design a viable system for the entire FOA. A simple, sustainable approach is preferred to a complex, sophisticated system that might not be maintained.<sup>10</sup>

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<sup>9</sup>This should be done gradually. When young, new Yemeni Ph.D.s return to the faculty, they should not immediately be made department heads. They first need time to establish themselves professionally as teachers and researchers, and only then take an administrative appointment.

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One of the work plans reported that a Peace Corps volunteer designed a computerized records system for the FOA. We saw no evidence that it is currently being used. Its design using English software was one of the problems.

#### **4. Summary of Recommendations**

- The Ministry of Higher Education and Research, in cooperation with the Ministry of Planning and Development, should undertake a comprehensive needs assessment for higher education in Yemen and evaluate the private and social costs and returns under the GRY policy of free education. The FOA should cooperate in the study \*with reference to university-level agricultural education. The MAWR should also be involved in the analysis
- FOA faculty members should be encouraged to interact with ARA staff and collaborate on research activities.
- More use should be made of ARA staff as part-time professors, especially in advanced courses in the FOA specializations.
- The Faculty Council should meet each quarter on specified dates. An agenda and supporting materials should be provided to the members for review prior to each meeting. Any member missing two or more meetings a year should be replaced.
- The Associate Dean should be designated in-charge of instruction.
- The number of FOA committees should be reduced to four: curriculum/instruction, research, extension/outreach, and instructional farm. The curriculum/instruction committee should be chaired by the Associate Dean, the second two by faculty coordinators for research and extension, and the fourth by a faculty member. Committee responsibilities should be clearly specified and their authority recognized..
- Registration and record-keeping should be the responsibility of the FOA administrative staff. They should be trained and provided with computer capability and a simple system using Arabic software designed to automate the operations.

#### **C. Curriculum and Instruction**

The FOA at the time of this writing is in its sixth year of operation, having been established in 1984. While it matriculated students for the academic year 1984-85, it only began teaching undergraduate courses in 1985-86. It has a major role to play in the agricultural and socioeconomic development of the newly unified Republic of Yemen.

This section of the report deals with curriculum, the instructional farm, the faculty, and the students. A summary of recommendations appears at the end of the section.

##### **1. Curriculum**

##### **a. Background**

As highlighted in a previous report,<sup>11</sup> there were no assessments or courses in Yemen upon which to base curriculum needs prior to the FOA's establishment. Consequently, the FOA was forced to rely on

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<sup>11</sup>Fancher, B.E. & Herren, R.V. (1987). A Competency-Based Curriculum for the Faculty of Agriculture at Sanaa University: Needs Assessment and Recommendations. Corvallis, OR: Oregon State University (Yemen Agricultural Development Support Project, Faculty of Agriculture Subproject, Project Publication Series 87-1.)

curriculum as well as faculty transferred from other institutions. In its initial period, the FOA comprised of ten faculty members educated at ten different institutions in six different countries. Inevitably, problems arose with respect to curriculum consistency. Approaches to curriculum varied widely among the professors. There could be no confidence that any transferred models would be suitable to the needs of the Yemeni agriculture sector.

As mentioned in Section III A, in 1986, OSU initiated the development of a competency-based curriculum covering nine core competencies for the FOA. This competency-based approach centered around providing learners with specific skills or competencies within specific discipline areas.

OSU initially developed lists of proposed core competencies based upon the curriculum at the School of Agriculture at California Polytechnic Institute at San Luis Obispo (Cal Poly). Cal Poly's curriculum was judged to contain a good balance of theory and application. The curriculum instrument was then validated at the College of Agricultural Sciences at OSU, in part because the FOA at Sana'a University had expressed a desire "to model their institution after a modified version of the Land Grant Model."<sup>12</sup> In order to provide a Middle East perspective, the Faculty of the University of Jordan was approached for their reaction to the instrument. The instrument was then further refined by the FOA following an in-country needs assessment involving the FOA, the MAF, and the private sector. The recommended curriculum stressed the need for building a practical, cohesive curriculum that would fit the needs of Yemeni agriculture. However, as discussed in Section III A, the curriculum developers failed to take note of the manpower needs assessments carried out by the MAF's Directorate of Planning and Statistics in connection with the Manpower Development Plan for the TFYP, especially as regards the excess supply of persons trained in general agriculture.

In 1988, the FOA competency-based curriculum was further developed.<sup>13</sup> The recommended lists of competencies derived from the Fancher & Herren report<sup>14</sup> provided the basis for the course objectives of each of the course outlines. The teaching strategies and resources needed were specified. Course planning outlines were developed under the following headings: Food Sciences and Technology, Plant Production and Protection, Animal Production and Protection, Agricultural Mechanics and Soil Science, and Agricultural Economics and Agricultural Extension. Each course planning outline indicated the specific uses of the Instructional Farm and/or other laboratories for the course.

This brief background to the curriculum's development indicates two things. First is the effort of the Subproject's lead university to assist in the strengthening of the FOA's undergraduate instructional program. OSU has sought to match curriculum to documented needs within Yemen, instruct faculty members in the steps of using a competency-based curriculum, and provide useful examples of fully-developed course outlines.

Second is the newness of the FOA and its curriculum. While in its fifth year of teaching undergraduate course, the competency-based curriculum has been in effect only since 1988/89, i.e., for two academic years. Given this last fact, the FOA and the lead University deserve much praise for having advanced curriculum development so rapidly.

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<sup>12</sup> Ibid.

<sup>13</sup> Herren, R.V. (1988). A Competency-Based Curriculum for the Faculty of Agriculture at Sanaa University: Course Planning Outlines. Corvallis, Oregon: Oregon State University, Faculty of Agriculture Project, Publ. No. 88-1.

<sup>14</sup> Fancher, B.E. and Herren, R.V. (1987).

**b. Current Status**

The FOA Catalogue for 1988 - 89 is the basic written source of information on the curriculum.<sup>15</sup> Half actuality and half "wish list," it makes several assertions that are either inoperative at present or future oriented. The English-language version is a translation from Arabic and contains errors but, whatever its limitations or exaggerations, it is central to discussion of curriculum and instruction. It provides information on faculty goals, the instructional form, the proposed publication of a scientific journal (Yemen Journal of Agricultural Science and Research), the Faculty Council, the six Committees formed by the Faculty Council (reviewed in Section III-B), the administrative staff, the number of faculty, instructors and graduate students in 1988 - 89, and the teaching program. (This is the only FOA Catalogue published to date and will be referred to hereafter as the Catalogue.)

The education program section of the Catalogue provides information on

- Credit requirements to obtain a BS degree in agriculture -- including university requirements, basic sciences requirements and agricultural science requirements,
- The undergraduate education plan, its general program and the approved specializations and
- The Department courses as proposed and planned for the teaching program in the future. As part of that future, it should be incumbent on the Dean and the faculty to establish on a timely basis an annual schedule of courses to be taught in the subsequent academic year and revise the catalogue every three years.

The final section of the Catalogue addresses the Faculty Administrative Rules, 1989-90, and includes three sub-chapters. Chapter One covers departments and specializations. The FOA, according to its Table of Contents and the arrangement of its Undergraduate Education Plan, consists of General Courses, five Departments, and two specializations. At the beginning of the section on the Undergraduate Education Plan (p. 20), however, the Catalogue states:

At present, the Faculty of Agriculture has a general agricultural curriculum with two approved specializations in Field Crops & Pastures and Horticulture & Forestry to start in the first semester, 1989. Specializations will be offered later, depending upon the country's needs and the capabilities of the Faculty in the following areas: Plant Protection, Animal Production, Soil and Water, Ag. Mechanics, Food Science and Technology, Agricultural Economics and Cooperation, and Extension and Rural Development."

The Catalogue further claims (p. 89) that:

"Sana'a University as requested by the Faculty of Agriculture is authorized to give Bachelor Degrees in Agricultural Sciences in one of the following specializations: 1. Agricultural Production, 2. Field Crops and Pasture, 3. Horticulture and Forestry, 4. Plant Protection, 5. Animal Production and Poultry, 6. Soils and Water, 7. Agricultural Mechanization, 8. Food Science and Technology, 9. Extension/and Rural Development, 10. Agricultural Economics and Cooperation. As of 1989, only the first three specializations are operational."

It appears that there is some discrepancy about specializations even within the Catalogue as to their number (two mentioned on p. 21 and three mentioned on p. 89). More importantly, it seems pre-mature, if not contradictory, to name the specializations and at the same time state that the specializations offered will depend on the country's needs and the capabilities of the Faculty.

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<sup>15</sup>Sana'a University, Faculty of Agriculture. (1989). Catalogue, 1988-1989. (Trans. from Arabic). Sana'a YAR.

The actual Departments and Sections (corroborated by the FOA/ET) are as follows:

- **Plant Production:** includes Field Crops and Pastures and Horticulture and Plant Protection.
- **Animal Production:** includes both Animal and Poultry Production.
- **Soil, Water and Agricultural Mechanics:** includes Soil and Water section, as well as Agricultural Mechanics section.
- **Food Science and Technology:** includes areas of Food Technology and Dairy Science.
- **Agricultural Economics and Extension:** includes both Agricultural Economics and Cooperation section and Extension and Rural Development section.

According to current information, as already mentioned, there are two (not three) specializations so far; they are:

- Field Crops; and
- Horticulture.

Both of these specializations fall under the Plant Production Department.

The total number of courses listed for each Department are as follows:

- Plant Production - 69 courses;
- Animal Production - 24 courses;
- Soil, Water and Agricultural Mechanics - 44 courses;
- Food Science and Technology - 24 courses; and
- Agricultural Economics and Extension - 37 courses.

Plant Production is the largest department in terms of courses and faculty (11 out of a total of 19 faculty), and its size appears to have been one of the reasons for the approval of two specializations within this Department.

Chapter Two covers policies of admission, dropping, and dismissal. Two notes of interest are the fact that admittance of students requires them to be "physically fit" (presumably precluding admission of disadvantaged students) and that students be completely free to study (presumably precluding remunerative employment while attending the FOA). Article XII of the Policy states that acceptance of a student is conditional on payment of the study fees determined by the Faculty at the beginning of the academic year. The FOA/ET has no indication that such fees are determined nor that they are imposed on incoming students. Article 15 states that the University Council will authorize the time of starting and ending the academic year. Yet, FOA/ET interviews with FOA faculty members suggest that the Dean is in control of this prerogative for the FOA.

Chapter Three covers policies of programs, academic load and examinations to obtain the Bachelor of Science in Agriculture. The duration of study for the BS lasts for four academic years. The year is divided into two semesters of 17 weeks each including final exams. The student must attend lectures and practical lessons for each course. To take the final exam, a minimum of 75 percent attendance is required. In addition, to obtaining the BS degree the student has to complete successfully the agricultural practical training which includes field visits (two weeks) and field training (four weeks up to two months) in any

relevant organization or institute. This training course equals three credit hours. The University Rector or Vice Rector issues the BS degree following the approval of the Faculty Council.

A review of the Catalogue suggests that the FOA is off to a good start, and its curriculum is rapidly developing. Indeed, our observations complement those of the 1988 CID Early Review Team (Mathis, Burke, and Collum) that the FOA has made considerable progress in developing a curriculum and an effective instructional program.<sup>16</sup>

However, the FOA/ET has formulated a number of observations related to curriculum and instruction that may be of use in the future development of the FOA and the implementation of the USAID Subproject.

#### c. **The Land Grant Model**

The FOA expressed an interest early on to model their institution after a modified version of the Land Grant model.<sup>17</sup> The key word here is "modified" because the Land Grant model's structure in which teaching, research and extension are integrated within Land Grant Universities is not at present, and probably will not be in the future, replicated in Yemen for the simple reason/that operational and budgetary responsibilities for research and extension fall under the Ministry of Agriculture.

The FOA's interest was based on the Land Grant University philosophy "where the leading object shall be, without excluding other scientific or classical studies, to teach branches of learning as are related to agriculture and the mechanical arts. . . ." <sup>18</sup> In principle, the FOA seeks to follow in the steps of the Land Grant Universities by providing applied as well as theoretical instruction, advancing applied research, and providing outreach programs to train extension agents to transfer new knowledge and practices to farmers. In other words, the FOA seeks to adhere to the principles of the Land Grant model even though the same structural organization may not be possible. Related questions with respect to research and extension will be dealt with in detail in the Section E, but its mention at this point has been to underline the FOA's commitment to an applied curriculum philosophy as expressed in the above quote from the Morrill Act of 1862.

#### d. **General and Specialized Training**

Two specializations already exist and discussions with faculty suggest that FOA is moving inexorably toward development of additional specializations. While the former Dean opposed the establishment of specializations, he nevertheless allowed that a limited number might be developed but that these should be optional for students to take only in their third and fourth years.

Discussions with the Directors General of the Agricultural Research Authority (Dhamar), the Southern Highlands Project (Taiz), the Tihama Development Authority (Zabid), and the Tihama Development Authority (Hodeidah), as well as with Ministry of Agriculture officials in Sana'a, suggest that both generalists and specialists in agriculture are needed. The Manpower Development Plan for the TFYP underlines the need for specialized personnel. The FOA/ET recommends that all students should have strong general training during the first two or three years and only then have the option of following a specialization -- if their choice is acceptable to the specific Department.

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<sup>16</sup> Mathis, K.; Burke, M.J.; & Collum, J.L. (1988). Report of Review Team -- CID Early Project Review, Faculty of Agriculture Subproject, Agricultural Development Support Project, Yemen. (Oct. 28-Nov. 4, 1988). Corvallis, OR: Oregon State University.

<sup>17</sup> Fancher, B.E. & Herren, R.V. (1987). *op cit.*

<sup>18</sup> Morrill Land Grant Act, July 2, 1862.

While a limited number of specializations may be desirable, these should be broad-based and targeted at the needs of the Yemeni agricultural sector. The final decision in this matter rests, of course, with SU and the FOA, but we recommend that proposals for specializations should undergo careful scrutiny -- first by a FOA Curriculum and Instruction Committee and then by the FOA Faculty Council and the SU University Council.

#### e. Curriculum Development

The students need a sound background in the sciences -- biological, physical, and social, as well as mathematical and statistical. Their agricultural education should involve applied training -- whether that be in crop physiology or assessing the needs of rural households. At the same time, their education should be reality-based, i.e., directed to the problems, needs, and interests of Yemen, but with some understanding of how Yemen fits into the world picture as an interdependent global participant in development.

Quite appropriately the FOA has arranged for their students to take courses in languages, mathematics, and sciences in other faculties in SU. Originally, FOA students were required to take a course in Principles of Economics in the Faculty of Commerce. The FOA/ET wonders why this stopped. It appears to have been a good precedent. Indeed, the FOA/ET recommends to SU/FOA that students should be required to take social science courses in other faculties in addition to other requirements. "The emphasis on technology generation and diffusion, construed as the primary domain of the physical sciences, has kept the university from enhancing its role in society and seriously weakened its ability to establish a strong political base from which to derive sustenance and support."<sup>19</sup> The truth of this statement can be observed in the FOA's weak links with the MAF and the private sector.

Agriculture is not only a field of biological phenomena, but in fact to be successful in the long-term demands socioeconomic knowledge about the farmer, the farm family, rural youth, and the rural community. The Department of Agricultural Economics and Extension has an important role in developing such knowledge. We recommend that the present Department of Agricultural Economics and Extension develop two courses -- one on rural sociology and another on Yemen Rural Development. The course on Yemen Rural Development should be a general requirement and emphasize the role of women in agricultural and rural development.

As we formulated this recommendation, we learned that a new Yemeni member had been added to the faculty, with a 1990 Ph.D. degree in Agriculture (Rural Sociology) from Cairo University. In line with this development, we further recommend that this Department change its name to the Department of Rural Social Sciences with sections in Agricultural Economics, Rural Sociology, and Agricultural Education and Extension.

There is some concern that the Sana'a University Faculty of Sciences is becoming reluctant to serve the FOA students. According to the Dean of the Faculty of Sciences, the FOA students are not sufficiently prepared and require special courses (i.e., less intensive, less in-depth). It would be unfortunate if FOA students were not able to continue their all-campus study program, especially in the Sciences and expanding into Social Sciences. Indeed, the FOA/ET recommends that the FOA should use courses in other faculties, such as the Social Sciences and Commerce Faculties, as basic courses for the students -- e.g., in sociology, business management, economics, and statistics.

We also think that the three-credit practical training, which involves field visits (two weeks) and field training (four to eight weeks) in a relevant organization or institute<sup>20</sup> should be improved. Practical training should take into account two major aspects of Yemen's agriculture: the first is the importance of smallholders, and the second is the development of the larger private sector and agribusiness. The training program should

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<sup>19</sup>Hansen, G.E. (1990). Beyond the Neoclassical University: Agricultural Higher Education in the Developing World -- An Interpretive Essay. Washington, DC: U.S. Agency for International Development, Program Evaluation Report 20.

<sup>20</sup>See the FOA Catalogue, 1988-89, chap. 3, p. 94.

provide conceptual and analytical development as well as knowledge concerning Yemen's agricultural reality. That is, students should be familiar with this reality as regards both small and larger farms and villages, and regional and national agricultural needs (see Annex F on IAV Moroccan model). Attention to firms processing and marketing agricultural products and supplying inputs to farmers is also needed.

Agricultural competencies are required, but as noted in Section III A, a review of the OSU outlines reveals that there are more competencies than most students (LGUs) learn in four years. While long on skills, the curriculum is short on conceptual and theoretical foundations. We recommend that the competency-based curriculum be modified to ensure that scientific, analytical, and conceptual skills are acquired that prepare students to reason about the problems Yemen confronts in its agricultural and overall development.

Except for the fact that the FOA anticipates in the next few years the return of various participant trainees with fresh Ph.D.s from the United States and Egypt, the number of FOA departments would seem excessive. Under the circumstances, we recommend that the number of departments should be maintained but definitely not increased.

Over time, however, some departments might change their names and orientations. The question is whether departments seeking to establish specializations are planning the necessary development of staff for these areas. A review of the current list of participant trainees (PTs) and the rough draft of the Staff Planning Schedule suggests there is little coordination between department's aspirations and the training and recruitment plans.

Although a "curriculum committee" is referred to in the Brooks end of tour report (1989),<sup>21</sup> there is no mention of such a committee in the Catalogue, and none exists at present. In this regard, we have recommended in Section B.3 that the FOA establish a Curriculum and Instruction Committee made up of faculty members from all departments to review proposals for new courses and proposals for new specializations, as well as all other matters pertaining to teaching programs and instruction.

The Curriculum and Instruction Committee should be responsible for both initiating and staying aware of manpower development surveys and other needs assessments that indicate what Yemen requires in terms of higher education personnel in the agricultural sector, and for shaping the curriculum to meet these needs. This Committee should also assure that students are adequately involved in field orientation, internship training, and generally exposed to Yemen agricultural reality.

The FOA/ET recommends that the Curriculum and Instruction Committee not consider developing a graduate program until the undergraduate program is well established. This recommendation is made since it is rumored that a graduate program is being planned to begin in 1991. We feel that the FOA is not prepared to take on this burden at this time.

We further recommend that the Subproject provide a long-term curriculum and teaching specialist to train and advise staff. This person should energetically assist faculty through workshops and individually to aid in the development of the curriculum to make it more reality-based. The curriculum and teaching specialist should be responsible inter alia for examining how best to integrate the on-going and accumulated research findings and proposals of the Agricultural Research Authority (ARA) into the FOA teaching curriculum.<sup>22</sup> The Associate Dean for Instruction (recommended in Section II B) should be the direct counterpart of this long-term specialist.

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<sup>21</sup> Brooks, R. (1989). End of Tour Report of the Team Leader and Adviser to the Dean, Dec. 1985-Dec. 1986. Corvallis, OR: Oregon State University, Yemen Agricultural Development Support Project, Faculty of Agriculture Project, Project Publ. Series No. 89-1.

<sup>22</sup> Ministry of Agriculture and Fisheries, Agricultural Research Authority. (1988, 1989). Agricultural Research in the Yemen Arab Republic -- Directory of National Research Projects (1988); Vol. 1 (Jan. 1989); Vol. 2 (Sept. 1989). Dhamar & Taiz, YAR.

## 2. The Instructional Farm

As the Catalogue states, "The practical aspects of study for students of the Faculty of Agriculture are not of less significance than the theoretical lessons. Practical lessons are in fact basic requirements to apply theories and gain practical experience. Therefore, it seems unrealistic to establish a Faculty of Agriculture without a farm for agricultural instruction and research."

The Instructional Farm was established in 1986 with USAID funds and consists of approximately 48 ha. of land of which 23 ha. have been developed. The Farm is contiguous to the new facilities being built for the FOA although it is about two miles from the Faculty of Commerce where the FOA is currently housed. The presently utilized area is divided into several blocks: 4.3 ha. for crop production, 3.5 ha. for horticulture, 4.5 ha. for fodder production, 9 ha. for pasture, and the rest of the area is as yet un-utilized or utilized for roads and farm buildings.

The Farm consists of twelve buildings, a water reservoir and a shade house. The buildings include: reception office, crop and horticulture labs, workshop, sheep and goat raising pens, cattle pen, dairy facility, training center for animal production, poultry service labs, poultry houses, poultry feed facility and miscellaneous stores. A more recent building was added to the farm that includes two laboratories -- one for Horticulture and the other for Food Science and Dairy.

Originally laid out to provide instruction in both dry land and irrigated agriculture, the encroachment of the city has now limited the Farm's capability. However, the Farm remains a valuable facility and excellent resource for teaching crop and animal sciences. It may also be used by the other FOA Departments, e.g., for analyzing agricultural production and marketing.

### a. Organization and Use of the Farm

Established by contract in February 1986, with US\$ 2.5 million for the farm itself and approximately US\$ 1 million for equipment to make it operational, the Instructional Farm has since that time run into problems regarding its use, planning and management.

- **The Use of the Farm.** The Farm was originally intended for the purpose of instruction. However, it has become also a production farm. In this regard, there is considerable discussion since the Farm is engaged in selling goods on a retail basis raising questions in the Subproject TL's mind about preparation and inspection standards. The FOA/ET recommends that the Farm sell only to market outlets at going prices and not become bogged down in retail selling which takes precious time away from management tasks. The proceeds from these sales should be placed in the FOA Special Account for use to pay the operating costs of the Instructional Farm, with any surplus going for improvements in instruction.

With respect to the Farm as a vehicle for research, the FOA/ET takes a different tack from previous reports (Brooks, 1989) in that we are convinced that faculty can and should utilize the Farm for carrying out research. We recommend, however, that Farm-based research should be utilized concurrently for the purpose of teaching and, indeed, students should be engaged in assisting with the research -- thus fostering student learning of practical cropping or livestock skills as well as methodological skills.

- **Planning for the Farm.** The Farm requires planning on an annual, midterm, and long-term basis. The Instructional Farm Committee and the faculty in general must become more involved with the Farm Manager and the Subproject's Instructional Farm Adviser, to plot the direction for the Farm. Planning processes should be formalized -- with meetings that establish goals for the short- and long-term, the development of Annual and Five-Year Plans of Work, and mandated adherence to these plans by the Dean and the Instructional Farm Committee.

- **Day-to-day Management of the Farm.** The organization of the Farm is in principle quite excellent as described and charted in the "FOA Farm Management Plan of Important Groups and Individuals" (Annex F). As stated in the Catalogue, an Instructional Farm Committee exists to oversee the management of the Farm. However, interviews suggest that administrative tasks that should be undertaken by the Instructional Farm Committee and the faculty in general are passed on to the Farm Manager and the Farm Adviser so that their planning and practical tasks are continually interrupted.

The FOA/ET judges that there is a heavy administrative burden on the Farm Manager. We recommend two solutions: (1) the Instructional Farm Committee and Departments should be more involved in the administration as well as the instructional use of the farm -- and the faculty in general should take a stronger interest in the Farm and in putting forward recommendations for the Farm's management; and (2) a system of supervision should be put into place to ensure that technicians and laborers actually carry out their assigned duties on the Farm.<sup>23</sup> As an interim measure -- barring a stronger administrative position by the Instructional Farm Committee and the faculty in general -- the current foreman could be given more specific terms of reference and implementing power.

#### **b. The Instructional Farm Committee**

The Instructional Farm Committee consists of the Chairman (currently the Associate Dean) and five faculty members. Two of the members are also Heads of Departments. However, it appears that they are hindered in their task by centralized decision making procedures that frustrate them in their efforts to administer the farm. This decision-override by the Dean causes the Committee members to resort to an attitude of "wringing hands" over things that require action related to the farm.

A meeting of the Instructional Farm Committee was held during the FOA/ET's study, and a member of the team attended the meeting. There was considerable animation and major decisions were taken **in principle**. These decisions were written into the minutes of the meeting, and the Committee gave the impression that they meant to "stick to their guns" over issues raised. We take this attitude as an example of the underlying desire of the faculty to bring about greater decentralization of decision making. Recommendations relative to the Instructional Farm Committee have been made in Section B.

### **3. The Faculty**

#### **a. Faculty Numbers, Salaries and Assistants**

At present there are 20 faculty members, one paid part-time instructor, approximately 16 teaching assistants, and approximately 20 farm technicians (only a few of whom are full-time). Of the full-time faculty members, 12 are expatriates and eight are Yemenis. There are three "types" of expatriates -- (a) those hired with USAID project funds (a total of seven: six Egyptians and one Syrian -- referred to by the Subproject as TCPs, Third Country Professionals), (b) those funded by the Kuwaiti Fund (two Egyptians), and (c) those hired directly by Sana'a University (three Egyptians).

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<sup>23</sup>Technicians fall into three main categories: (a) secondary agricultural technical school graduates, (b) students already attending SU in other faculties, and (c) graduates or faculty at SU working as technicians. These technicians are hired by SU and assigned to departments following departmental review and decisions by the Dean. Sometimes the Dean will make the decision without consulting the department. As a result, these technicians are often not integrated into departments and little supervised, if at all.

There are salary and other differences between those faculty members funded by the USAID Project and the Kuwaiti Fund as compared with those hired by SU. TCPs hired directly through USAID or the Kuwaiti Fund receive salaries based on Kuwaiti dinars and US dollars and these salaries are considerably higher than Sana'a University salaries.

Given the present number of students enrolled in the FOA, the number of current faculty appears insufficient. We note the formula proposed by the Mathis, Burke and Collum (1988) report<sup>24</sup> which assumes a full-time teaching appointment to be 12 credits (or contact hours if laboratory courses are involved) and the typical class size to be 30 students.<sup>25</sup> Their formula would suggest the need for a total at present of 25 faculty members.

This formula, however, assumes that faculty members will not be engaged in research activities nor extensive administrative tasks, as is the case with SU/FOA faculty members, and that class size is only 30, whereas it often reaches 40 or more in the FOA at present. Thus, not counting the difference in class size, we would modify the formula to assume that SU/FOA faculty members carry no more than a six-credit hour course load. In this case, the number of faculty needed would total at least twice as much as the Mathis, Burke and Collum formula, i.e., 50 faculty members. Certainly, the number of FOA faculty members needs to be increased, for purposes of quality but also to enhance the program offerings. The long-range Development Plan envisages an expansion to 78 total faculty by the end of the century, which we think is not excessive if the FOA develops strong research and extension/outreach programs.

The role of teaching assistants and farm technicians is important. Teaching assistants aid professors in conducting the laboratory work and farm technicians are responsible for assisting with instructional farm duties. Both of these categories of assistants are employed and paid by Sana'a University; that is, they are not on fellowships controlled by the faculty. In the case of farm technicians, it appears to be difficult to render them accountable. We recommend that the FOA devise measures by which it can make technicians and assistants accountable for assigned tasks and that this group be used to the fullest extent possible to relieve faculty members of routine laboratory and field practice activities.

#### **b. Faculty development**

Faculty development should be a continuous process serving institutional development. One way to attain this is to review the process by which participant trainees (PTs) are handled at present. Stricter time limits should be placed on PTs. At present there are several PTs who began their training as early as 1982. The FOA/ET recommends that a maximum of five years be allotted PTs to complete their preliminary exams, after which time they should return to Yemen to complete their dissertation research. Their advisers should be funded to supervise their research on one or two occasions. By undertaking their dissertation research in Yemen, the PTs will not only engage themselves in research on Yemen but will contribute to the development of the FOA through creativity and innovation. (See the IAV Moroccan model, Annex G). Also, we recommend that copies of the regular progress reports prepared by the PTs should be promptly submitted to the Subproject TL and FOA administration, if the PTs continue to be handled by another institution.

Faculty development also includes professional improvement through contact with colleagues, access to current research, and staff development opportunities. Faculty should have a strong interest in pursuing their professional development in at least five areas: (a) through access to current periodicals and books in their disciplines, (b) involvement in international meetings to consult with colleagues about their research and to keep abreast of current research activities in general, (c) through in-service training in new technology,

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<sup>24</sup> Mathis, Burke, & Collum (1988), op cit., p. 6-7.

<sup>25</sup> Assuming class size at 30 students, then a faculty member will generate 360 student credit hours each semester or 720 student credit hours per year. The formula then is: number of students (say 600) multiplied by typical class size (say 30) divided by total student credit hours generated per year (say 720).

including equipment relevant to the discipline and computer software systems, and (d) through linkages with local activities of relevance to the FOA's curriculum.

The FOA lacks a modern library. The interim library is limited both in its collection and its management. However, it is assumed that this situation will change with the inauguration of the new facility. A recommendation in this regard will be found in Section III D. A modern library branch in the FOA is essential to the advancement of curriculum and instruction as well as for faculty and student development.

The faculty members require the opportunity to travel at least once a year to international meetings with their colleagues. They should be required to report on these meetings as regards their collegial connections -- paper sessions attended and their value for their teaching assignments and more generally for agricultural development in Yemen.

The faculty members need in-service training. The FOA as a system and the individual faculty members desperately require computer skills: to speed up their administrative record-keeping processes, to enhance their research capabilities, and to serve as role-models to the students. Four computer training courses have been offered by the Subproject but not all faculty have taken advantage of or followed-up with computer utilization. Only the Animal Production Department is utilizing computers systematically. We recommend that intensive development in applied micro-computer utilization be initiated as soon as possible, especially among faculty and administrative staff.

The faculty members need to stay informed of meetings and other activities relevant to their fields of study. Linkages with the Ministry of Agriculture as well as with the bilateral and multilateral organizations with offices in Sana'a should assist them in staying informed.

For example, a recent Conference on Women and Development, organized by the Ministry of Social Affairs in association with/UNFPA and UNESCO, was held in Sana'a, March 1990.<sup>26</sup> Three agriculturally related project proposals were presented at this Conference: (a) an investigative study of rural women's role in the national economy; (b) agricultural extension for rural women; and (c) hand tools for rural women in Sana'a Governorate. It was the MAF that presented the idea of a survey of rural women's role in the national economy. FOA faculty members should make a point of staying aware of such activities. They should seek to attend such agriculturally related conferences and engage themselves and their students insofar as possible in follow-up activities.

With respect to linkages, it should be noted that the Animal Production Department is setting an important precedent in the FOA. It issues a newsletter in Arabic and English, edited by the Associate Dean, the Department Head, and a recently returned Yemeni faculty member. The newsletter deals with the applied aspects of animal production and includes papers prepared by scientists and specialists from both ARA and the private sector.

In addition, the Animal Production Department's faculty members participate in meetings of animal scientists with different training levels (BS, MS, Ph.D.) who are working in various agencies and organizations across the country. This forum meets regularly to discuss questions related to animal production in Yemen and is at a stage where it may take the form of an institutionalized body such as a "national society of animal production." This idea has in fact received favorable attention from faculty members, officials and researchers in ARA, and senior officials in the Ministry of Agriculture. Thus, it may be seen that there are certain areas in which excellent progress is being made to develop the FOA into a leadership position for agricultural development in Yemen. These initiatives by the Animal Production Department should serve as a model for other FOA Departments.

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<sup>26</sup> Lackner, H. (1990). Rural Development for 8/in Khawlan. Sana'a: Ministry of Agriculture and Fisheries in cooperation with the Food and Agriculture Organization of the United Nations, doc. YEM/88/004. Sana'a: FAO.

**c. Faculty support**

Faculty members need transportation, laboratory, and administrative support. They are in need of transportation vehicles to be available for them and their students to travel back and forth from the Instructional Farm (which will be closer to the FOA once the new facilities are completed) and also for field trips. At an earlier stage of FOA's development, the Project purchased and also managed vehicles for the FOA, but within the past year these vehicles have been transferred to SU for management, and the faculty complain that the vehicles are no longer as available when they need them.

Lack of equipment is a constant complaint by the faculty. Although Project staff differentiate equipment for teaching from high-grade research equipment, faculty claim that even the teaching equipment is inadequate. It appears that lack of equipment, along with the maintenance of equipment, are major problems related to curriculum and instruction. Hopefully, these will be resolved as planned with the opening of the new facilities (Section III D).

Administrative support will be addressed in Section III D of this report, but it merits note here that Departments are currently responsible for matriculating students and keeping records on them. There is no tracking of graduates, no alumni association, and faculty must spend considerable time on "administrivia" that should be carried out by the FOA Office of Student Affairs and administrative staff, as recommended in Section III B.

**d. The Yemeni Faculty**

The FOA began with six Yemeni staff--the Dean, the Associate Dean and four faculty -- but depended to a considerable extent on expatriate faculty and curriculum. It still depends in large part upon expatriate faculty. There are currently eight Yemeni faculty, two of whom are the Dean and the Associate Dean.

There is a feeling among Yemeni faculty that there are too many expatriates (12) as compared with Yemenis (8). Some of the Yemeni faculty feel that there should be more Yemenis in control of Department goals and activities. All five Department Heads are expatriates. In this regard, in Section B.3 we recommend that as soon as feasible Yemeni professors should be appointed to head all FOA Departments.

USAID has allocated funds for 24 FOA faculty trainees students to study abroad. Thirteen have already been selected, two of whom now form part of FOA's 20 full-time faculty. Of those remaining, 11 are currently in the United States and two in Egypt. The other nine candidates are currently in the selection process. When these Yemenis return as professors, the faculty will no doubt change and presumably so will the instructional methods. Two notes of interest regarding PT selection are (a) the inclusion of one female in the participant training program studying for the Ph.D. in vegetable production and (b) the selection of another female scheduled to go abroad in the near future to study animal science.

A number of expatriates on the faculty at present are not engaged in developmental activities, or at best are in need of training in modern teaching methods, computer skills, and systems management. While several expatriates are excellent, even outstanding, others are either on the verge of retirement or limited in their commitment to developing an applied curriculum relevant to Yemen's needs. We recommend the following change in policy: all technical assistance under the subproject (long-term and short-term) should be provided for institutional development purposes and should be based on terms of reference that clearly indicate the advisory/developmental objectives to be achieved. If, in addition, expatriate professors continue to be needed to handle the teaching load, some may be supported by the Subproject but will be hired by Sana'a University under their own rules and regulations.<sup>27</sup>

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<sup>27</sup> A transition period may be required to fully implement this policy to fulfill commitments to existing TCPs.

Parallel to the above action, additional faculty recruitment of Yemenis from both within and living outside Yemen seems appropriate. Indeed the current faculty is understaffed, and there appear to be available and qualified Yemenis who might serve to fill the ranks. It is recommended that the Subproject initiate recruitment of qualified Yemeni faculty from within the country and from abroad. This will also increase the SU financial support for the FOA since Yemeni professors are appointed on the SU budget.

#### **4. Students**

##### **a. Enrollment policy**

To date, there has been no restriction on enrollment at Sana'a University as the Constitution has mandated free education. The former Minister of Agriculture suggested in an interview with the FOA/ET that the new Minister of Higher Education and Research (who will become responsible for Sana'a University) may place limits on the number of students entering all faculties depending on national manpower needs. While this is a possibility, other interviewees think there will be no restriction on enrollments.

If the current situation prevails, the FOA will have to take steps to control enrollment. An obvious measure is to raise the standards for entrance. Indeed, faculty complain that too many students entering the FOA require remedial preparation. If such is the case, and the standards are not raised, then remedial courses in the basics of the Arabic language, mathematics, and the sciences should be instituted at SU and required for admission to the FOA.

##### **b. Number of students**

When classes began in 1984/85, the FOA received 15 students in the first semester and 60 in the second. But, according to the Registrar the actual numbers total 12 and 54 from those first two semesters, accounting for those who transferred (or dropped-out). The number of students enrolling in the FOA has tended to increase but may be reaching a plateau. The following Table 1 is based on numbers provided by the Registrar on students enrolled since 1984-85.

In Table 1<sup>28</sup> the percentage of females enrolled equals 4.3 percent. Also in Table 1 two additional facts are notable: (a) that in 1986 the FOA decided to accept students only at the beginning of each academic year, and (b) that the number of students who transferred out of the FOA after enrollment must be subtracted from the total enrolled and also the number of students graduating must also be subtracted from the total enrolled in order to ascertain the current number of students.

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<sup>28</sup> Both Tables 1 and 2 are based on the hand-written charts provided by the Student Affairs Adviser who is also the principal officer in charge of registration.

**NUMBER OF STUDENTS ENROLLED SINCE 1984-85**

<b>YEAR</b>	<b>MALE</b>	<b>FEMALE</b>	<b>TOTAL</b>	<b>TRANSFERRED</b>
Sep. '84	11	1	12	--
Feb. '85	53	1	54	9
Sep. '85	69	5	74	10
Feb. '86	49	2	51	4
Sep. '86	83	--	83	6
Sep. '87	140	7	147	13
Sep. '88	149	10	159	18
Sep. '89	139	5	144	1
<b>Total</b>	<b>693</b>	<b>31</b>	<b>724</b>	<b>61</b>

**TABLE 1**

The number of graduates since 1988 until the present is charted in the following Table 2.

NUMBER OF GRADUATES 1988 - JUNE 1990			
YEAR	MALE	FEMALE	TOTAL
May '88	4	1	5
Jan. '89	15	1	16
May '89	10	1	11
Sep. '89	15	2	17
Feb. '90	16	1	17
Mar. '90	13	--	13
TOTAL	73	6	79

TABLE 2

Two reasons account for the lack of uniformity of graduation months in Table 2. In the beginning years, students were admitted during both Fall and Spring semesters. Also, some students have finished earlier or later than others and special graduation ceremonies have been held. From 1990 onwards, there will be only one graduation ceremony, in June of each year. Of the total number of graduates, female students make up 7.6 percent.

If we subtract from the 724 total number of students who have enrolled (see Table 1), the 61 who transferred (also see Table 1) and the 79 who have graduated (see Table 2), then we find that there are 584 on-going students in the program at the present time. Presumably some of these students (approximately 75) will graduate in June 1990.

The total enrollment at the end of the 1989/90 academic year is somewhat more than planned in the Subproject paper but appears for the moment to be within the bounds of what the new facilities can accommodate. The number of entering students has implications for the faculty, curriculum, materials, and equipment.

**c. Female students and women in development**

The curriculum should take more account of women in development, especially in agricultural development and in the institutions that serve agriculture. In this regard, we have recommended above, under Curriculum Development, that the Department of Agricultural Economics and Extension develop a general education course on "Yemeni Rural Development" underlining the importance of the role of women in agricultural and rural development.

Also, as mentioned above, students should be kept informed of such developments as the Ministry of Agriculture's interest to study the role of women in the national economy, and that a recent conference on Women and Development took place in Sana'a (ref. Section III C.b). The proposals put forward at the Conference might serve as the topics for insertion into the general curriculum. The number of female students in the program at the present time. Presumably some of these students (approximately 75) will graduate in June 1990.

The number of students who have transferred or graduated out of the FOA has not been disaggregated according to males and females but, as mentioned, gross figures indicate that females make up about 4.3 percent of the total student body. The total number of female students who enrolled in the FOA in 1989 - 90 was 31, as compared with 693 male students. Part of this discrepancy is due to the conservative cultural norms in North Yemen.

It is claimed, in contrast, that some 20 percent of the students in the Faculty of Agriculture in Aden are females. With the country's unification some, if not many, of these female students may wish to transfer to the FOA in Sana'a. If this happens, the character of the FOA may change with females taking a more prominent place in the study program. The implications of such change for the curriculum are obvious in that courses on women's roles in agricultural and rural development should be more prominently emphasized.

There is some criticism of the female students, however, to the effect that when interned in field organizations, such as the Rural Development Authorities and other Ministry of Agriculture projects, they resist going into the field, i.e., into the villages to communicate with women on agricultural and household development. Sociocultural attitudes appear to constrain female students, although further research is needed to ascertain the effect that traditional attitudes may have on their grades and work behavior.

As already mentioned, the SU is funding one female participant trainee studying for the Ph.D. in vegetable production and the FOA with Subproject support, has selected another who will go abroad in the near future to study animal science. Government-wide, some 11 percent of newly scheduled graduate participant trainees, competitively selected (under Law 19) for study abroad, are females. It is interesting to note that their study plans are toward the sciences and not toward household management or home economics.

**d. FOA/ET student survey**

The FOA/ET developed a brief student survey questionnaire in early June to acquire first-hand information about (a) students' origins, (b) whether the FOA was their first, second or third/choice of faculty; (c) what are their academic objectives; and (d) what are their employment goals. The questionnaire was distributed to 100 students from different class levels in the FOA. Some 42 questionnaires were returned. From these the following information was obtained.

1.	Origin of students:	Urban - 24 Rural - 76
2.	Choice of FOA:	1st - 57.5% 2nd - 27.5% 3rd - 15 %

- |    |                      |                  |         |
|----|----------------------|------------------|---------|
| 3. | Academic objectives: | Generalists      | - 7%    |
|    |                      | Specialized      | - 93%   |
|    |                      | of which:        |         |
|    |                      | Horticulture     | - 41.5% |
|    |                      | Crop Production- | 19.5%   |
|    |                      | Animal Science   | - 12 %  |
|    |                      | Ag Economics     | - 10 %  |
|    |                      | Ag Engineering   | - 5 %   |
|    |                      | Food Tech.       | - 2.5%  |
|    |                      | Irrigation       | - 2.5%  |
| 4. | Employment goal:     | Agriculture      | - 85%   |
|    |                      | Other sectors    | - 10%   |
|    |                      | Not defined      | - 5%    |

Of primary interest to the FOA/ET is that the majority of students seek to specialize in one or another area of agriculture.<sup>29</sup> Only 7 percent desire to be generalists in agriculture while the great majority (93 percent) seek to specialize in one or another of the seven areas mentioned. Of these areas of interest horticulture is far and away the most popular branch of study, with crop production, animal science, and agricultural economics being of considerable interest. In other areas of great concern to Yemen agricultural development -- Agricultural Engineering, Food Technology and Irrigation -- there was less interest expressed by those students who returned completed questionnaires.

While more than three-fourths of the students come from rural areas, it should be noted that all of them have attended secondary schools in urban areas before entering the FOA. It is important to note that 57.5 percent consider FOA to be their first choice. FOA as a second or third choice means that they were unable to enter into one or more faculties of their choice but had to settle for the FAO.

**e. FOA graduates**

There are -- prior to June 1990 graduation -- some 79 graduates of the FOA, according to the Registrar's hand-written records. There is no tracking of these students to ascertain their employment patterns. Such tracking might serve at a later date for analyzing rates of return on investment. Likewise, an FOA alumni association is lacking to keep track and continue contact with the graduates as their careers develop. (The recommendation in this regard will be found under Section III D, Administrative Support.)

**5. Summary of Recommendations**

The Curriculum and Instruction Section recommendations are organized under the headings of curriculum and students, the instructional farm, and the faculty.

**a. Curriculum and Students**

- The Dean and the faculty members should establish on a timely basis an annual schedule of courses to be taught in the subsequent academic year and revise the Catalogue every third year.
- FOA students should be required to take social science courses in addition to other requirements.

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<sup>29</sup> Among those who chose agriculture as their employment goal, it is interesting to note that one stated his goal to become Minister of Agriculture and another to become Dean of FOA.

- Sana'a University should encourage other faculties, such as the Social Sciences and Commerce Faculty, to open their basic courses to students outside their Departments.
- If standards are not raised in the FOA, then remedial courses in the basics of the Arabic language, mathematics, and the sciences should be instituted at SU and required for admission to the FOA.
- The competency-based curriculum should be modified to ensure that scientific and analytical skills are acquired that prepare students to reason about the problems Yemen confronts.
- Practical training should be improved to take into account two major aspects of Yemen's agriculture: the first is the importance of smallholders, and the second is the development of the larger private sector including agribusiness. The training program should provide conceptual and analytical development as well as knowledge concerning Yemen's agricultural reality. That is, students should be familiar with this reality as regards both small and larger farms, villages, regional and national agricultural needs.
- All students should have strong general training during the first two or three years and only then have the option of following a specialization -- if their choice is acceptable to the specific Department.
- To deal with the question of specialization and other curriculum matters, the FOA should establish a Curriculum and Instruction Committee made up of faculty members from all Departments to review proposals for new courses and proposals for new specializations.
- Proposals for specializations should undergo careful scrutiny -- first by the FOA Curriculum and Instruction Committee and then by the FOA Faculty council SU University Council.
- The number of Departments and Sections should be maintained but definitely not increased.
- The present Department of Agricultural Economics and Extension should develop two courses -- one on rural sociology and another on Yemen Rural Development. The course on Yemen Rural Development should be a general requirement and emphasize the role of women in agricultural and rural development.
- The Department of Agricultural Economics and Extension should change its name to Department of Rural Social Sciences with sections in Agricultural Economics, Rural Sociology, and Agricultural Education and Extension. Recruitment to strengthen this Department should be initiated.
- The FOA and its Curriculum and Instruction Committee should not consider developing a graduate program until the undergraduate program is well established. This recommendation is made since it is rumored that a graduate program is being planned to begin in 1991. We feel that the FOA is not prepared to take on this burden at this time.
- The Subproject should provide a long-term curriculum and teaching specialist to train and advise the faculty in curriculum that is reality-based (not just competency-based) and foster modern instructional methods that integrate the theoretical applied approaches.

#### **Instructional Farm**

- The Farm should sell only to market outlets at going prices and not become bogged down in retail selling which takes precious time away from management tasks. The proceeds from these sales should be placed in the FOA Special Account to pay the operation costs of the Instructional Farm with any surplus going to improve instruction. The Curriculum/ Instruction Committee should handle the account in accordance with SU fiscal regulation.

- Farm-based research should be utilized concurrently for the purpose of teaching and students should be engaged in assisting with research -- thus fostering student learning of practical cropping or livestock skills as well as methodological skills.
- The Instructional Farm Committee and departments should be more involved in the administration of the farm--and the faculty in general should take a stronger interest in the Farm and in putting forward recommendations for the Farm's management.
- A system of supervision should be put into place to ensure that farm technicians actually carry out their assigned duties on the Farm. SU, the FOA, and individual faculty members should work together on this matter.
- The Farm Foreman should be given more specific terms of reference and implementing power, especially with regard to supervision of laborers.

**c. Faculty**

- A maximum of five years should be allotted PTs to complete their preliminary exams, after which they should return to Yemen to complete their dissertation research. Their advisers should be funded to supervise their research on at least two occasions.
- Copies of the regular progress reports of the PTs should be promptly submitted to the Subproject TL and FOA administration.
- Intensive development in applied micro-computer utilization emphasizing Arabic software should be initiated as soon as possible, especially among faculty members and administrative staff.
- Technical assistance under the subproject should be used only for persons provided for institutional development purposes. The term of reference for this TA should clearly show the advisory/developmental objectives to be achieved.
- If expatriate professors are required to handle the teaching load and are supported by Subproject funds, they should be employed by Sana'a University and supervised by the Dean following the standard rules and regulations of SU.
- Additional recruitment should be initiated to bring in more qualified Yemeni faculty within the country and abroad.

**D. Support Services**

**1. The New Facilities**

A modern complex of 10 buildings is under construction on the S.U. campus, contiguous to the Instructional Farm. The buildings include: Administration, Library, Mosque, Lecture Hall, two Laboratory buildings, a Classroom building, a Cafeteria, Greenhouse and Agricultural Mechanics building (which includes a Food Processing Plant). While USAID funds the cost of the Consulting Engineer (Stanley Consultants, Inc.), the costs of the facilities and furnishings will be funded as follows:

Foreign Currency (US\$):

Islamic Development Bank	US\$ 6,264,321.39
Saudi Fund for Development	US\$ 5,555,152.93

**Riyals:**

Saudi Fund for Development	R 19,897,448.64
Republic of Yemen	R 42,282,078.22

The FOA will continue to function within the Faculty of Commerce until the new facilities under construction are completed. The scheduled date of completion for these new facilities is August 1991 -- approximately one year from the time of this report.

According to the Consulting Engineer, the facilities are designed to meet the demand of approximately 600 students, but can accommodate upwards of 800-1000. (He also informed the FOA/ET that the lecture hall is capable of sustaining a third story.)

In the coming academic 1990-91 year, it may be assumed that the student body will increase by at least another 150 enrollees, but at the same time approximately 120 are due to graduate, which would mean a small total increase in the number of students. If annual admissions remain at the current level of about 150, there should be no foreseeable problem as regards the new facilities.

The only foreseeable problem may be with maintenance of the physical plant and maintenance and renewal of equipment for students. These are discussed later.

## **2. Library**

The present library is essentially a reading room with few books and fewer periodicals, only some of which are current. The new facility provides a separate library building. This new building will require staffing and maintenance, as well a recurrent fund for the purchase of books and periodicals. The FOA plans to staff the Library. However, the proposed librarian was only selected in 1990 and then hired as a teaching assistant in charge of the FOA branch Library. He is presently studying at YALI (Yemen-American Language Institute), and from there is scheduled to go to the United States to pursue a Master of Library Science.<sup>30</sup> While it is also foreseen that a TDY from OSU will serve as Librarian, this will not resolve the immediate problem of building up the library facilities in Arabic, nor ensure a smooth transition between the TDY and the librarian-in-training. Therefore, it is recommended that the Subproject hire a locally available, long-term (2-3 years), librarian who possesses Arabic and English language skills, as well as documentation and computer skills, and is capable of assessing needs of the faculty and students for research journals and related FOA study materials.

A modern FOA library needs to be developed with computerized networks linked with (a) the FOA administration and (b) other library information systems. The librarian/documentalist should work closely with computer experts in developing the FOA library branch.

## **3. Administrative Support**

There are six administrative staff in the faculty administrative system: a controller, a student affairs officer, two secretaries (one male, one female), an accountant, and a storekeeper/cashier. A third secretary (female) has been hired by the Subproject to serve the departments. Interviews with these administrative staff reveal that most are not being utilized for the functions they are intended to carry out. Accordingly, they are poorly motivated. The problem appears to be due in large part to the authoritative, centralized style that currently dominates the FOA decision-making processes.

The administrative staff require training and reconstitution of their responsibilities by the Dean, thus encouraging them to advance themselves and their work. As indicated in Section II b, we recommend that systematic and recurrent training be provided to the administrative staff in a variety of skills, e.g., systems

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<sup>30</sup> Faculty of Agriculture Annual Work Plan FY 1990, p. 16.

management processes, computer skills, and typing. The FOA should be a learning environment--for administrative staff as well as students and faculty.

As mentioned in Section C.3, under Faculty Support, there is no tracking of students nor any plan to do so. Consequently, no alumni association exists. The Academic Adviser, who is the senior officer responsible for registration, lacks computer skills and does not presently understand the value of computerized systems. Matriculation of students is being handled by the departments which puts a heavy burden on their time. It is recommended that the Student Affairs office include the registrar's function and be responsible for student records and maintaining connections with former students. But before this can happen, a registrar with an interest in and knowledge of computer systems must be assigned to this position.

At present, faculty are devoting too much time to tasks which can and should be implemented by specialized administrative staff. The FOA/ET notes that a Peace Corps volunteer in 1988 developed an automated registration system for the enrollment of students. We wonder what happened to the automated system?! Whatever the case, we recommend that the Subproject provide a short-term systems development specialist, if administrative staff can be prepared motivationally to undertake a computerized approach to systems development and if the work can be undertaken in Arabic.

#### **4. Physical Plant**

Physical plant maintenance is an observable problem. The Faculty of Commerce where the FOA is currently housed is an example of poor maintenance. The only effort made is sweeping, and even in this case, the yards are littered with discarded plastic and cardboard eating containers. Only the inside of the building is swept. It would appear that the physical plant crew is made up entirely of women whose main task is to keep the dust from accumulating.

Maintenance involves a recurrent cost; this should be foreseen by SU and the Subproject, at least for the period 1991 - 1996. Otherwise, the splendid buildings currently under construction to house the FOA will fall into disrepair within a short period of time. The FOA staff should take major responsibility for observing and reporting problems of maintenance. FOA has an opportunity to serve as a role model to Sana'a University in this particularly acute problem area.

It was mentioned by both the Consulting Engineer and the Dean that a contracting firm would be hired to ensure maintenance. If affordable on a recurrent basis, then this would presumably resolve the problem.

#### **5. Equipment Maintenance**

The maintenance of laboratory equipment needs to be foreseen. We recommend that each department in FOA should assign TAs and farm technicians the task of storage and maintenance of, respectively, classroom and farm laboratory equipment. Faculty within each Department should supervise and regularly monitor maintenance efforts. Technicians and assistants need to be trained during 1990/91 to take over the maintenance of the large amount of equipment now under procurement.

#### **6. Computer Services**

##### **a. The Present Computer Center**

The new computer facility will (hopefully) be available in August 1991, but there are certain procedures and tendencies that prevail within the present computer center that deserve attention. First, the Computer Center is almost always locked and the team's observation is that almost nobody utilizes the Center's room-full of computers. There appears to be no training being provided and the computers simply sit. This

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<sup>31</sup>The Peace Corp volunteer was also given responsibility for management of the FOA Computer Center and instructed faculty in a micro-computer workshop.

may be due in part to the door being locked, since nobody is in the room to maintain security.<sup>32</sup> And yet, numerous students mill around in the halls without any particular tasks to perform. As with many other situations in the FOA, there is a need for people to know how to make something from nothing and accomplish things with nothing. Nothing, in this case, being the large number of available students -- including TAs, but also regular students who are left without responsibilities from which they might learn certain managerial skills.

#### **b. The New Computer Facility**

The new computer facility will require Arabic speaking staff who can develop computer networks, train faculty and staff in new computer skills, and who are available to lead workshops for interested students. The computer has already revolutionized the ways and the speed with which we do things. It is an essential tool in modern agricultural development. The FOA/ET recommends that computers be utilized, made available to those who are interested, and indeed their use encouraged. Also, training must be on-going and in Arabic as new software and techniques become available.

The FOA/ET recommends that the FOA hire a local Arabic-speaking computer expert with skills in systems analysis and management as well as computer training skills in basic software programs. This expert should be responsible for: (a) setting up hands-on training courses on a regular basis for both faculty and administrative assistants; (b) assisting the Registrar and Department Heads in developing enrollment records for the FOA, establishing data bases on current and graduated students; and (c) analyzing and establishing appropriate systems management for networking the activities and/schedules of the faculty, especially the curriculum adviser.

The Animal Science Department seems to be more advanced in the use of computers for purposes of administration and student teaching. This Department might take the lead meanwhile in assisting other departments to develop their computer capabilities.

The computer facility will be allotted considerable space in the classroom building that is under construction. We further recommend that the FOA hire, in addition to a computer specialist at least two computer student aides who can train, monitor, and assist students and faculty in the use of computers. In the final analysis, it is this manpower and their knowledge of computer applications that will make the new facilities operate efficiently and effectively.

### **7. Summary of Recommendations**

The support services recommendations are organized under the headings in the section: library, administrative support, physical plant, equipment maintenance, and computer services.

#### **a. Library**

- The librarian/documentalist should work closely with computer experts in developing the FOA library branch.
- The Subproject should hire a locally available, short-term librarian/documentalist who possesses Arabic and English language skills, documentation and computer skills, and is capable of assessing needs of the faculty and students for research journals and related FOA study materials.

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<sup>32</sup> Indeed, the computers are not only locked within the Center but then each is locked within separate cabinets. There is obviously a problem which has to be resolved between ensuring security and promoting utilization of these computers.

**b. Administrative Support**

- Systematic and recurrent training should be provided to the administrative staff in a variety of skills, e.g., systems management processes, computer skills, and typing. The FOA should be a learning environment -- for administrative staff as well as students and faculty.
- The Student Affairs office should incorporate the registrar's function and be responsible for student records, registration, and maintaining connections with former students.
- The Subproject should provide, as an interim measure, a short-term computer specialist if administrative staff can be prepared motivationally to undertake a computerized approach to administrative management and if the training can be done in Arabic.

**c. Physical plant**

- The FOA staff should take major responsibility in observing and reporting problems of maintenance. FOA has an opportunity to serve as a role model to Sana'a University in this problem area. SU should be encouraged to execute the maintenance contract.

**d. Equipment maintenance**

- Each Department in FOA should assign TAs and farm technicians the task of storage and maintenance of classroom and farm laboratory equipment.
- Training of technicians and assistants to handle equipment maintenance should be carried out during 1990/91.
- Faculty should supervise and regularly monitor equipment maintenance efforts.

**e. Computer services**

- Computers should be utilized, made available to those who are interested, and indeed their use encouraged.
- Training in Arabic should be on-going as new software and techniques emerge.
- The FOA should hire a local Arabic-speaking computer expert with skills in systems analysis and management as well as computer training skills in basic software programs.
- The FOA should also hire at least two student computer aides who can train, monitor, and assist students and faculty in the use of computers.

**E. Research and Extension**

**1. FOA Research and Extension as Envisioned in the Subproject Paper**

As a component of the Title XII Agricultural Development Support Project the FOA Subproject paper (February 1984) makes direct reference to research and extension activities. The paper envisions that the FOA will strengthen research on priority agricultural and rural development issues, support those agencies active in developing and extending technology to producers, and facilitate improved extension and demonstration linkages to local producers. Research is also vital to enhance the teaching and professional expertise of faculty members.

The section on "Research Linkages" proposes that linkages be established at both the administrative level (deans, department heads, director generals) and operational levels (faculty members, experimental farm directors, and technical institute directors). Also emphasis is placed on "linkages to impact farm households"

and it is suggested that the complexity of this linkage scheme will require the establishment of an Extension Coordinating Committee consisting of "representatives of the Dean, FOA, Minister of Education, Minister of Agriculture, major donor organizations, and three local officials to represent farmers".

The Statement of Work discusses five major elements that should exist by the end of A.I.D.'s contribution to the FOA. Among these is continuing collaboration between the FOA, the MAF, the Ministry of Education (MOE), ARA, private agencies and producers on 1) research priorities; 2) extension; 3) curriculum development for BS -level programs; 4) other formal training programs (workshops, seminars, etc; and 5) in-service training. To accomplish these major elements, the Subproject is structured in a modular fashion which includes Technical Module 4 (TM4) -- Research and Extension. The objective of this module is to assist the FOA in developing a program of research and extension/outreach activities relevant to Yemen's agricultural development needs and consistent with its primary focus on instructional quality.

## **2. Status of FOA Research**

Only recently has research received much attention as an FOA function. The project TL deserves credit for this recent effort. Past Subproject documents, including the end-of-tour report of the previous TL, make scant reference to research. Understandably, the first priority of the subproject and the FOA has been participant training and establishment of the teaching program. While the teaching program and faculty formation will require continuing attention, it is now time to direct increased efforts to research.

The 1990 workplan clearly states the importance of research to the overall quality of instruction, faculty improvement, FOA public credibility and support to the agricultural community. Position descriptions for Third Country Professionals (TCPs) funded by the Subproject include faculty responsibilities in research and outreach. Success in fulfilling these responsibilities will be part of their performance evaluations. It is important that this initiative be replicated by the FOA administration with all faculty. At present, those faculty not funded by the project are lacking position descriptions that specify any responsibilities beyond teaching a certain number of courses.

As recommended in III B, detailed position descriptions and evaluations based on a workplan that included teaching, research and extension are needed to distinguish faculty performance and provide rewards accordingly. While this matter is important to all faculty, it is particularly important to young Yemeni faculty who have recently returned from Ph.D. programs in the United States. These faculty have expectations based on their educational preparation that include research.<sup>33</sup> Since Sana'a University requires at least five refereed publications for promotion in academic rank, young faculty have no choice but to try to do some research. However, until recently there has been little support from the Subproject for research and there is still little, if any, support from the FOA administration. Noteworthy are plans for the FOA to publish a Journal of Agricultural Science and Research.

Given the extensive administrative responsibilities of the Subproject TL, it is unrealistic to expect him to provide as much leadership to research as is required. Thus, consideration should be given to TDY technical assistance for research development. Department heads and faculty should develop departmental research goals within which faculty research programs could operate. This task would, of course, be greatly facilitated by an FOA mission statement outlining research objectives. At present, there is a faculty member who has the title of Research and Training Coordinator, but there has apparently been little leadership or coordination provided. A senior faculty member with a good record of research who could serve as Research Coordinator should be selected.

Faculty members need to conduct research so they stay current with new scientific advancements. While this can be accomplished to some extent through research journals and professional meetings, it is important that

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<sup>33</sup> According to reported accomplishments (1990 Work Plan), faculty published 17 papers in conference proceedings and scientific journals in 1989.

faculty have their own research programs and thus continue to develop agricultural knowledge and expertise in their fields. Good teaching requires active research interests by the faculty members.

A recent internal FOA evaluation<sup>34</sup> raises the issue of faculty research on the instructional farm. The opinion expressed is that the farm should be used only for instruction because the "relatively small farm size and large number of students, combined with limited budget support, dictate such a policy". This assessment seems to imply that research and instruction at the farm are incompatible. This is clearly not the case, and every effort should be made to use research for instructional purposes. In some cases faculty research may not be oriented towards instruction, but instead have as its primary purpose the advancement of knowledge and generation of technology for improving Yemeni agriculture. Research of this nature is also important and should be encouraged. A task for the Research Coordinator mentioned above would be to review of research proposed on the farm with the Farm Committee. Criteria for farm research should be developed and communicated to faculty.

Faculty research also depends on access to other resources such as laboratory equipment and supplies, reference materials, computers, labor, travel and per diem funds, planting materials and experimental animals, among others. In this respect, it is important to remember that the new FAO buildings should be ready for use in about a year; this will be a great improvement over the current borrowed facilities. Computer facilities appear adequate and will soon improve greatly, although with few exceptions faculty are not making much use of them.

Funding of faculty research is an important consideration. As noted above, the Subproject has recently allocated funds for faculty research grants. FOA departments received a departmental budget that can be used for research as well as other activities. Also, US\$ 20,000 is available to provide faculty summer employment on approved research projects. There are also funds allocated to provide, research equipment as required, maintain the computer center for data analysis, support participant trainees thesis research in Yemen, and provide opportunities for Yemeni faculty to improve their research (or extension) skills through faculty development programs. These efforts are all valuable and should be vigorously pursued in 1990 and continued, even expanded, in the future. The problem, however, with use of Subproject funds to directly support research by faculty members is that the support will end with the Subproject. A better strategy would be to use Subproject funds as "seed money" to encourage faculty members to seek outside support from ARA and other government agencies.

Research proposals were solicited recently from FOA members for general Subproject funding. Sixteen proposals were received of which nine have been funded. These proposals were reviewed by a committee consisting of the Subproject TL and the FOA department heads. Priority was given to Yemeni faculty and relevance to Yemeni agriculture in evaluating the proposals. In the future, proposals should also be reviewed by ARA to insure that they are consistent with established research priorities.<sup>35</sup>

Support for faculty research, outside of that provided by the Subproject, is a concern and relates to sustainability of research after project termination. Possibilities include contracts for faculty research services from the private sector, international donors and other sources, and provision of funds from government agencies, especially ARA. The Vice-Rector of Sana'a University, informed the FOA/ET that the university was not in a financial position to provide much additional support to the FOA. He noted that the FOA was fortunate to have the production capability of the instructional farm to support some of its activities. He also suggested that FOA faculty pursue research contracts with private sector enterprises, and gave as example the Engineering faculty which has been very active in publicizing their services with private firms.

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<sup>34</sup> CID Early Project Review, 1988, p.22.

<sup>35</sup> It is noteworthy that ARA calculates that it would require 30 additional staff members in order to implement its proposed research projects. This is a "research vacuum" that could be partially filled by FOA faculty and even participant trainee's thesis research.

Some FOA departments have been providing services to various clients, both private and public notably the Animal Science department which should serve as a model for others.

An expected output for 1990 is for the FOA to participate in the ARA annual research review; this is critical so that FOA research priorities are consistent with ARA's and to facilitate collaboration on research projects. The ARA Director General said that the institution would provide research support to the FOA as long as it is in line with established priorities. Faculty should definitely be encouraged to actively seek outside funding for research from private and public sources. This might be accomplished by making "grantsmanship" a factor in faculty performance evaluations. Consideration should also be given to an annual awards for research excellence and the best research paper.

It is important that a research program be considered for all FOA faculty members. However, there may be some faculty who are better prepared and able to contribute more through outreach activities than research. The next years of the project are critical to establishing a research capability in the FOA that can serve Yemen agricultural development. This should be a priority goal of the FOA and the Subproject.

### 3. The Status of FOA Outreach

If FOA research is nascent then its outreach program could be described as embryonic. As with research, there is no outreach mission statement. As a result, there is no coordinated outreach program but rather a few *ad hoc* activities. As observed above, an expected output of the research and outreach module for 1990 is mission statements for both of these areas. Immediate attention should be given to this task. Departmental and faculty outreach goals and workplans should be specified.

Another planned output for 1990 is an in-service training seminar for agricultural extension workers. This in-service training is to be coordinated with the Ministry under the direction of the FOA Agricultural Economics and Extension department. Two other workshops for extension agents have been held in the past year. These workshops have received mixed reviews. One government official described the workshops as "mainly for propaganda purposes." He thought that the training had been too theoretical and was not relevant to the "real" agricultural needs of the country -- because the FOA was not in touch with the agricultural community. On the other hand, staff at the Tihama Development Authority felt that the animal science training they had attended was useful.

Undoubtedly, those workshops that are focused on specific content that is both relevant to the participants and presents practical solutions to Yemeni agricultural problems will be more useful than general workshops that deal only with theoretical matters. Needs assessments should be conducted to determine the priority content for the intended clients (e.g. extension staff) and the development of workshops with input from the appropriate institutions such as ARA and the Ministry of Agriculture and Water Resources. It is also important to evaluate workshops with the idea of improving the content and presentations. According to government officials, the FOA should not charge for in-service training. However, they expressed willingness to cover expenses (travel, per diem, materials) for participants. The key condition was that the training be relevant to their needs.

A major question is what type of outreach role the FOA should play and how that role would relate to the teaching and research functions? In the United States, extension is a direct responsibility of the land-grant universities funded by the federal government and states. In most developing countries, including Yemen, extension is a ministry responsibility. Thus, it is unrealistic and undesirable to expect FOA faculty to assume responsibilities for field-level farmer extension.

What then is the appropriate outreach role for the FOA? A study tour report prepared by The Faculty of Agriculture Planning Unit in 1981 contends that the FOA should "demonstrate a willingness and capability of providing extension training and back-stopping for the Ministry of Agriculture extension technicians and field workers, as well as counsel and advice to those in the agricultural sector that seek it" (pg.46). This recommendation is wholly endorsed and it is further recommended that this statement form the basis for the development of an FOA Outreach Mission Statement.

The outreach activities of the FOA have been and are at present *ad hoc* and piecemeal. This is true for both Subproject funded faculty and other faculty, although the Subproject TL has recently tried to correct this situation. Still, a coherent and coordinated outreach program does not exist any level -- faculty or department. As with research, an Outreach Coordinator should be designated. This person should be responsible for both internal and external coordination relating to extension professional development (in-service training) and service outreach. Without this coordination, based on a comprehensive mission statement, outreach will continue to consist of individual efforts that have minimal impact.

Faculty should perform advisory services as part of a planned outreach program and receive appropriate professional credit. Faculty should also be encouraged to seek out opportunities for outreach with government agencies and the private sector that are consistent with their planned programs. Some faculty complained that they had been discouraged by the administration from having contact with counterparts in the ministry. In general, relations between the FOA administration and the private sector and government agencies (ARA and the Ministry) need to be improved so that the outreach (and research) missions of the FOA can be fully developed. By many accounts, these relations have deteriorated under the current FOA leadership.

FOA has various resources that can contribute to faculty outreach functions. The instructional farm and other lands that will be developed can be used for in-service training and demonstration plots. It is feasible that the FOA at some point in the future will be able to conduct field days at its facilities in cooperation with ARA and the Ministry. The Agricultural Economics and Extension Department is another asset. At present, there are two participant trainees in extension education scheduled to complete their training in 1991 and 1992. Another participant training position in agricultural extension has been allocated. Once this training is completed, there will be substantial faculty resource in extension education.

Two extension courses are currently offered -- one on extension program development and the other a combined introduction to extension and rural sociology.<sup>36</sup> A specialization in extension might be a long-term educational consideration for upgrading extension personnel, but for the present and immediate future the emphasis should be on in-service training to improve extension agents' skills.

It is important to keep in mind the very low levels of education of many extension agents. This probably means that agents with elementary and intermediate schooling can't benefit from FOA in-service training as much as those with secondary and post-secondary education. It would be a wiser use of the FOA to focus its training on subject matter specialists and others who backstop field agents. This is especially important considering that the Training and Visit extension approach which is being used in RDPs is dependent on subject matter specialists who provide regular training for field workers.

This approach is consistent with the training of trainers (TOT) methodology which recognizes the importance of training key extension staff who in turn can serve as trainers. It is important in this regard to provide not only training in specific subject matter (e.g. crop production, animal nutrition) but also in extension methods and training skills and techniques. Thus, in addition to focusing in-service training on subject matter specialists, it is recommended that attention be directed to training extension specialists who can provide leadership, training, management and integration with other services (e.g. suppliers of production inputs). This can be accomplished through the faculty resources which will soon be in place in the Agricultural Extension and Economics department.

An important issue concerns funding of outreach activities. In some cases funding may be forthcoming from collaborating agencies and regional development projects. As with research, it is reasonable to expect that some funding can be made available from FOA. The Subproject should also give consideration to funding outreach proposals. If consulting services are provided as part of the outreach function then it is not unrealistic to expect that at least some of the costs can be covered by the client enterprises. Faculty should be encouraged to seek out consulting opportunities, not for private gain, but as part of the FOA outreach effort.

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<sup>36</sup> A program of courses in extensions is suggested in Annex H.

Faculty should also give some attention to preparing extension publications. Credit should be given for this effort when salary and promotion decisions are made. The former Director General of Extension and Training, who now has primary responsibility for Agricultural Information and Documentation, underlined the need for FOA faculty to help in the preparation of extension messages. Faculty should be encouraged to lend their expertise to the communication of agricultural information to both extension staff and farmers.

Incorporating a well developed outreach component into the FOA will be a gradual process that entails a long-term perspective. The Escuela Agricola Panamericana in Zamorano, Honduras, which has been evolving from high school into a land-grant type institution for 48 years, only included extension projects in 1988 to complement its teaching and research programs. Other institutions such as the Moroccan IAV Hassan II, although not a land grant university, has included extension and outreach in its programs since its creation. The IAV is now contributing to planning and executing extension activities in Morocco, and its faculty members perform consultancies in various developing countries. It is then critical to begin building the FOA outreach program now so that by the end of the Subproject faculty will be playing a key role in outreach activities that support Ministry of Agriculture extension. To accomplish this, formal linkages must be established with the appropriate Ministry units, and it is incumbent on the FOA to forge these linkages.

#### **4. Conclusions and Recommendations**

FOA is not and will not become a land-grant institution. Research and Extension are under the responsibility of the MAWR. Both activities are at best in an incipient stage at FOA. The key issue is the place that these two activities will occupy in the development of FOA and the role that FOA will assume in agricultural and rural development.

##### **a. Research:**

- The FOA/ET recommends that research be a major component of the FOA's mission and organized as part of the faculty development and the institution building process aimed at serving agriculture and rural development in Yemen. The following specific recommendations support this general recommendation.

We recommend that thesis research prepared by young Yemeni faculty members as part of the requirements for higher degrees be performed in Yemen. Research within the country as part of the requirements for degrees will encourage and stimulate young faculty to be more innovative in working in local conditions and develop local means (e.g., labs, data analysis) to the benefit of the institution building process.

Successful development of the Hassan II Agronomy and Veterinary Institute in Morocco is due in part to the fact that the faculty is not being developed by simply sending participants to the United States for Ph.D. degrees. Rather, all faculty participants upon completion of preliminary examinations in the United States return to Morocco and conduct dissertation research on Moroccan topics, in their Moroccan environment and laboratories. Topics are defined in coordination with United States academic advisors who visit Morocco twice before the completion of the thesis. This formula benefits the faculty at IAV Hassan II, and the U.S. universities involved in the project.

- We recommend that research at FOA be encouraged and not restricted to faculty promotion. Even for full professors research should be part of their continued development and evaluation. This requires clear positions definition and evaluation of achievements. Incentives to encourage innovation and productivity at this level include publication in international scientific journals and participation in international meetings.
- We recommend that research performed at FOA be oriented toward the practical reality of Yemeni agriculture. In various developing countries, institutions like FOA face questions related to the nature of research (fundamental, applied adaptive). Successful institutions are the ones where research is "open" toward development. They are conducting, disseminating,

and teaching adaptive research in agriculture. This requires sound choice of research topics so as to be relevant to the Yemeni agriculture. It implies also a need for research to be performed in various regions (environments) of Yemen. FOA faculty members should have access to farms under the control of the services of the MAWR.

Operational coordination and linkages with the Agricultural Research Authority is needed at this level. FOA faculty members should also take initiatives with the private sector in order to develop research activities.

- As mentioned in Section III B, we recommend that a research committee be formed. It should be a cross-department committee that deals with such things as research policy, procedures, proposal review, funding and editing the scientific journal. The committee should be chaired by a research coordinator, who should be a faculty member with a good research record so as to provide effective leadership to the research effort and be responsible for internal and external coordination of research matters. This faculty member will be the editor of the Scientific Journal. The project team leader should be a member of this committee.
- We recommend that the instructional farm also be used for research purposes. Faculty members and student should be assured of having access to land, animals, and equipment at the farm to conduct research. Students need to learn about research methods and faculty need to conduct experiments on campus. (Organizational aspects of the instructional farm have been discussed in Section III C.)
- We recommend that the support services (laboratories, library, computers) discussed in Section III C should be used also for research. At present, the project is providing funds to cover the cost of some research support services. FOA administration is providing little if any research support.

It is recommended that additional funds be made available from the FOA administration for faculty research support.

**b. Extension/Outreach:**

- The main issue is how should FOA contribute to extension in Yemen.
- The first contribution should be through a production of qualified graduates with enough skills to have a significant impact on rural development. The Ministry of Agriculture is planning to use more graduates from FOA in extension (as extension agents with appropriate incentives). It is the task of FOA to adequately perform the education and the training of its students. (Recommendations for this have been proposed in Section III C.)
- The second major contribution of FOA to extension should be the production of scientific and technical information. Officials from extension services mentioned the lack of such information from FOA. And, besides the newsletter from the Animal Science Department, no information for extension is published from FOA.

The FOA/ET recommends that efforts from the faculty members and the administration of FOA be made in this regard. Officials from the General Directorate of Information and Documentation at the Ministry of Agriculture and Water Resources expressed interest to have such information and willingness to disseminate it.

- Many extension agents have low levels of education. We recommend that FOA contribute to the continuous education and training of those agents. Faculty members should develop the skills to do so. The organization of such education and training session should be institutionalized. Faculty members should be encouraged to make initiatives in this regard.

The creation of bodies for coordination such as "society or association of animal production, etc. . . ." will facilitate this organization of outreach activities. The sustainability of FOA will benefit from such operations.

- A coherent, coordinated extension/outreach program should be developed at FOA.

In this regard, we have previously recommended that an extension/outreach committee be created at FOA. The committee should be cross-department and chaired by a faculty member/coordinator with a good extension record so as to provide effective leadership in extension/outreach and be responsible for internal and external coordination of outreach activities.

### III. SUBPROJECT MANAGEMENT

The FOA Subproject was developed and has been implemented under the overall CID Agricultural Development Services Project. This is a large-scale, organizationally-complex project created in the Title XII collaborative mode that placed CID and its member universities at the center of the design and implementation of USAID's assistance for agricultural development in Yemen. The success of the collaborative mode, the overall ADSP, and its various subprojects, is beyond the scope of this midterm evaluation of the FOA Subproject. Our discussion of management by the three parties(USAID, CID/OSU, SU/FOA) is limited to the Subproject itself.

It does appear that the ADSP mechanism was effective as a means for designing the FOA Subproject and providing support to the FOA before the Subproject was approved. Expenditures began in 1983, under an objective in CORE to design a subproject to assist the development of a faculty of agriculture at Sana'a University. These expenditures by CORE continued through FY 1985 and totaled US\$ 4.4 million, which were then transferred to the FOA Subproject in December 1987. Expenditure under the FOA Subproject itself began in FY 1986 and will continue through the Project Assistance Completion Date (PACD) in FY 1996.

#### A. USAID

As the USAID management of ADSP has evolved, assistance to the FOA has taken three distinct forms:

- January 1983 through December 1987 -- support provided under the CORE Subproject of ADSP
- January 1988 through September 1990 -- support provided through the FOA Subproject of ADSP
- October 1990 through September 1996 -- support to be provided through a stand-alone FOA Project.

In each of the three phases, the assistance has been, and will be, provided through a USAID contract with CID and a subsequent subcontract from CID to OSU as lead institution. At both levels, the contracts are broad statements of objectives and resources available with few specifics on levels of effort. To tighten the relationship between inputs and outputs, USAID now requires a comprehensive annual work plan based on modules, and has instituted a project planning and financial management system.

The FOA/ET regards the FY 1990 Faculty of Agriculture Annual Work Plan as complete, systematic, and informative on all aspects of the Subproject. It gives a detailed accounting of how resources will be used during FY 1990. Financial management is complicated because some resources are provided through the CID/OSU contract, others outside the contract. Some are within the USAID project management matrix, others outside it.

The FY 1990 Work plan discusses the status of each module and specifies, often in qualitative terms, what "outputs" will be produced this year with the "inputs" allocated to each module. Information is also available on the cumulative expenditures under the Subproject. What is missing is an explicit connection between existing work planning and financial management to outputs and end-of-project indicators in the project paper. Given the length of time the Subproject has operated, and the expenditures incurred, to what extent have the outputs been produced and the end-of-project status achieved? The FOA/ET believes that dialogue on this vital question should be initiated among the three collaborating parties.

USAID's funding intentions for the remainder of the approved project period do not seem clear. The TL has been projecting expenditures against the original total Life of Project (LOP) funding of US\$ 29.2 million. He believes expenditures at the present level will virtually exhaust that amount by FY 1994. Moreover, with

the pending termination of the Support Module Yemen (SMY) and the "stand-alone" status of the FOA project, additional logistical and administrative services will have to be provided within the Subproject. These will increase costs and will require contract amendments to insert these activities into the Subproject. USAID should take the necessary steps to promptly amend the contract and also provide full information about the long-term financial status of the Subproject.

At the same time, clarification is needed about the future contributions expected from CID when the FOA is operating independently and OSU has the implementation responsibilities. A similar question arises about the continued handling of participant trainees by Colorado State University. Elsewhere we are recommending some modifications in faculty development to more closely integrate the future faculty members with the FOA and make their degree research more relevant to Yemen. Having the same institution that implements the project handle participant training might facilitate this integration.

Finally, USAID management appears to be operating somewhat at variance with the concept of mutual decision-making among three collaborating parties. Relationships between the contractor and USAID are close and compatible. With regard to the FOA, something of an "enforcer" attitude can be detected on the part of USAID. Legal requirements and appropriate management procedures must of course be respected by all parties, but the progress of the FOA will benefit more from continuous and constructive dialogue on goals, problems, and priorities than the use of expenditure controls to influence policies and decisions.

## **B. CID/OSU**

### **1. Long-Term Commitment**

The contractor has had the great advantage of the long-term period (11 years) and substantial financial support (US\$ 29.2 million) authorized when the Subproject was approved in 1985. Moreover, at that time support was already being provided to the FOA through CORE, going back to 1983. Few USAID projects in recent years have had as favorable treatment in terms of length of project period and financial resources.

The contractual relationship is from USAID to CID and then to OSU as lead institution. Neither USAID nor the university contractor has been well-served by the broad, general language on which the existing contract is based. Steps USAID has taken to tighten its management approach were described in the previous section. Working out a contract for the remainder of the project period that identifies more clearly what is to be accomplished and specifies the contractual levels-of-effort required would benefit both parties. The question about total LOP funding was also discussed earlier.

### **2. Support Modules**

Administrative and logistical support and back-stopping have been provided through in-country support Module-Yemen (SMY), not funded through the Subproject, and on campus in the U.S. through Support Module-US (SMUS), which is funded through the Subproject.

SMY is at present providing effective support. However, as noted in the USAID section above SMY will terminate on September 30, 1990. Its important services of fiscal accounting, personnel management, vehicle support, translation, local procurement, expediting of shipments, and other important services will no longer be available. These will have to be covered by the Subproject itself in its new status as an independent project. These services are not contemplated in the Subproject budget. Hence, the need to clarify the total funding and scope of services under the remaining six years of the FOA project and undertake any necessary project amendments.

SMUS is based at OSU under the direction of the Campus Coordinator, who has a supporting staff. Its work is technical backstopping and administrative support, including procurement. We are not aware of any particular problem with the campus unit. While there have been some problems and delays with procurement, these do not seem to be unusual or serious. Procurement procedures are set out in the FY 1990 procurement plan. While the system seems rather laborious, most likely with USAID and GRY regulations little simplification is possible.

As noted earlier, it is not clear to the FOA/ET what role CID has played, and more importantly will play in the future of the Subproject. Most of the project activity seems to be handled directly with OSU and its SMUS, but technically the Team Leader represents CID as the contractor for the Subproject. There may have been advantages to this arrangement earlier, and there may be some now, but no one has pointed them out to the FOA/ET.

### **3. Working Relationships**

The Subproject TL seems to have good working relationship with the several parties now involved in the Subproject, including USAID, SU, Stanley Consultants, the various CID subprojects, and agencies of the MAWR. The Subproject relates to the other subprojects through a council of Team Leaders. The Subproject Team Leader chairs this council, which has added to his workload and competed with his activities on the Subproject itself.

The exception, and it is a crucial one, is the lack of a close counterpart relationship between the TL and the Dean of the FOA. This leads to a serious lack of communication. The TL is excluded from participation in FOA committees and administrative meetings. He seems to be consulted mainly when the use of Subproject financial resources is in question. A good example is that he does not attend the meetings of the Faculty Council in an advisory capacity. Neither was he involved in the preparation of the FOA long-term plan for 1990/91 - 2000/01. In these circumstances, it is difficult for the TL to serve as an effective advisor and consultant to the Dean, making available his expertise and experience on the many academic and management issues that confront the Dean and the FOA. An improvement in this counterpart relationship is needed if the Subproject is to achieve its institutional development objectives as well as transfer resources.

### **4. Management of Subproject Office and Activities**

The FOA/ET was very favorably impressed by the organization and operation of the Subproject office and the quality of its staff. The responsibilities described in the Scope of Work of the TL are well attended to. This is due to the efforts of the TL, his administrative assistant, secretary, and drivers.

## **C. SU/FOA**

### **1. Working Relationships**

Our recommendations here are closely related to those made above. The Dean needs to more fully understand and observe USAID rules and regulations applying to the Subproject. This should facilitate a better working relationship between him and the Subproject TL.

We further urge that the Dean and all the faculty members appreciate more fully the advisory and developmental dimensions of the Subproject. This transfer of experience and expertise is even more crucial to the long-run success of the FOA than the transfer of resources, which at present is the focus of the interaction of the TL with the Dean and the FOA.

We have already recommended that the TL serve on the Research Committee and *ex officio* on the Faculty Council and Long-range Strategic Planning Committee.

### **2. Departmental Planning and Budgeting**

This year, for the first time, Subproject funds were allocated for departmental use. Departments were required to prepare and submit a plan for spending the allocated amounts. This procedure represents a major step forward toward greater departmental and faculty management and control of resources. It should be encouraged and extended to resources coming from the SU budget.

### **3. Evaluations of Faculty Members**

At present, only TCP professors funded through the Subproject have written job descriptions and are required to submit monthly reports of activities and accomplishments. The FOA/ET feels monthly reports are excessive; reporting on a quarterly or even semester basis should suffice.

The FOA/ET further recommends that a standardized system of job descriptions, evaluation criteria, annual reports of activities and accomplishments, and an annual review of the performance of all faculty members with respect to teaching, research and scholarship, and outreach/service, be instituted. Each faculty member would then know what is expected of her/him and the criteria by which she/he will be evaluated, and be responsible for reporting information on her/his accomplishments to the department head and dean.

#### **D. Summary of Recommendations**

- USAID should clarify the funding level for the Subproject through FY 1996 and undertake whatever contract amendments are necessary to authorize the management and logistical support that will no longer be available from SMY after September 1990.
- USAID should seek to re-establish a more collaborative approach with the SU/FOA, with discussions concentrating on goals, constraints, and priorities rather than on expenditure approvals. Interaction with the Faculty Council and faculty members is suggested.
- USAID and CID/OSU should review the roles and responsibilities of each party under the Subproject contract. A clear indication of the role of CID is needed. This is especially important as the Subproject moves to the status of a "stand-alone" project. Better integration of participant trainees into the FOA should also be achieved.
- A more effective counterpart relationship between the Dean and Team Leader is essential. The Team Leader should function in an advisory, developmental role and be included in committees, management meetings, the Faculty Council, and the FOA Long-range Strategic Planning Committee.
- A standardized system of job descriptions, evaluation criteria, reporting of accomplishments, and annual performance evaluations should be instituted for all faculty members.
- A system for providing funds to departments and requiring them to develop annual expenditure plans should be developed, extending the allocation of Subproject funds to departments that began this year to SU budget resources.

#### **IV. KEY ISSUES AND RECOMMENDATIONS**

The purpose of this part is to identify the issues about the FOA that we believe to be most important and indicate our recommendations for dealing with these issues. Many of the specific recommendations made in Sections III and IV above flow out of the general recommendations included here and are not repeated. The added intent in this part is to integrate across the various aspects of the Subproject and FOA analyzed earlier and produce a coherent set of major recommendations.

##### **A. Mission and Leadership of the FOA**

The following statement of mission is taken verbatim from the 1988 - 89 Faculty of Agriculture Catalogue.

##### **Faculty Goals**

The main goal of the Faculty of Agriculture, Sana'a University, is the preparation of qualified manpower to meet the socioeconomic development needs of YAR. Major sub-goals:

1. Prepare sufficient numbers of qualified agriculture graduates required by the various agriculture sectors.
2. Have a balance of theory and practical experience by which graduates are well trained to play their expected roles effectively.
3. Provide graduates specific training in certain fields of agriculture to meet the country's needs for graduates in the various fields of agriculture according to established priorities.
4. Provide a competent instructional program. The Faculty Education program has been based on the experience of some of the best universities in the world as well as experience of the local agricultural organizations.
5. Strengthen the ties between the Faculty of the agricultural community. The Faculty members extend their services to farmers and cooperates with the present agricultural organizations in organizing training programs inside and outside the Faculty.
6. Offer workshop, seminars, symposia and conferences to students, alumni, local agricultural agencies, as well as participants from other Arab and foreign countries.
7. The faculty in addition to education and extension, also coordinates research. Research activities are encouraged amongst the Faculty staff as well as joint research work with the ARA staff. Also, the Faculty participates in the preparation of the National Agricultural Research Plan.
8. The Faculty Plan is to increase the number of graduate students abroad through the channel system in order to have their M.Sc. and Ph.D. research problems directly related to Yemeni agriculture.
9. Develop agricultural cooperatives by organizing training programs and establishing new cooperative societies.

10. Provide reference material on agriculture. The design of the Faculty's main building includes a fully equipped library with all the necessary text, reference books, periodicals, etc. In addition, the faculty will publish its Journal of Agricultural Science and Research.
11. Establish several instructional farms in various agroecological regions, especially in Marib, al-Jawf, Tihama, and the Highlands in order to develop agriculture and encourage the Faculty staff in scientific research.
12. Establish a Faculty of Veterinary Science to contribute to the development of an animal production section.

This is a very expansive statement of ambitious goals and sub-goals for the FOA. It is consistent with the premise that high quality education in the FOA is dependent on the character of its curriculum and instructional programs, the competence of its faculty members who must be active in research and extension/outreach as well as on-campus teaching, and the connection of the FOA to the public and private agricultural sectors and the reality of farm and rural households in Yemen.

This mission is widely accepted in principle but not yet well established in practice. To achieve it will require that the FOA enjoy the finest and most visionary leadership from its Dean. It is critical that the role of the FOA be articulated widely to individuals, agencies, organizations, and associations in the public and private agricultural sectors, and establish close and mutually beneficial working relationships. Forging collaborative and constructive working relationships necessary for the long run sustainability of the FOA needs more attention from the Dean and administrative officers of SU.

The FOA/ET recommends a re-examination of the philosophy and content of the educational programs. In addition to specific competencies and practical skills, graduates should be educated to scientifically conceptualize problems and analyze solutions, understand the socioeconomic reality of the Yemeni nation, and function as productive members of the Yemeni economy. Educational programs should be more responsive to the actual manpower needs of the country's farm and agribusiness sectors as reflected by employment opportunities and job and earnings profiles of the graduates.

#### **B. The Number, Quality, and Productivity of Yemen Faculty Members**

The FOA/ET fully endorses the need to staff the FOA with high quality Yemeni professors as rapidly as possible. Current attempts to accelerate faculty development are welcome. The planned total number of faculty members and mix of interests, however, should be reviewed. Recruitment of additional professors from existing Yemeni professionals is encouraged.

We strongly recommend that strict guidelines be established for the length of time participant trainees are permitted and that every future faculty member be required to return to Yemen for his/her doctoral research. Bringing their major professors for supervisory visits will help to expose the FOA to a wider group of international agricultural scientists and promote future exchanges and collaborative working relationships with US universities.

To mobilize the energies and talents of faculty members an open, decentralized, and participatory system of management and governance is required. For accountability within this system, job descriptions and criteria for evaluation should be established, faculty members should periodically report accomplishments, and be evaluated annually on their performance.

#### **C. Increasing the Developmental Contributions of the Subproject**

At the present time the subproject accounts for 90 percent or more of the total operating budget of the FOA. This situation raises serious concerns about the financial sustainability of FOA programs in the long term.

Given the existing needs for personnel, equipment, materials, and supplies it is not surprising that the bulk of Subproject funds has so far gone to equip the FOA, build its new facilities, and provide teaching staff and operating expenses for a student body growing beyond any expectations. There are indications that the SU contributions have been increasing but neither at the rate nor from the level that would make the FOA self-sustaining at any foreseeable time in the future. The SU administration expresses strong support for the FOA, on a par with the medicine and engineering faculties, but is severely limited in the budget resources at its disposal.

Nevertheless, it is time to review the utilization of the resources of the Subproject and emphasize their use for developmental objectives. The FOA/ET recommends that future long-term and short-term technical assistance be provided only for advisory/developmental purposes. As previously recommended, while some expatriate on-line professors may still be required, and paid for by USAID funds, they should be contracted by SU solely under its own rules and regulations.

Furthermore, we believe it is essential that the TL operate as a close advisor to the Dean and participate in the planning and management processes of the FOA.

Requirements for further technical assistance (long-term and short-term) under the Subproject need better definition than they have been given so far. This is a high priority item for action by the TL and Dean. This should be accomplished in a context of a sustainable institutional development process that guides project inputs and resource transfers.

Turning over equipment procured by the Subproject for operation and maintenance by the FOA has already begun. This process should continue. The FOA should cooperate in this process accepting cheerfully the restrictions imposed by USAID and not delay hoping the rules will change. The critical need is to assure that the equipment is properly maintained and efficiently utilized to support teaching, research, and outreach programs.

#### **D. Sustainability**

This emerges as the key challenge for the FOA and the Subproject. It has a definite qualitative dimension. The FOA will continue to exist but can it sustain the quality of its programs and maintain its physical plant and facilities?

While the FOA must compete for the strictly limited resources available through SU, its long-run viability depends on its success in generating demands for its graduates, research capacity, and outreach capabilities in the private and public agricultural (including agribusiness) sectors. Only strong support from its client groups expressed through effective political action will result in adequate financial flows to the FOA.

The FOA must deliberately act to help itself. It needs to reach out vigorously to the MAWR, other public agencies, donors, and the private sector seeking funding opportunities outside the SU budget. Faculty members should be encouraged in their efforts and Subproject funds should be used more as "seed money" to facilitate their search than as direct support that will likely terminate with the Subproject.

The possible continuation of USAID support after the end of the Subproject was mentioned frequently to the FOA/ET. While it is too early to make a case for that, 11 years is in reality a short time in which to create a viable and sustainable university unit from scratch. What is certain is that the nature of the assistance should change from emphasis on capital investment and recurrent budget support to funding for innovative and additive elements and activities that improve the quality and extend the range of the FOA's teaching, research, and extension/outreach programs. The transition to this high impact approach should begin in the period remaining before the PACD of the Subproject.

The decision to establish the FOA was a very good one in the opinion of the Evaluation Team. SU and the FOA itself should take great pride in what has been achieved in the few years since 1984. USAID deserves much credit for the generous support it has provided and will provide through 1996. We are sure that everyone involved shares the concerns we have raised about the long-term sustainability of the FOA at a

quality level that fulfills the aspirations of SU and meets the needs of the agricultural public and private sectors in Yemen. We recommend that the Dean and TL submit a joint report each year to the SU administration and USAID that assess progress toward sustainability achieved that year and sets goals for the coming year. The success of this continuous institutionalization effort over the next five years should be an important consideration in USAID's determination of future support for the FOA.

ANNEX A

**A.I.D. Evaluation Summary**

# A.I.D. EVALUATION SUMMARY PART I

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

**A. REPORTING A.I.D. UNIT:**

USAID/Yemen  
(Mission or AID/W Office)  
(ES# )

**B. WAS EVALUATION SCHEDULED IN CURRENT FY ANNUAL EVALUATION PLAN?**

yes  slipped  ad hoc

Eval. Plan Submission Date: FY \_\_\_ Q \_\_\_

**C. EVALUATION TIMING**

Interim  final  ex post  other

**D. ACTIVITY OR ACTIVITIES EVALUATED** (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)
	Faculty of Agriculture Subproject Agricultural Development Services Project			_____, 1996	\$29.2 million

**E. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR**

Action(s) Required

1. Encourage the Ministry of Higher Education and the Ministry of Planning and Development to jointly undertake a study of the private and social rates of return to university training under the GRY policy of free education.
2. Request the SU/FOA to sign a memorandum of understanding with the Oden University Faculty of Agriculture specifying the roles of the two faculties in agricultural higher education in Yemen.
3. Assist the Ministry of Higher Education and the MAWR in a needs assessment for post-secondary, technical diploma training for agricultural technicians.
4. Recommend that the GRY discontinue external scholarships for undergraduate agriculture study, at least in general agriculture and the fields of specialization offered by the FOA.
5. Request the FOA and MAWR to undertake a study of the need for BS-level graduates in agriculture for the rest of this century.
6. Request that the Faculty Council of FOA appoint a Long-range Strategic Planning Committee to annually update a (rolling) 10-year plan.
7. Request copies of minutes of the Faculty Council showing attendance agenda, and actions taken.

Name of officer  
responsible for  
Action

Date Action  
to be  
Completed

(Attach extra sheet if necessary)

**F. DATE OF MISSION OR AID/W OFFICE REVIEW OF EVALUATION:** mo \_\_\_ day \_\_\_ yr \_\_\_

**G. APPROVALS OF EVALUATION SUMMARY AND ACTION DECISIONS:**

Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
Signature Typed Name			
Date: _____	Date: _____	Date: _____	Date: _____

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

While recognizing the progress that the FOA and the lead university have achieved in designing a "competency-based" curriculum, the FOA/ET viewed the long list of competencies in nine areas as infeasible to teach in four years and too heavily weighted toward practical "hands-on" skills.

The FOA/ET strongly recommended more decentralized management and participatory governance for the FOA. The Associate Dean should be designated in-charge of instruction. Coordinators should be appointed for research and extension/outreach activities.

The team felt that the FOA should make more use of basic courses in other faculties as it does in the Faculty of Sciences.

An impressive computer network is included in the new facility. The team saw little use being made of the existing computers that are locked in cabinets inside a locked room. Additional efforts are needed to train faculty members and encourage computer use for teaching, research, and administration. What has already been achieved in the Animal Science Department can provide a model for other departments.

Subproject management would benefit from the improvement of collaboration among the three parties. USAID should expand its dialogue with SU officials, the FOA Faculty Council, and faculty members, concentrating on goals, constraints, and priorities. A more effective counterpart relationship between the dean and team leader is needed so that the expertise and experience of the team leader can be more fully utilized.

A standardized system of job descriptions, evaluation criteria, reporting of accomplishments, and annual performance evaluations should be instituted for all faculty members.

Sustainability is the key long-term issue concerning the FOA and the Subproject. The FOA/ET believes the decision to establish the FOA was correct and that SU and the FOA itself should take great pride in what has been achieved since 1984.

The success of this continuous effort over the next five years should be one of the main factors in USAID's determination of future support for the FOA following the terminating the Subproject.

The Midterm Evaluation of the Faculty of Agriculture Subproject was conducted by a 4-person team in Yemen during May 20-June 18, 1990. It consisted of a comprehensive institutional assessment of the FOA in regard to: 1) strategic planning and development, 2) management and governance, 3) curriculum and instruction, 4) support services, and 5) research and extension. In addition, management of the Subproject by the three collaborating parties was evaluated. Finally, key issues and recommendations were formulated. Sustainability was identified as the most important concern. Suggestions to improve sustainability were made and an annual analysis of progress toward sustainability recommended.

ABSTRACT

**I. EVALUATION COSTS**

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

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

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

COSTS

**A.I.D. EVALUATION**  
**Part 1 - Section E. Continued**

8. Recommend to the SU administration that the FOA Dean appoint an Associate Dean for Instruction and FOA Coordinators for Research and Extension/Outreach.
9. Request a schedule from the FOA for 1990/91 and each academic year thereafter showing courses to be offered, professors assigned and use of ARA staff as part-time teachers.
10. Recommend that the FOA organize four committees (curriculum/instruction, research, extension/outreach, and instructional form) with specified responsibilities and authority.
11. Request the Dean of FOA to submit a plan for training the administrative staff and computerizing registration and record-keeping.
12. Request the FOA to submit a list of general education courses that its students will take in the Science, Commerce and Economics, and Arts Faculties.
13. Encourage the FOA to broaden its competency-based approach to give more emphasis to scientific, conceptual, and analytical skills.
14. Direct the Subproject TL to develop a scope of work for a long-term curriculum and teaching specialist.
15. Request the FOA to submit a list of specializations showing dates they will be opened.
16. Request that the FOA Dean submit a plan prepared by the Instructional Form Committee for the operation of the FOA Special Account.
17. Request that the Dean of the FOA submit an analysis of all participant trainee programs completed and in progress and inducing policies to be followed in regard to length of study and conduct of degree research in Yemen.
18. Amend the FOA Subcontract to make OSA responsible for participant training.
19. Phase out TCPs supported by Subproject funds and transfer funds to SU to contract any additional expatriate professors supported by USAID funds.
20. Direct the Subproject to employ a local, Arabic-speaking librarian for the interim period while the FOA librarian is undertaking graduate study.
21. Direct the Subproject to provide a short-term local, Arabic-speaking computer specialist to train the administrative staff and develop word-processing and automated registration and record-keeping for the FOA.
22. Request the Dean of the FOA and the TL to submit a training plan for technician and assistants to handle equipment maintenance.
23. Request the Dean of the FOA to provide information on the extent of use of micro computers for teaching and research and a plan to encourage additional use.
24. Request that SU verify the execution of a maintenance/ custodial contract for the new FOA complex.
25. Request the Dean of the FOA to submit copies of evaluation criteria and job descriptions for all faculty members.
26. Request the Dean of the FOA to submit a mission statement and strategy developed by the Extension/Outreach Committee for extension/outreach activities of the FOA.
27. Request the Dean of the FOA to submit a strategy developed by the Research Committee for promoting research linkages with ARA and securing outside funding for research.
28. Amend the Subcontract to authorize replacement of services provided by SMY and increase LOP funding.
29. Request that the Dean of the FOA submit a letter describing the advisory/developmental role of the TL.
30. Organize a joint USAID/Faculty Council review of the FOA based on the Midterm Evaluation Report.
31. Request that the Dean of the FOA and the Subproject TL submit an annual report to SU and USAID detailing progress the FOA has made toward sustainability of its teaching, research, and extension/outreach programs.

# 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: \_\_\_\_\_

This midterm evaluation of the Faculty of Agriculture Subproject was conducted in Yemen by a 4-member team during May 20-June 18, 1990.

The FOA Subproject was approved in 1989 for 11 years with an authorized LOP funding of \$29.2 million. CID has implemented the Subproject with OSU as lead institution.

The specific purpose of the Subproject is "to support the establishment within Sana'a University of Yemen's first Faculty of Agriculture that is responsive to private and public sector development and has appropriate linkage to the agriculture sector's production and institutional structures." The FOA/ET pointed out that the subproject goal and purpose require that graduates be educated "to plan, manage, implement, and evaluate" and mandate research and extension/outreach responsibilities for the FOA.

The FOA/ET elected to carry out a comprehensive and systematic institutional assessment of the FOA, which involved five major dimensions and functions. Next, management by USAID, CID/OSU, and SU/FOA were evaluated. Finally, key issues and recommendations were formulated.

The first aspect assessed was strategic planning and development of the FOA. The FOA is a constituent faculty of a rapidly growing university, whose enrollment has reached 35,000. With unification, the country now has two universities and two faculties of agriculture. To avoid duplication these two faculties should develop a memorandum of understanding specifying the role each will play in agricultural higher education in the Republic of Yemen.

The FOA/ET found no evidence that manpower planning has been considered in the design of the curriculum for the FOA. A study of the need for post-secondary, non-degree technical training of lower-level agriculturalists is recommended.

While recognizing the progress that the FOA and the lead university have achieved in designing a "competency-based" curriculum, the FOA/ET viewed the long list of competencies in nine areas as infeasible to teach in four years and too heavily weighted toward practical "hands-on" skills. The team stressed the need to "educate" FOA graduates by developing their intellectual capacities to understand their society and contribute to its agricultural and sociopolitical development through management and decision-making.

Information about the country's agricultural manpower needs and the employment and earnings profiles of FOA graduates is needed and should be collected annually. This information should be used to plan the size and educational programs of the FOA and evaluate the private and social rates of return to the investment in higher agricultural education.

The FOA carried out an initial long-range planning activity during 1989/90. This activity needs to be continued as a responsibility of a Long-range Strategic Planning Committee formed by the Faculty Council that each year will provide a (rolling) ten-year plan that deals with objectives, issues, constraints, and priorities.

Management and governance of the FOA was the second major dimension addressed by the Team. The Faculty Council has outside members but their involvement is limited by poor attendance. The Faculty Council should meet quarterly on dates specified in advance with an agenda and materials provided for review. Any member missing <sup>as</sup> of many as two meetings in a year should be replaced.

The FOA/ET strongly recommended more decentralized management and participatory governance for the FOA. The Associate Dean should be designated in-charge of instruction. Coordinators should be appointed for research and extension/outreach activities. The number of FOA committees should be reduced to four (curriculum/ instruction, research, extension/outreach, and instructional farm). The first should be chaired by the Associate Dean, the next two by the respective faculty coordinators, and the fourth by a faculty

member. Committee responsibilities and authority should be clearly spelled out.

To relieve faculty members of unnecessary administrative burdens, the FOA administrative staff should be trained to take over student registration and academic record-keeping. They should be provided with computer capability and a simple system designed to automate the administrative operations.

With respect to curriculum, the team found that students, faculty members, and employing agencies all felt specialized instruction is needed. It recommended, however, that all students receive strong general training during the first two or three year and then have the option of electing among a few broad specializations should be strictly limited to those with good employment opportunities and adequate staffing to offer the necessary courses.

The team called for a course on Yemen's rural development that emphasizes the role of women in agriculture and rural households as a general requirement. It also recommended that the present Department of Agricultural Economic and Extension should ~~become~~ <sup>become</sup> the Department of Rural Social Sciences with sections in Agricultural Economics, Rural Sociology, and Agricultural Education and Extension. Staffing needs for this expanded department should be reviewed.

The team felt that the FOA should make more use of basic courses in other faculties as it does in the Faculty of Sciences. These should be regular courses that give FOA students sound preparation in biological, physical, mathematical, and social sciences.

The FOA/ET urged that qualified Yemeni professors be added to the FOA as quickly as possible. The recent acceleration in faculty development is encouraged, as is additional recruitment of existing Yemeni professionals. Future technical assistance provided by the Subproject should be limited to long and short term assignments that have a clear advisory/developmental justification. If additional on-line professors are needed to handle the teaching load, and expatriate professors are funded by the Subproject, they should be contracted by Sana'a University and subject to its requirements, rules, and regulations.

The FOA/ET regarded the Instructional Farm as a unique educational resource. The Instructional Farm Committee and the departments should be more involved in its management and utilization. The FOA's Special Account should be placed under the control of the committee and used first to pay the operating costs of the farm. Any surplus should be used to fund instructional improvements.

The FOA/ET was appalled by the long periods of advanced degree study by some of the faculty trainees. It recommended that a limit of 5 years be allowed to complete work through preliminary examinations for the Ph.D degree, after which the trainees should return to Yemen to undertake their dissertation research. Visits of research advisors should be funded to expose the FOA to more international agricultural scientists.

The FOA will soon occupy a modern complex of fully equipped buildings, which will compare favorably to facilities at institution in developed as well as other developing countries. Paper operation and adequate maintenance of the equipment and buildings is absolutely essential. Training for equipment operation and maintenance is needed during 1990/91. SU should be encouraged to execute the proposed contract for building maintenance and custodial care.

A Librarian for the new facility has been selected but is in language study and then will go for Master's training in the United States. While the Subproject plans to provide TDY assistance for the Library, the FOA/ET concluded that a local, bilingual librarian should be employed by the Subproject as an interim measure for 2-3 years.

An impressive computer network is included in the new facility. The team saw little use being made of the existing computers that are locked in cabinets inside a locked room. Additional efforts are needed to train faculty members and encourage computer use for teaching, research, and administration. What has already been achieved in the Animal Science Department can provide a model for other departments.

Research is necessary for the continued professional growth of all faculty members, as well as to forge

linkages to government research agencies and the agricultural sector. Extension/outreach activities are also needed to forge the linkages of the FOA to the public and private agricultural sectors, which is essential for its own long-run viability. Faculty committees for research and extension/outreach, chaired by coordinators for these activities, have been recommended. Use of the instructional farm for research compatible with teaching should be encouraged. The FOA should define its extension/outreach role in terms of production of scientific and technical information and in-service training of extension agents.

Subproject management would benefit from the improvement of collaboration among the three parties. USAID should expand its dialogue with SU officials, the FOA Faculty Council, and faculty members, concentrating on goals, constraints, and priorities. A more effective counterpart relationship between the dean and team leader is needed so that the expertise and experience of the team leader can be more fully utilized. The team leader should function in an advisory, developmental role and be included in committees, management meetings, the Faculty Council, and the Long-Range Strategic Planning Committee.

A standardized system of job descriptions, evaluation criteria, reporting of accomplishments, and annual performance evaluations should be instituted for all faculty members.

Sustainability is the key long-term issue concerning the FOA and the Subproject. The FOA/ET believes the decision to establish the FOA was correct and that SU and the FOA itself should take great pride in what has been achieved since 1984. USAID has provided generous budget support and all parties must share the concerns the FOA/ET has identified about the long-term sustainability of the FOA at a quality level that fulfills the aspiration of SU and meets the needs of Yemen's agricultural public and private sectors. The team provided some suggestions for promoting the FOA's sustainability. It further recommended that the FOA Dean and the Subproject Team Leader provide a joint report each year to the SU administration and USAID that assesses progress toward sustainability achieved that year and sets goals for the coming year. The success of this continuous effort over the next five years should be one of the main factors in USAID's determination of future support for the FOA following the terminating the Subproject.

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

ATTACHMENTS

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

MISSION COMMENTS ON FULL REPORT

## ANNEX B

### List of Persons and Organizations Contacted

#### USAID/Washington:

Mr. Peter H. Deinken, Yemen Desk  
Officer  
Mr. Paul F. Novick, ANE/TR/ARD

#### USAID/Sana'a:

Dr. Kenneth Sherper, Director  
Mr. Michael Lukowski, Dep. Director  
(old)  
Mr. Phillip Gary, Dep. Director (new)  
Mr. Abdullah Al-Shami, Program Office  
Mr. Ben Hawley, Program Officer  
Dr. John Swanson, Chief, ARD  
Dr. Abdel Moustafa, Deputy ARD  
Mr. Nasr al-Ghoorairy, ARD  
Mr. Kamal Siddik, ARD  
Mr. Jamil al-Baadani, ARD

#### Sana'a University:

Dr. Abu Baker Al-Qirbi, Vice Rector  
Dr. Ali El-Shekeil, Dean, Faculty of  
Science  
Mr Tarek Afif, Engincer  
Mr. Abdelkarim Mohamed Daar  
General Director of Finance at SU,  
Ministry of Finance

#### Faculty of Agriculture:

Dr. Abdulla Al-Mujahed, Dean  
Dr. Ali Al-Bar, Associate Dean  
Dr. Amin Al-Humairi  
Dr. Salem Al-Ramah  
Dr. Mohamed Al-Zumair  
Dr. Abdul Rahman Nassar  
Dr. Ousama Al-Awa  
Dr. Tawakul Younis Rizk  
Dr. Hussein El-Kholy  
Dr. Abdul-Hamid Butt, Registrar  
Dr. Esam Fayed  
Dr. Hashem Suliman  
Dr. Hussain Al-Hennawi  
Dr. Abd-Elnaby Obald  
Dr. Mahmoud Hashim  
Dr. Fathi Bedeir  
Dr. Waheed Mujahed  
Dr. Aly Korayem  
Dr. Nasser A. Aulaqi  
administrative staff  
teaching assistants & technicians  
students

#### FAO/SANA'A:

Dr. Makram Lamy, Program Office  
Dr. Antoine Kharrat, Sr. Adviser to  
the Proj. Mgr., FAO Extension  
Project.

Dutch Embassy

Dr. Alex A. Bartelink, 1st Secretary,  
The Royal Netherlands Embassy

CID/Yemen:

Dr. Stanley Miller, FOA Subproject Team  
Leader  
Dr. Dana Thomas, CORE Team Leader  
Dr. Hameed Magid, Hort. Project Team  
Leader  
Mr. Dick Field, Farm Management  
Adviser, FOA Subproject

Stanley Consultants:

Mr. Orville Heim  
Mr. Lel Medford

Ministry of Agriculture and Water Resources:

Mr. Mogbil Ahmed Mogbil, Deputy  
Minister  
Mr. Abdul-Hafeez Karhash, General  
Director of Agricultural Affairs  
Mr. Abdulmalik Althawr, General  
Director of Planning and  
Statistics  
Mr. Mohamed Oubad Lotf, General  
Director of Extension (now  
Documentation and Information)  
Hassan Al Haraibi, Central Highland  
Development Project

Ministry of Education:

Dr. Mohamed Alhirazi, Deputy Director  
of Ministry of Education incharge  
of Secondary school  
Mr. Sunny Langham, New Mexico State  
University

Field Visit:

Mr. Mohamed Sabrah, Deputy Farm Manager,  
Rusabah Dairy Farm  
Dr. Abdulrahman Salam, Director General,  
ARA, Head Quarters, Dhamar  
Mr. Jamal Mohamed, Director of the Sch.  
Agric. Sec. School  
Mr. Ahmed Saif, Deputy Director  
School  
Dr. Ali Al-Thawr, Director, ARA-Taiz  
Station  
Mr. Lutf L. Al-Ansi, Director General  
Southern Reg'l Agri Authority,  
Taiz  
Mr. Moner A.H.S. Saeed, Deputy Gen.  
Manager, Ghee & Soap Indus, Taiz  
Mr. Moh'd Sabrah, Manager  
Zabid Agric. Project  
Mr. Musaad Al-Namer, Director,  
Surdud Agric. School  
Mr. Hayel Saeed, Sheep Fattening  
Farm, Surdud

## ANNEX C

### Background Information Research and Extension in Yemen

#### A. Introduction

Research and extension in Yemen are currently in a state of transition as a result of the unification of the Yemen Arab Republic (YAR) and the People's Democratic Republic of Yemen (PDRY). Since government reorganization, research and extension, which previously were separated, have been united in the Agricultural Research Authority (ARA). The ARA is currently within the Ministry of Agriculture and Water Resources, which itself is reorganized from the Ministry of Agriculture and Fisheries, with Fisheries now located in the southern part of the country (or what was the PDRY). Since this reorganization is largely "on paper" at present, this report looks at research and extension under separate headings. For the time being, extension continues to operate as before -- in a fragmented fashion through various agencies, programs and projects. In this respect, the unification of research and extension is a welcome development which has the potential to improve both functions to the benefit of Yemen agriculture.

#### B. Research in Yemen

Research in Yemen is a relatively recent endeavor, dating to the early 1970s when three agricultural projects were set up with FAO/UNDP funding in the Ibb highland region, the Taiz Midland region and in the Zibid region of Tihama. Until the early 1980s, research was carried out through various projects. For example, research has been conducted as a component of Regional Development Projects and various bilateral, donor-funded projects such as the Dutch Range and Livestock Management Project in Dhmar. In order to unify national research efforts, the government created the Agricultural Research Authority in 1983. Among other responsibilities, ARA was charged with coordinating all national research and developing and strengthening links with institutions engaged in education and extension.

ARA presently operates three Regional Research Stations -- one each in the Tihama region, the Southern Uplands and the Central Highlands. The Central Research Station in Dhamar is the headquarters and contains the main laboratories for soil and water, plant protection, seed testing and feed/nutrition analysis. There are five experimental farms which serve the regional research stations.

Agricultural research at ARA is largely commodity focused and organized through the following programs: cereals, food legumes, vegetables, fruits, livestock and forages, industrial crops, forestry, plant protection, soil and water, agricultural economics and statistics, and agricultural mechanization. A recent (1988) ARA publication (Directory of National Agricultural Research Projects, 1987-1991) provides information on the priority commodities in each ecological region and a listing of all national research projects by each program. As a general observation, this approach to research would benefit from an effort to include an expanded multidisciplinary, systems approach to agricultural research. There is currently only one Farming Systems Research (FSR) project conducted by the economic and statistics program in the Tihama region.

The organizational structure of ARA includes a Board of Directors which makes policy decisions and advises the Director General. The Dean of the Faculty of Agriculture (FOA), Sana'a University, sits on the Board. In the publication mentioned above there is direct reference to the importance of collaborative research between ARA and FOA. Also, it is important to note that ARA estimates that its manpower needs are four times the present number of researchers and technicians. Although there is a manpower development plan that includes post-graduate training (MS and Ph.D.) abroad, there is an expectation that the FOA can provide BS graduates and the Secondary Agricultural Institutes (e.g., Ibb and Surdud) can supply technicians. Manpower needs include staffing of new regional stations in the Northern Highlands and Eastern Region.

#### C. Extension in Yemen

Extension in Yemen is carried out through various agencies, departments and projects. For example, there is a National Extension Service and a Rural Women Development Department that does extension, as well as extension work in the General Directorate of Agricultural Affairs. Although they are all nominally under the

Ministry of Agriculture, there is very little evidence of national coordination of extension activities. The expectation, of course, is that the reorganization of extension into ARA will improve this situation. This will be a gradual process and, for the present, extension continues to be conducted in a diffused manner.

In an interview with the Director General of ARA, Mr. Abdul-Rahman Sallam, he stated that extension activities in the Regional Development Projects will remain under the supervision of the project Directors for now, with the long-term objective of having extension directed by ARA. In this respect, the Deputy Director of the ARA Research Station in Taiz said that he anticipates increased supervision of extension activities in the future. At present, there is direct contact with extension in the region, with extension specialists and agents doing validation of research results on farms. The Deputy Director confirmed that station research is commodity focused and that "packages" are provided to agents for dissemination to farmers. He acknowledged that there were problems sometimes in integrating these packages into farm systems. He was aware of FSR, commenting that it was new to Yemen and that no one at the station had training in FSR methodology.

Insights into extension activities through the regional development projects were obtained in an interview with the Director of the Southern Uplands Project. The extension work here includes building "Production Centers" covering certain geographic areas, with each Production Center serving six to eight "Extension Centers." Extension activities include providing plant seedlings and other production supplies. At the time of the visit, the Director was very busy coordinating extension efforts to control an infestation of fall armyworms in sorghum. The main extension methodology is the World Bank Training and Visit approach. Various media are used including radio and television. The project conducts its own training of agents in coordination with the Ministry and ARA. Agents in remote rural areas are provided housing or housing allowances and a small financial incentive. According to the Director, some agents are well trained and highly motivated, but others are only seeking the security of government employment and are more office-oriented than field-oriented. A study of extension services in the Southern Uplands project conducted by the FOA Associate Dean (Al-Bar, 1989) shows that 68 percent of the agents had intermediate or elementary education, 19 percent had normal secondary school education and only 13 percent had agricultural secondary school training.

Interviews were also held with various officials at the Tihama Development Authority. Here an "adapted" Training and Visit (T&V) system also is utilized because of World Bank funding. In this sense, extension is "donor driven." The approach involves "lead farmers" who work with "follower farmers." Each agent has approximately 8 lead farmers who, in turn, have about 12 follower farmers. The lead farmers are used for demonstration and validation trials in which "improved" technologies are compared to traditional practices. Agents meet with lead farmers twice monthly and work with the same lead farmers for a year before selecting new ones. Subject matter specialists backstop the agents and provide training on a regular basis. Specialists have MS and BS degree training, while agents are generally secondary school graduates and below.

According to the information obtained, there are 35 field-level agents. If each agent has eight lead farmers and each lead farmer works with 12 follower farmers, then 3360 farmers are contacted in the course of a year ( $8 \times 12 \times 35$ ). It was reported that there are approximately 22,000 farms in the region. This means that in the course of a year about 15 percent of the farm population is being reached ( $3360/22,000$ ). In addition to the T&V approach to farmer contact, there are 22 extension centers and two veterinary centers in the Tihama region that serve as points of farmer contact.

As mentioned above, some agents have a secondary school education and many only have intermediate and elementary school training. Those that have low levels of schooling are given 11 months of in-service training before being posted to the field.

Female agents from the Rural Women Development Department have secondary education or less and are not allowed to attend any of the three Secondary Agricultural Institutes (Ibb, Surdud and Sana'a Livestock).

From a visit to the Ibb school it was ascertained that extension subjects are taught in addition to the technical agriculture courses. Graduates are able to obtain technician-level jobs in the various regional development projects as well as field-level extension positions. It is generally acknowledged that extension agents are poorly trained and that they lack practical agricultural training, even those that graduate from the

secondary agricultural schools. Many of the graduates are interested in continuing their education so as to obtain specialization in some branch of agriculture. At present no such option exists, although there has been discussion of a two-year diploma program at the FOA and Ministry requested that a two-year diploma program for extension agent training be considered at Ibb. So far, no such program is forthcoming.

Interestingly, many graduates of the Ibb school do not pursue agricultural careers. One estimate was that only about 20 percent go into agriculture jobs, and most of these with the government. The preference of most Ibb graduates is to go into higher paying non-agricultural jobs in the private sector or on to higher education. Part of the explanation for this may be found in their urban background. It should be noted that the FOA only takes the three top Ibb graduates a year. This is because the Ministry is concerned about "draining" students away from the regional development projects.

This limited assessment of national extension is generally in agreement with conclusions of the Horticulture Improvement and Training (HITS) evaluation team that extension is "viewed as a function of low status performed by poorly qualified and poorly equipped persons at field-level" (Final Evaluation Report, April, 1990, pg. 33). As the report notes, there is a need to provide and improve in-service training and upgrade the educational level of extension agents. There is also a need to train subject matter specialists at the bachelor degree level who can support field agents. Clearly, the FOA has a role to play in training extension staff and in preparing subject matter specialists.

In an interview with the Director General of Extension, Eng. Luft, he emphasized the mass communication activities of his unit (which under the reorganization of extension into ARA has been given primary responsibility for information and documentation). Communication activities involve a weekly 30 minute television program, 15 minute daily radio programs, a weekly agricultural page in the major Sana'a newspaper and various extension agent and farmer publications. According to Dr. I. Moharam, a rural development advisor to the extension unit, these messages reach the rural areas and are very well received. In his opinion, the low level of agent training can be offset by using mass media. However, over time it will be necessary to improve the level of agent training. It is expected that graduates of the FOA can be hired to work as extension agents, thus progressively upgrading the educational level of extension staff. The Director General stated that there was general agreement that the extension methodology to be applied nationally would be the World Bank Training and Visit system. One reason for this was the provision for regular training of agents in the T&V system, which is important for poorly trained extension field staff. Again, there was an expectation that the FOA could play an important role in agent training.

A final comment concerns research and extension linkage. This linkage will be improved structurally by the integration of research and extension in ARA. The functional linkage between the two areas is a more difficult matter, however. This linkage will be facilitated to some degree by the current, albeit limited, interactions between researchers at the research stations and extensionists located in the development projects that serve the Tihama, Southern Upland and Central Highland regions. To be effective, these interactions should consist of visits by extension agents and farmers to research stations; joint execution of verification trials and demonstration plots; mutually organized production of extension materials; and coordination of such activities as researcher participation in agent training provided by subject matter specialists.

Some consideration should be given to incorporating a Farming Systems Research and Extension (FSR/E) methodology in ARA as a way of improving the functional research and extension linkages. This is consistent with current thinking in the World Bank that recognizes benefits to T&V extension by including FSR methodology. One obvious benefit of FSR/E is the focus on adaptive research and technology generation linked to extension so that generation and transfer are part of the same process or continuum. In a sense, FSR/E "blurs" the distinction between research and extension, making both "researchers" and "extensionists" responsible for technology generation, adaptation and transfer. FSR/E is also based on farmer participation and thus has a strong feedback component built in. It puts researchers, agents and farmers in the field together and has proven effective as a means for agents and farmers to learn about improved technologies, thus improving dissemination efforts. Experience in FSR/E has demonstrated that agents can be effective in conducting on-farm trials and that farmer participation in on-farm trials is an effective extension technique.

ANNEX D

TERM LIST OF STUDENTS ENROLLED AT FOA, SANA'A UNIVERSITY

LEVEL	SPECIALITY	YEMENI			NON-YEMENI			TOTAL		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
First Level	General Agric.	170	7	177	-	-	-	170	7	177
Second Level	General Agric.	146	7	153	-	2	2	146	9	155
Third Level	Crops	20	-	20	-	-	-	20	-	20
Third Level	General Agric.	41	3	44	1	-	1	42	3	45
Fourth Level	General Agric.	179	3	182	3	1	4	182	4	186
<b>TOTAL</b>		<b>556</b>	<b>20</b>	<b>576</b>	<b>4</b>	<b>3</b>	<b>7</b>	<b>583</b>	<b>23</b>	<b>601</b>



	1989	1990	1991	1992	1993	1994	1995	1997
<b>Soil &amp; Ag. Mech.</b>								
Ag. Mech.	Korayem (Ex)							
Farm Machinery								
Farm Power								
Irrigation								
Farm Eng.								
Farm Building								
Soil & Water Mgt.		N. Zeywar (Y)						
Soil Physics		M. Sanabani (Y)						
Soil Chemistry			I. Fatesh (Y)					
Soil Classification				A. Ghanem (Y); (S.U. Funded)				
Soil Fertility	S. Ramah (Y)							
Soil Microbiology								
Field Crop	T. Risk (Ex)							
Field Crop	A. Mujahed (Y)							
Field Crop (Cereal)								
Crop Breeding								
Plant Genetics	A. Agbary (Y)							
Field Crop								
Forages & Past.								
Weed Control								
Crop Prod. (Industrial)								
Hort. (Pomology)	Yemeny (Y)							
Hort. (Veg.)	Butt (Ex)							
Hort. (Veg. Crop)				M. Manibary (Y) (S.U. Funded)				
Hort.								
Floriculture								
Pomology (Deciduous)								
Post Harvest								
Breeding								
Entomology	A. Humairi (Y)							
Plant Pathologist	M. Zumair (Y)							
Plant Path. (Chemical Control)				A. Thabet (S.U. Funded)				
Insecticide		T. Hassan (Y)						
Entomology (B10 - Control)								

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	1989	1990	1991	1992	1993	1994	1995	1997
Administrative Support								
Library								
Administrative Support								

Note: 1) There are 10 P.T. positions to be allocated.  
2) Specializations have been approved for Horticulture and Field Crops. Additional staff will be required to support them. Four new expatriate positions in Horticulture and Field Crops must be made available in 1990.

ANNEX F  
**FOA Farm Management Plan of  
Important Groups and Individuals**

**Basic Duties**

Assoc. Dean

1. Leads in the development of the farm budget and Annual Work Plan in cooperation with the Departments.
2. Serves as Chairman of the farm committee.
3. Receives reports from the Farm Manager.
4. Handles personnel issues related to farm.
5. Reports to the Dean and the Team Leader.

Farm Committee

1. Represents departments.
2. Sets policy for farm operations.
3. Adjudicates disputes among departments and staff members.
4. Recommends on hiring of new employees.

Departments

1. Prioritizes the use of their assigned farm resources (Land & Lab.) and provides for their maintenance.
2. Prepares required requests & reports.
3. Maintains production and use records.
4. Develops curricula and establishes and monitors student competencies.
5. Maintains inventory over assigned resources.
6. Implements research and extension activities.
7. Monitors activities for which the department is responsible.

Farm Manager

1. Administers the farm.
2. Provides monthly activity report to Assoc. Dean.
3. Evaluates performance of farm personnel in cooperation with the appropriate Dept. Head and recommends a course of action.
4. Provides for general maintenance.
5. Supervises farm activities.
6. Controls farm petty cash fund.

7. Reports to Assoc. Dean.
8. Maintains inventory of general resources.
9. Monitors farm security.

#### Farm Manager Advisor

1. Advises Farm Manager.
2. Provides on-job training to farm personnel.
3. Supervises quality control of farm outputs.
4. Leads special projects, as approved by Farm Committee.
5. Maintains inventory of Project resources.
6. Provides project resources consistent with AWP.
7. Reports to the TL/Advisor to the Dean.

#### Farm Manager Advisor to Staff

1. Duties as assigned by Farm Manager Advisor.
2. Provides on-job training.
3. Undertakes special projects, as assigned.
4. Reports to the Farm Manager Advisor.

#### Foreman (Engineer/Tech)

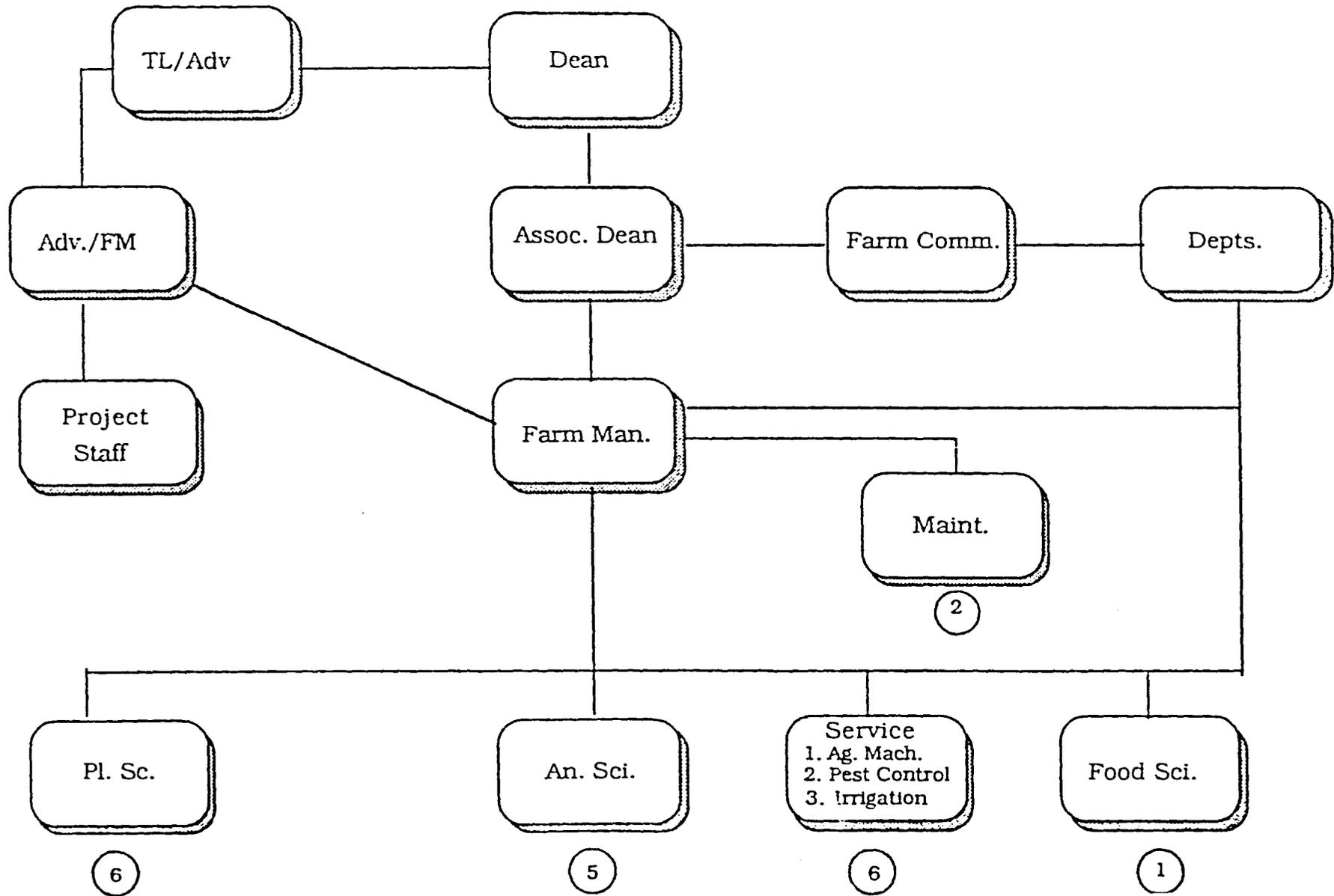
1. Reports to Farm Manager.
2. Responsible for farm activities in assigned area (Farm & Lab.).
3. Receives requests from Departments.
4. Meets daily with Farm Manager and other Foreman to coordinate activities and needs.
5. Assigns duties to laborers as agreed by Farm Manager and departments.
6. Supervises and monitors assigned activities.

#### Laborers

1. Performs duties as assigned by foreman.

#### Maintenance

1. Provides for general maintenance of farm.
2. Reports to Farm Manager.



## ANNEX G

### THE HASSAN II AGRONOMY AND VETERINARY INSTITUTE RABAT, MORROCO

Prepared by Abdesselam Eddebfarh

In various sections of the report, the IAV Hassan II has been cited as a example of an institution in a developing country. These reference were made for the following reasons:

**1. Mission:** Strong linkages between the three components: teaching, research and contribution to development (extension, outreach).

#### **2. Curriculum**

- A reality based curriculum with a strong basic scientific education and strong general training programs before specialization.
- An understanding of the Moroccan rural environment through education in social science and field training organized during each of the first four years to expose the student to the following:
  - Understanding the organization of rural communities (village level): second year;
  - Understanding the rational of farmers/farm level (third year);
  - Get acquainted with a regional problem of agricultural and rural development (fourth year);

#### **3. Research**

Research at IAV Hassan II is a strong component of faculty development and institution-building. It is oriented toward real problems of Moroccan agriculture. Research at all levels (BS, MS, and PhD) is performed in Morocco.

#### **4. Contribution to development**

IAV Hassan II has developed strong linkages with institutions involved in rural and agricultural development.

Continuous training programs are organized in various fields. Faculty members are involved in extension and development programs.

#### **5. Strong linkages with the international scientific community**

During the process of its development, IAV Hassan II developed linkages with the international scientific community. Cooperative agreements have been signed and executed with various agencies and countries in North America, Europe, Africa and Asia.

6. LAV Hassan II, a major regional and international training center, is providing degree training for agriculturalists from Africa. The LAV Hassan II faculty are also involved in consulting assignments in Africa and Asia
  - Students from developed countries (USA, Europe) have performed research for their degrees (BS, MS, PhD) at LAV Hassan II.

A series of international courses and workshop have been organized in various fields.

For more than two decades, LAV Hassan II has had a strong relationship with an American University under a USAID funded project. In order to illustrate the evolution of cooperation and its outputs we present the following paragraphs from the recent project papers and evaluations.

### I. Project Purpose and Goal

Briefly, the purpose and goals are to assist with faculty training and related institution building activities. These activities will provide scientists, managers and technicians needed for Morocco's agricultural development and develop the linkages between education, research and extension to improve the current quality of life and future opportunities of low income farmers and herders.

1. An internationally recognized and trained Moroccan faculty at IAV, ENA and ENFI.
2. An academic program to accommodate 1275 undergraduate students and 550 graduate students. The program is unique in how it maintains close links with Moroccan agriculture through a field training program for a period of time in each of the first four years.
3. A wealth of scientific information generated by the Master's and Doctoral degree training programs, much of which can be prepared into technical packages for use by Moroccan farmers.
4. An agricultural education and research center with a faculty which has close links to Moroccan agriculture and development, but also has strong international links to research and development.

The major inputs provided in FY 1988 were participant training, technical assistance and commodity support.

The project is unique in that, subordinate to its institution building goals, the faculty development activities are planned within the **framework of the institutional growth**. For example, the faculty is not being developed by simply sending participants to the U.S. for PhD training. Rather, all faculty participants upon completion of their preliminary examinations in the US return to Morocco and conduct dissertation research on Moroccan topics, in their Moroccan environment and laboratories. They are awarded the degree Doctorate en Sciences Agronomiques on successful defense of the dissertation. The fact that IAV had the authority to award a Doctorat en Sciences Agronomiques degree has been an additional step in institutional maturity which has allowed an unprecedented movement of IAV toward maturity in an extremely short time span of only 19 years.

Not all participants attend the University of Minnesota. Active support and placement of participants at 36 U.S. universities has been achieved to date.

## II. Project Evolution

Over more than two decades and through a series of three projects, USAID has made an unprecedented long-term commitment to the institutional development and sustainability of the Institute Agronomic et Veterinaire- Hassan II (IAV) in Morocco. The University of Minnesota, a large midwestern U.S. land-grant university, became involved from the outset and has continued to the present as a major partner with IAV in this collaborative institution-building effort.

The first project began in 1969. The Hassan II Institute of Agriculture and Veterinary Medicine was established by Royal Decree in 1968 as a university-level agriculture training and research institution. The inclusion of Veterinary Medicine with the Agriculture Sciences made IAV one of the few schools in the world combining full curricula in Veterinary Medicine and Agriculture Sciences in the same program and with students sharing a common body of coursework and practical field studies during their first two years. The purpose of this initial project was to assist the Institute in planning its curriculum and in developing Moroccan advanced teaching and research capabilities in soil and plant sciences relevant to Morocco's agricultural development needs. Initial goals were to enable Morocco to "improve the quality of its higher education in agriculture by providing exposure to modern teaching, research, and problem-solving methods and to provide highly trained Moroccan manpower to assist in the development of the agricultural sector".

Under the first project, priority orientation in teaching and research was given to the needs of third-cycle students in soil science who were training for the Ingenieur d'Etat degree (roughly equivalent to an MS degree in the US). Less attention was paid to instruction for their Ingenieur d'Application (BS degree).

During much of the 1970s most of USAID's assistance was used to support a small contingent of four to six resident advisors at the Institute. These individuals acted as advisors to the Moroccan faculty and assisted in course design and some teaching, but a significant portion of their time was spent on research and on supervising students engaged in research. At no time did any of the advisors assume administrative roles within the Institute.

The second project, begun in 1974, was broadened to include more disciplines in the agriculture sciences, agronomy, plant pathology, range management, and horticulture. The main emphasis in this project, too, was technical assistance to the third-cycle program and developing of research activities in each discipline. In addition eight to 20 students per year, in their fifth year of a six-year program, were sent for one year of academic training at a U.S. university. Subsequently they returned to Morocco to complete a research study and defend their thesis for their Ingenieur d'Etat degree (MS degree).

Also in 1974, the Institute was authorized by Royal Decree to develop a graduate program that would grant a Moroccan Doctorate in Science degrees. Although the first of these Doctorates was not granted until 1982, the expectation of such a program gave additional impetus to the Institute's collaborative program with AID and the University of Minnesota. The efforts to accelerate the process of training Moroccan faculty to the U.S. PhD level, and to deepen the Institute's capacity to conduct quality agricultural research, became more intense in the late 1970s and involved many more Moroccans in participant training programs at U.S. land-grant institutions. (There were three Moroccan candidates in U.S. PhD. programs studying horticulture in 1978.)

During the 1970s and into the 1980s, the Institute's program gradually became more diversified, with course offerings added in such fields as foods, technology, biochemistry,

rural engineering, surveying, agricultural machinery, and marine science. An important event occurred in 1981 when the Institutes's Horticultural Center in Agadir opened its doors as the first major agricultural candidates for the Ingenieur d'Application (B.S.) degree to the National School of Forestry (ENFI) in Sale and the National School of Agriculture (ENA) in Meknes.

The purpose of the third project, begun in 1980, was to develop a "land-grant type" institution that: (1) produces well-trained people in critical areas whose scientific and technical skills are relevant to national agricultural development needs of Morocco and who are actively contributing to such development; (2) produces scientific information and seeks to solve practical problems through research; (3) assists appropriate government and private agencies and institutions in disseminating such information; and (4) actively participates in broad-based agricultural development activities in Morocco.

The training program is the centerpiece of the current project. By the PACD in 1992, the IAV faculty will include nearly 130 doctorates and another 32 with MS degrees from the US universities as a result of support from this project. In addition, the project has provided 12-15 months of Master's level coursework at US universities for 163 of the Institute's Third Cycle students (47 students had received similar training in the previous phase). They returned to Morocco to conduct thesis research and receive their Ingenieur d'Etat degrees from IAV. Numerous non-degree training and professional experiences for senior faculty (research collaborators), mid-level administrators, and research technicians have also been provided by the project.

Besides these substantial training components, project objectives have included helping develop (1) teaching and research facilities, including laboratories, library/documentation centers, computerized data analysis facilities and services for equipment procurement and maintenance; and (2) the institutional policies and processes needed by a large, complex educational and scientific organization.

In sum, the Institute has evolved in the space of two decades from 12 students taking their basic science training from non-Moroccan faculty in temporary facilities at Mohamed V university to its present status with approximately 2,200 students and 340 faculty members (of which 95 percent are now Moroccan) on its own campuses in Rabat and Agadir. The Institute now offers the Moroccan equivalents of the American BS, MS, DVM, and PhD. degrees in selective disciplines in agriculture and veterinary medicine. In addition, it trains approximately 250 non-Moroccan African students under the same conditions as its Moroccan degree candidates and pays the scholarship costs of all of these students from Government of Morocco budgetary allocations.

Students from US and European Universities, after completion of course work for BS, MS or PhD, go to IAV Hassan to complete their thesis under the direction of Moroccan faculty. They are granted degrees from their home university.

## ANNEX H

### SUGGESTED COURSES FOR AN AGRICULTURAL EXTENSION

#### SPECIALIZATION (Prepared by William M. Rivera)

##### -- **Agricultural Extension and Yemen Rural Development**

The importance of agricultural extension's role in rural development. The significance of this role for Yemen. The components of rural development. Different extension approaches and their impact in advancing rural communities. The role of women in agricultural extension and rural development. The situation of agricultural extension and rural development in Yemen today?

##### -- **Principles of Agricultural Extension**

The principles of agricultural extension. How do these principles differ from system to system? The core principles. Principles particular to specific programs--such as: the Training and Visit Management System, the U.S. Cooperative Extension System, the Taiwanese Farm Information Dissemination System, the French Compagnie française pour le développement textile system. How do these principles apply in practice and what are their implications for agricultural and rural development. What principles most apply in Yemen?

##### -- **Agricultural Extension Systems**

Model extension (and farming research and extension) systems, their commonalities and differences. Types of organization structure, economic returns and cost-benefits, different approaches to field methodology. Systems theory and analysis: the environment as it affects inputs/the transformative process/outputs as they affect the environment. What is the best system(s) for Yemen?

##### -- **Agricultural Extension Program Planning**

The design of agricultural extension. Definitions of program and analysis of the main components of program development. Review program planning approaches and the systematic steps in program planning, including the main techniques within each planning step. Students learn to generate ideas, set objectives, develop a Logical Framework for planning projects, systematically design and chart a program plan. Different program planning models are compared. How do they differ? What are their implications for practice?

-- **Agricultural Extension: Program Evaluation**

Evaluation is crucial to program planning and development. It forces the program developer to ask such questions as: Is the program accomplishing its goals? Is it advancing needed knowledge, attitudes, skills and aspiration? If so, are these affecting practice? Is practice leading to desired outcomes? What are the program's unintended effects? These are some of the questions this course helps students to answer. It provides tools for planning and implementing evaluations of distinct agricultural extension programs.

-- **Agricultural Extension and Communication Skills**

This course takes a broad view of communications--as (i) interrelationships, (ii) software development and (iii) mass media methods of transferring and receiving information for the development of research and extension. Group dynamics. Adult education teaching and learning techniques. Students will develop communications software aimed toward small farmers and to larger commercial enterprises. How would these be delivered? What would be the different techniques used in marketing to distinct audiences?

-- **Agricultural Extension Program Management**

The importance and principles of management. The process of decisionmaking. What is place of program management in the overall extension organization? How does program management differ from organization management? How does it differ from field management? What are the components of program management? How does a teacher go about implementing a program? How does an extension agent go about implementing a program? What are the main components that define an instructional objective? How are agricultural extension programs managed in Yemen--in the Regional Development Authorities, Regional Projects, etc. How does the Agricultural Research Authority propose to develop and implement a national extension program?

-- **Supervision of Agricultural Extension Systems**

Planning and supervision. Personnel management. Office management. Field Management. What is the best way to manage an agricultural extension system? What is a good manager? How do classical management theory and scientific management theory compare? Analysis of basic components of management: planning, organizing, staffing, directing, coordinating and budgeting. Different management approaches--their relevance to the Yemeni agricultural extension situation. Students learn theories of supervision and engage in analysis of management practices in existing Yemeni agricultural extension projects.

-- **Institution Building for Agricultural Extension**

Different approaches to the improvement of agricultural and rural development management--including the structural, organizational process, manpower training, and incentives approaches. The specifics of each approach are examined with regard to organization design, process design, analysis of manpower capacity needs and patterns of incentives for the improvement of extension management systems.

-- **International and Comparative Agricultural Extension**

What can Yemen learn from an examination of other agricultural extension systems? How do these systems compare, and what are their relative merits for a developing country? Students will be asked to design a model system for Yemen, drawing on the lessons from other systems. What are the systems currently operative in Yemen? What are their commonalities and differences? How does Yemen fit in the development of agricultural extension worldwide?

-- **Policy Development in Agricultural Extension**

Theories of policymaking. Steps in the policymaking process. How is policy for agricultural extension developed in Yemen? What are the steps in that process? What is the current policy for agricultural extension and what does it propose for national development? What are the implications of this policy for trade, food sufficiency, farmer income levels, and employment?

## ANNEX I

### The FOA Specialization in Agricultural

#### Economics (prepared by Lehman B. Fletcher)

This area represents both the potentials and pitfalls of curriculum development to date. As noted in the body of the report, the competencies identified for the three sub-areas in which this area is divided are well beyond those taught to agricultural economics majors in U.S. universities.

The course listing for the area is too long. It contains the following courses that are duplicated in the Faculty of Commerce and Economics:

- Principle of Economics
- Principle of Statistics
- Social and Economic Statistics
- Microeconomics
- Econometrics

These courses should be taken by FOA students in the other Faculty. In return, the FOA should staff the course in agricultural economic in the Commerce Faculty.

No course in intermediate Macroeconomics is included in the curriculum. Such a course is needed because macroeconomic and trade policies can have profound effects on development of the agricultural sector.

Two areas seem to be underemphaized. One is the economics of irrigation and water resources. Water is the most limiting resource in Yemeni agriculture and as such deserves more emphasis in the agricultural economics curriculum. The second is the organization, operation, and management of agricultural processing and marketing and input-supplying firms and industries. These agribusiness industries will become increasingly important as Yemeni agriculture becomes more commercialized and export-oriented.

ANNEX J

LOGICAL FRAMEWORK

Project Title: Faculty of Agriculture Subproject  
Agricultural Development Support Program

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<u>GOAL</u>	<u>Measures of Achievement</u>	<u>Means of Verification</u>	<u>Assumptions</u>
To increase rural incomes in the YAR through agricultural development.	<u>GOAL</u> Increased agricultural production. Improved agricultural trade balance. Increased farm income.	<u>GOAL</u> YARG statistics. Socio-economic analyses.	<u>GOAL</u> Agriculture will remain an important economic activity in rural Yemen.
<u>SUBGOAL</u> To increase the supply of appropriately trained Yemeni men and women to plan, manage, implement, and evaluate development activities in the private and public agricultural sector of the YAR.	<u>SUBGOAL</u> Increase in number of trained Yemeni men and women working in agriculture and rural development and a corresponding decrease in expatriates in key positions	<u>SUBGOAL</u> 1. YARG employment data. 2. MOE records. 3. MAF records on expatriate involvement in rural development	<u>SUBGOAL</u> 1. Incentive structure sufficient to attract Yemeni personnel to employment in the agricultural sector and to retain trained Yemeni personnel in the YAR. 2. There will continue to be a demand for trained Yemeni personnel in the agricultural sector.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<u>PURPOSE</u>	<u>END OF PROJECT STATUS</u>	<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
<p>To support the establishment within the University of Sana'a Yemen's first Faculty of Agriculture that is responsive to private and public sector development, and has appropriate linkage to the agriculture sector's production and institutional structure.</p>	<ol style="list-style-type: none"> <li>1. An operational indigenous Faculty of Agriculture within the University of Sana'a engaged in teaching and research, and assisting MAF extension activities.</li> <li>2. Four hundred-eighty students trained and graduated, and assuming responsible positions in the private and public sector, and an established institutional capability to produce 120 graduates per year.</li> <li>3. Ongoing collaboration between the Faculty of Agriculture, the MAF, the MOE, private agencies and agricultural producers on:               <ol style="list-style-type: none"> <li>a) research and research priorities</li> <li>b) extension</li> <li>c) curriculum development</li> <li>d) in-service training</li> </ol> </li> <li>4. A productive and ongoing relationship between the Faculty of Agriculture and U.S. Land-Grant University Faculties of Agriculture.</li> <li>5. An operational instructional farm that is integrated into the curriculum of the Faculty of Agriculture and is providing students opportunities for relevant, practical experiences.</li> </ol>	<ol style="list-style-type: none"> <li>1. Project evaluation reports.</li> <li>2. University/Faculty of Agriculture records.</li> <li>3. Follow-up surveys of graduates.</li> <li>4. Lists from U.S. Land-Grant Universities of seminars, special courses, and TDYs to support relationships with the Yemeni FOA.</li> <li>5. Formative evaluations in the context of annual workplans and other existing project reporting fora.</li> </ol>	<ol style="list-style-type: none"> <li>1. University of Sana'a policies will continue to support the development of a Faculty of Agriculture.</li> <li>2. Adequate facilities not funded by AID will be funded by 6/1/85 and available for use by 6/1/89.</li> <li>3. Faculty of Agriculture will be successful in recruiting and graduating students in projected numbers.</li> <li>4. Private and public agencies in the YARG, particularly MAF and MOE, will continue to be supportive of an indigenous Faculty of Agriculture.</li> <li>5. Incentive structure for faculty will continue to attract and retain qualified personnel for the FOA.</li> <li>6. Sana'a University will receive adequate budgets from the YARG, University tuition, and/or other donors.</li> <li>7. University FOA policies, personnel, and budgets will be implemented during and after project in accordance to the schedule as outlined in the budget.</li> <li>8. University/FOA facility and equipment maintenance and replacement policies will be implemented during and after the project.</li> </ol>

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<u>INPUTS</u>	<u>QUANTIFIABLE INDICATORS</u>	<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
1. AID grant of \$22.6 million over 11 year period (FY84-94).	(See budget)	1. AID Project Agreement(s). 2. YARG budget and records of budget allocations.	1. AID grant to support architectural and engineering services for the design and supervision of facility construction will be approved and released in a timely manner.
2. YARG contribution of YK 148 million over same period.	(See budget)	3. University records. 4. CID contract	2. Other donor funding of facility construction will be approved and released in a timely manner.
3. Implementation contract with CID.			3. AID, YARG, and other donor commitment to supporting project remains strong throughout life-of-project. 4. Land for the Faculty of Agriculture and Instructional farm will remain available. 5. The campus of the Faculty of Agriculture and particularly the instructional farm will not be negatively affected by urban encroachment.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<u>OUTPUTS</u>	<u>MAGNITUDE OF OUTPUTS</u>	<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
<p>1. An appropriate and flexible administrative/organizational structure which can accommodate projected growth in the Faculty of Agriculture and changes in the country's agricultural sector.</p> <p>2. Trained Yemeni faculty capable of instructing at the B.S. level, conducting research on priority Yemeni rural development issues, and assisting other institutions in extension.</p> <p>3. A flexible co-educational curriculum that is responsive to the training needs of the YAR.</p> <p>4. An agricultural sciences library.</p> <p>5. Agricultural sciences laboratories.</p> <p>6. An instructional farm on the university campus.</p> <p>7. Graduates at the B.S. level.</p> <p>8. Programs for in-service and refresher training for professional agriculturalists in the private and public sector.</p> <p>9. Faculty exchanges, seminars, and other evidence of relationships developed with the U.S. Land-Grant University Faculties of Agriculture.</p>	<p>1. One administrative/organizational structure.</p> <p>2. Yemeni faculty trained in the following fields:</p> <ul style="list-style-type: none"> <li>a) 7 in livestock and poultry production and protection.</li> <li>b) 7 in crop production and protection</li> <li>c) 3 in agricultural economics</li> <li>d) 6 in hydrology and agricultural engineering</li> <li>e) 3 in agricultural education/Extension Methods</li> <li>f) 3 in food science and technology</li> <li>g) 1 in library science</li> <li>h) 1 in ESI/Technical Agriculture</li> </ul> <p>3. One co-educational curriculum.</p> <p>4. One library.</p> <p>5. Instructional and research laboratories in the following areas:</p> <ul style="list-style-type: none"> <li>a) animal and poultry science</li> <li>b) plant sciences</li> <li>c) agricultural mechanics</li> <li>d) soil science</li> <li>e) agricultural and product processing</li> <li>f) food science and technology</li> <li>g) agricultural media preparation</li> </ul> <p>6. 120 B.S. graduates per year.</p> <p>7. Two in-service training courses per year</p>	<p>1. Project evaluation reports.</p> <p>2. Project training and other records.</p> <p>3. Site inspections.</p> <p>4. University records.</p> <p>5. Lists from U.S. Land-Grant Universities of seminars, special courses, and TDYs to support relationships with the Yemeni FOA.</p>	<p>1. Quality participants are available for training, will meet English language requirements, will complete training as scheduled, and will return to specified faculty positions.</p> <p>2. Adequate facilities will be funded by 6/1/85 and available for use by 6/1/89.</p> <p>3. Adequate water will continue to be available to support operation of facilities, including instructional farm.</p> <p>4. Only minimal remedial education will be required of prospective Faculty of Agriculture students.</p> <p>5. U.S. Land-Grant Universities will develop and nurture university relationships with the Yemeni Faculty of Agriculture.</p>

## ANNEX K

Republic of Yemen  
Sana'a, University  
Faculty of Agriculture

### TASKS AND INPUTS PLAN OF THE FACULTY OF AG. FOR THE ACADEMIC YEARS 1990/91-2000/2001

#### INTRODUCTION:

No doubt, agriculture was, and still is, the backbone of the Yemeni economy. This fact implies that the progress of the Yemeni community in all fields is rather dependant on the ability to bring about real development, at suitable rates, in all the agricultural and rural activities trough the direct support of agriculture and the introduction of the appropriate volume of investments, represented by the materiel and human resources, such as the agricultural inputs and the qualified cadre, which is capable of managing the agricultural sector through sound scientific methods, which, in turn, will lead to making the best use of our mnatural resources.

The human element, in any national economy, is the instrument and target of development. It constitutes the element that controls all other production elements. Basically, development aims at enabling the individual to obtain the optimum amount of commodities and services and at attaining social prosperity and psychological satisfaction. generally, the advanced countries aim at promoting the

standard of efficiency of its human element through the establishment of training and educational programs. In a society like Yemen, agriculture assumes an immensely important role, which entails the necessity of bringing up a generation of agriculturists, capable of producing real rural development. This is the reason for which agricultural education is now taking its proper place among other kinds of education. It is being given more attention and larger investments. The endeavors exerted towards establishing and effectively enhancing higher agricultural education, represented by the Faculty of Agriculture in Sana'a University and Faculty of Agriculture in Aden University, is considered an extremely important step towards promoting the Yemeni agriculture sector.

### **HISTORICAL OVERVIEW:**

The Faculty of Agriculture in Sana'a University was established by republican resolution No. (51) of 1982, to participate effectively in qualifying students to work in the Ag. sector and to graduate specialist in this field to promote Ag. production and expedite the comprehensive Ag. development process.

Classes in the Faculty of Agriculture started in the academic year 84/85 of 1990/91, the faculty ascribes part of the buildings of the Faculty of Commerce and Economics. It is supposed to sight to its buildings which are now under construction, in the academic year 1991/1992. The faculty new building was designed in such a way to satisfy all the educational, research and Agriculture extension. Additionally, there is an instructional farm occupying an area of 45 hectares. The farm encompasses experimental fields for the cultivation of farm, vegetable and fruit crops. Besides, there are sheds for the rearing of livestock and poultry. At present, only 13 hectares of the farm are being utilized, but, in future, when capabilities are made available, new additions of land will be made to these 13 hectares.

When the faculty started in September 1984, only 12 male and female students joined it. This number gradually increased until it reached, in September 1989, 144 students. (Table 1).

The first group of 5 students graduated from the faculty in May 1988. However, the total number of graduates during the period May 88 and March 90, was 79 (table 2).

When the Faculty shifts to its new building, it is presumed that it shall have around 800 students in the various stages.

### **PLAIN'S OBJECTIVE:**

This plan aims at identifying the major elements of the tasks and inputs of the Faculty of Agriculture, Sana'a University, through:-

- (1) Accurately identifying the major tasks, functions and activities, which are to be handled by the Faculty of Agriculture, derived as such from the realities and objectives of the Yemeni agriculture and the conditions of the Yemen society.
- (2) Cognate the material and human inputs, which are to be provided for the Faculty of Agriculture, if it has effectively to perform the functions, tasks and activities, with which it is entrusted.

### **IDENTIFYING THE TASKS, FUNCTIONS AND ACTIVITIES:**

The tasks, functions and activities, which are to be handled by the Faculty of Agriculture, may be determined as follows:-

- (1) **HIGHER AGRICULTURE EDUCATION:** This is the first objective of the faculty, i.e. to produce B.S. graduates in agriculture sciences in the light of the country's needs of agriculture specialist, with good scientific standards, that would enable them to effectively participate in the development of Yemen agriculture. Agriculture education in the faculty is limited to following specialized departments:-
  - Plant Production Department:- Which includes specializations in Crops and Horticulture.
  - Animal Production Department
  - Soil and Agriculture Mechanization department.

Economics and Agriculture Extension Department.  
Food Sciences and Technology.

The above specialized departments shall be opened after the completion of the buildings and labs, and after capabilities are made available.

- (2) **HIGHER STUDIES:** This means specialized higher agricultural studies in the above mentioned fields, through the initiation of suitable scientific programs to promote the capabilities of the faculty and satisfy the needs of the agricultural sector. These may be in the form of higher diplomas, MS degrees or Ph.D. such programs should be made an integral part of the faculty's talks, supposed to start in the academic year 1990/92.
- (3) **AGRICULTURE RESEARCH:** This shall be carried out through agriculture research plan, which is being developed annually, for the purpose of benefiting from the laboratory, farm and research potentials, and from the expertise of the staff members and researchers. Any support rendered to such research field shall have more positive effects if jointly started with the higher studies.
- (4) **TRAINING AND AGRICULTURE EXTENSION:** The role of the Faculty in the process of agricultural development shall, no doubt, extend beyond the walls of its compound to the agriculture community, by extending to it the necessary training and extension services and conducting regular training programs for those involved in the various fields of agriculture. It is planned for the faculty to conduct two training programs per academic year, and also to extend its extension services to the maximum number of Ag. authorities, corporations and farmers. This shall be conducted through the laboratory and research capabilities of the faculty and the expertise of its staff.

## MAN POWER INPUT PLAN:

### INTRODUCTION:

The Faculty's manpower input plan encompass two parts; material and human. The assessment of such needs is based on the faculty's tasks, functions and activities that will begin in 1991/92, the year when it will shift to its new buildings, until the year 2000/2001. This plan was developed in consistence with comprehensive national plans. The 3rd -5 year plan, in fact, ends up in 1991 after which the 4th - 5 year plan will begin to cover 1992-1996 to be followed by the 5th 5-year plan for the years 1997 - 2001. In the field of manpower, the faculty needs were assessed as follow:-

- \* Staff members and supporting personnel (teaching assistants).
- \* Technicians.
- \* Administrators.
- \* Laborers.

### BASIS OF ASSESSMENT:

Classes in the Faculty of Agriculture started in 1984/85 in the buildings of the faculty of commerce and condoms. In 1991/92 the faculty will shift to its new buildings and will accommodate 800 B.S. students. The faculty contains five different scientific regulations of the faculty. Table (3) shows the scientific plan of the faculty from 1990/91 until end of 2001. The assessment of the faculty's needs of manpower of that scientific plan was based on:-

- \* Demonstrating the development in establishing additional branches for specialization, or offering the opportunity to join higher studies in such specializations.
- \* The development that tasks place in the number of students, who will be admitted to B.S. or higher studies levels.

Expansion in the tasks and activities of the faculty in education, training, research, extension and environmental services.

Additional responsibilities entrusted to staff members and others with regard to the components of the faculty's needs of manpower as a result of the above mentioned consideration.

The need of manpower, asset up in tables 5-11, was derived through the quantitative interpretation of the above considerations and in the high of estimation of the number of students in the various stages (table 4)

**PRESENT NUMBER AND ESTIMATED NEEDS OF STAFF MEMBERS AND SUPPORTING PERSONNEL:** Posts of the faculty staff members include those local or expatriates, who have Ph.D. degrees and are engaged as professors, associate professors and instructors.

According to the statements of the academic year 1989/90, as shown in (table 5), the number of staff members was 21, distributed as follow:-

- 7 Professors
- 8 Associate Professors.
- 6 Instructors.

From the same table, the number of local members was 9, while the number of the visiting (on secondment) professors was 12, which means that the local constitute only 43% of the total number of the staff members of the faculty. According to the scholarships and national substitution plan, and that of the educational research and extension activities, it is expected that this percentage will persist all throughout the planned period.

Table 5 shows the estimated need of staff members during 1990/91, 1991/92 - 1995/96 and 1996/97 - 2000/2001.

From the above table, it appears that the need of the faculty of staff members during the plan period will increase from 21, (1989/90 the base year) to 27 members during 1990/91 and then to an average of 51 during the years 1991/92 - 1995/96. For the last five years, i.e. 1996 - 2001, the average will be 78 staff members.

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Regarding the supporting posts, i.e. instructors and assistant instructors table (70 shows their number during 1989/90 is 15, out of which 3 are visiting (on secondment) and 12 locals. the evaluation of the need of such personnel, during the planned period, shall be assumed to be filled with locals only, with effect from beginning of the five years 1991/1992 - 1995/1996. Table (8) shows the evaluation of the faculty's need of instructors and assistant instructors during the planned period. their number will increase from 15 (in 1989/90 base year) to 51 during the year 91/92 and then to an average of 74 during the years 91/92 - 95/96 and finally to an average of 116 during the years 96/97 - 2000/2001.

#### PRESENT NUMBER AND ESTIMATED NEEDS OF TECHNICAL, ADMIN AND LABORERS POSTS.

In addition to the basic educational staff members, the faculty shall also need an appropriate number of complementary posts, such as technicians, administrators, workshop and Ag. laborers. In addition it shall need personnel to run and control the accounts, students' affairs, files and records,. Ordinary laborers shall also be needed as guards, janitors, peons, farm mates etc.,

Table 9 shows the number of these categories that are directly related to the Scientific Departments of the faculty, in accordance with 1989/90 survey. It also shows the need for such categories on the transfer of the faculty to its new buildings in 1991/92 until the end of planned period.

The same table shows that in 1989/90, there are 12 technicians and 4 laborers, but no administrators that relate directly to the Scientific Departments. the number of technician is expected to increase to an average of 18 and 54 during the two periods of the plan, i.e. 1991/92 - 1995/6 and 1996/7 - 2000/2001, respectively. similarly, the number of administrators shall increase at an average 22 and 32 over the same two periods of the plan. Laborers number shall increase at an average of 40 - 59, respectively.

## PRESENT NUMBER AND ESTIMATED NEEDS OF TECHNICAL AND ADMIN PERSONNEL:-

In addition to the available resources of the faculty departments of manpower and material requirements, the general management also requires similar manpower through which it may run the scientific facilities, such as the central labs, the auditorium, the farm, student's affairs, accounts, personnel, warehouses, procurements, the off-set press, maintenance etc....

Table 10 shows the available resources of the above requirements during the academic year 1989/90, which are rather adequate for the time being. Under this transitional stage, the additional requirement that are to be provided for are shown in Table 11 at averages for the planned period, starting the year of transfer of the faculty to its new buildings, i.e. the academic year 1991/92.

## THE MATERIAL REQUIREMENTS PLAN:

The material requirements plan of the faculty involves various operational items, educational and research inputs and other requirements that are directly or indirectly related to the basic functions of the faculty, in general, i.e. the educational, research, training and extension.

Since it was difficult to identify those inputs due to the diversity of the items and the overlapping of their use by the various departments or the various activities, it was deemed appropriate to evaluate those requirements in terms of their cash value, consistent to the method used during the previous years and in expectation of expansion in future in the educational, research, training and extension activities. However, the estimated inflation factor for the future was also taken into consideration for the whole planned period.

TABLE NO. 1: NUMBER OF STUDENTS ENROLLED IN THE FACULTY  
DURING THE PERIOD SEPT. 1984 - SEPT. 1989

<u>Date of Enrollment</u>	<u>No. of Students (Male)</u>	<u>No. of Students (Female)</u>	<u>Total</u>
Sept. 1984	11	1	1
Feb 1985	53	1	54
Sept. 1985	69	5	74
Feb. 1986	49	2	51
Sept. 1986	83	-	83
Sept. 1987	140	7	147
Sept. 1988	149	10	159
Sept. 1989	<u>139</u>	<u>5</u>	<u>144</u>
TOTAL	693	31	724

NUMBER OF FOA STAFF MEMBERS  
DURING THE ACADEMIC YEAR  
1989 - 1990

Scientific Dept.	Prof.		Prof.		Instructor	
	Loc.	Exp	Loc.	Exp	Loc.	Exp
Eco. & Ag. Extension	1	1	-	2	-	-
Food Sci. & Technology	-	-	-	1	-	-
Soil & Ag Mechanization	-	1	-	-	1	-
Plant Production	-	3	2	3	3	-
Animal Production	-	1	-	-	2	-
	-----		-----		-----	
Total	1	6	2	6	6	-
	=====		=====		=====	

Grand Total = 21

Locals = 9

Expats = 12

TABLE NO. 1: NUMBER OF STUDENTS ENROLLED IN THE FACULTY  
DURING THE PERIOD SEPT. 1984 - SEPT. 1989

<u>Date of Enrollment</u>	<u>No. of Students (Male)</u>	<u>No. of Students (Female)</u>	<u>Total</u>
Sept. 1984	11	1	12
Feb. 1985	53	1	54
Sept. 1985	69	5	74
Feb. 1986	49	2	51
Sept. 1986	83	-	83
Sept. 1987	140	7	147
Sept. 1988	149	10	159
Sept. 1989	<u>139</u>	<u>5</u>	<u>144</u>
TOTAL	<u>693</u>	<u>31</u>	<u>724</u>

Table No. 10:

The Technical, Admin and Labor Structure of FOA  
Academic Year 1989/90

<u>Description</u>	<u>No.</u>
FOA Dean	
D/Dean	
FOA Project Team Leader	
Controler	1
Farm Manager	1
Farm Co-Manager	1
Registrar	1
Student Affairs	1
Archives Clerk	1
Accountant	1
Typist	1
Driver	3
Technicians	7
Temporary Laborers	5
Farm Engineer	3
Farm Technicians	7
Tractor Operator	1
Farm Asst. Mechanic	1
Janitor	1
Farm Laborers	9
Guards	2
Seasonal Laborers	2

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Table No. 11:

FOA Additional Requirements of Technical, Administrative  
and Labor Manpower in the Average Planned Period  
1991/92 - 2000/2001

<u>Description</u>	<u>No.</u>	<u>Remarks</u>
Assistant Supervisor	1	FOA Administration
Typist/Technician	2	" "
Computer Technician	2	" "
Filing Specialist	2	" "
Offset Printing Technician	1	" Printing Press
Offset Printing Operators	3	" " "
Admin. Affairs Specialist	1	" Administration
" " "	1	" Farm
Student Affairs Administrator	3	" Administration
Librarians	5	" Library
Planning & Follow-up Administrator	1	" Administration
In-Charge of Financial Affairs	1	" Accounting Unit
Accountant	1	" " "
Cashier	1	" " "
Chemicals & Seeds Store Keeper	1	
Agric. Machinery Store Keeper	1	
Animal Production Supplies Store Keeper	1	
Purchaser, for Departments	1	
Purchaser, for Farm	1	
Farm Sales Agent	1	
Asst. Farm Manager	2	FOA Farm
Farm Section Supervisors	8	" "
Farm Laborers	20	" "
Farm Secretaries	2	" "
Farm Guards	8	" "
Farm Janitors	2	" "
Farm Cafeteria Manager	1	" "
Nurseries Laborers	4	" "
Janitor	7	FOA
Cafeteria Manager	4	"
Mosque Custodian	1	" Mosque
Library Laborers	5	" Library
Guards	2	Ag.Mech. Buildings
Technical Supervisor	1	" " "
Mechanization Unit Director	1	" " "

Table No. 12:

Estimated Annual Expenditure Appropriations of FOA  
Project for FY 1990 - 1998, in Thousand US \$

<u>Fiscal Year</u>	<u>Estimated Expenditure (in Thousand US \$)</u>
1990	3075
1991	3375
1992	2625
1993	2180
1994	2015
1995	1200
1996	350
1997	50
1998	<u>0</u>
	Total: 14,870

Source: FOA Annual Work Plan, FY 1990, P. 23

TABLE NO. 9: CURRENT AND ESTIMATED NUMBER OF COMPLEMENTARY  
 JOBS CATEGORIES (TECHNICIANS, ADMINISTRATOR,  
 LABORERS) AT THE VARIOUS DEPARTMENT IN FOA

PERIOD	Academic Year 1989/1990			Average 91/92 - 95/96			Average 96/97 - 2000/2001		
Department	Tech- nicians	Admin. instrator	Laborer	Tech- nicians	Admin- strator	Laborer	Tech- nicians	Admin- strators	Laborer
Ag. Econ. & Ext.	-	-	-	2	2	1	4	3	2
Food Sci. & Techno.	-	-	-	11	4	2	14	7	3
Soils and Ag. Mech.	3	-	-	5	4	2	5	4	2
Plant production	6	-	-	20	9	27	21	15	40
Animal production	3	-	4	10	3	8	10	3	12
	12	-	4	48	22	40	54	32	59

TABLE NO. 6 ESTIMATED NUMBER OF FOA  
STAFF MEMBERS 1990/91 -2000/2001

DEPARTMENT	PERIOD	1990/91			AVERAGE			AVERAGE		
		PROF.	ASSOC. PROF.	INSTRUCTOR	PROF.	ASSOC. PROF.	INSTRUCTOR	PROF.	ASSOC. PROF.	INSTRUCTOR
AG. ECON. & EXT		2	2	-	2	3	-	4	5	2
FOOD SCI. & TECH.		-	2	-	-	2	1	-	2	1
SOILS & AG. MECH.		1	-	1	3	4	1	3	4	1
PLANT PROD.		3	7	3	6	9	7	9	12	11
ANIMAL PROD.		2	-	4	4	4	5	4	9	11
<b>TOTAL</b>		<b>8</b>	<b>11</b>	<b>8</b>	<b>15</b>	<b>22</b>	<b>14</b>	<b>20</b>	<b>32</b>	<b>26</b>
PERIOD TOTAL			27			51			78	

TABLE NO. 8

ESTIMATED NUMBER OF ASST. INSTRUCTORS AND TEACHING  
ASSISTANTS IN FOA DURING THE PLANNED PERIOD 1990/91 - 2000/2001

PLANNED PERIOD SCIENTIFIC SECTION	1990/1991		AVERAGE 1991/1992-1995/1996		AVERAGE 1996/1997 - 2000/2001	
	ASSISTANT INSTRUCTOR	TEACHING ASSISTANT	ASSISTANT INSTRUCTOR	TEACHING ASSISTANT	ASSISTANT INSTRUCTOR	TEACHING ASSISTANT
AG. ECON. AND EXTENSION	-	4	-	7	4	10
FOOD SCIENCES & TECH.	-	3	2	13	2	18
SOILS & AG. MECHANIZATION	2	4	2	8	2	14
PLANT PRODUCTION	2	9	10	18	13	26
ANIMAL PRODUCTION	2	5	5	9	8	14
TOTAL	6	25	19	55	34	82
GRAND TOTAL FOR PERIOD		31		74		116

TABLE (2): NUMBER OF F.O.A. GRADUATES DURING  
THE PERIOD MAY 88 - MARCH 90

<u>Graduation date</u>	<u>No. of Male Graduates</u>	<u>No. of Female Graduates</u>	<u>Total</u>
May 1988	4	1	5
Jan. 1989	15	1	16
May 1989	10	1	11
Sept. 1989	15	2	17
Feb. 1990	16	1	17
Mar. 1990	<u>13</u>	<u>-</u>	<u>13</u>
TOTAL	<u>73</u>	<u>6</u>	<u>79</u>

**TABLE (3): F.O.A. SCIENTIFIC PLAN FOR THE PERIOD  
1990/1991 - 2000/2001**

Academic Year	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/2000	2000/2001
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**(1) B.S. LEVEL:-**

**Cross Specialization**

- Horticulture
- Animal Production
- Ag. Eco. & Co-operation
- Ag. Extension
- Food Sciences and Technology
- Soils
- Ag. Mechanization

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**(2) Higher Studies Level  
2 years Diploma in  
Higher Studies:**

- Crops
- Horticulture
- Animal Production
- Ag. Eco. & Co-operation
- Ag. Extension
- Food science & Technology
- Soils
- Ag. Mechanization

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**(3) M.S. Level**

- Crops
- Horticulture
- Animal Production
- Ag. Eco. & Co-operation
- Ag. Extension
- Food Sceinces & Technology
- Soils
- Ag. Mechanization

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## ANNEX L

### SECTION C: STATEMENT OF WORK FACULTY OF AGRICULTURE EVALUATION

#### I. Activity to be Evaluated

USAID/Yemen is contracting for an evaluation of the Faculty of Agriculture (FOA) subproject of the Title XII Agricultural Development Support Project (ADSP).

#### II. Purpose of the Evaluation

The purpose of the evaluation is to examine in detail the FOA subproject, providing recommendations to USAID Mission management, the contractor and the University of Sana'a on the ways in which the FOA activity can be more effectively used to establish and sustain a Faculty of Agriculture that is responsive to Yemen's agricultural needs, is supportive of private and public sector development, and has appropriate linkages to the agriculture sector's production and institutional structure. Future needs and requirements of the activity also need to be examined closely, within the context of the overall Mission strategy and recent AID/W policy directives.

#### III. Background

The \$30 million FOA activity is one of five subprojects in the \$135 million ADSP project.

Although the FOA subproject was not formally approved until March 1985, the need for such an activity was recognized as early as August 1979 in a baseline study conducted by the Consortium for International Development (CID) to help USAID formulate its long-term agricultural development strategy in Yemen. Late in 1980, Oregon State University (OSU) was assigned responsibility for developing this activity.

In the summer of 1981, a team of Yemeni officials representing Sana'a University, the Ministry of Agriculture and the Ministry of Education along with OSU officials conducted a study tour to define the parameters for the development of an FOA. The subsequent Project Paper (PP), approved in March 1985, envisaged technical assistance, training, instructional farm development, and limited commodity support for a new faculty and architectural and engineering services for the design and construction supervision of the campus.

Some parts of the PP were quickly overtaken by events. For example, formal establishment of the Faculty of Agriculture was envisaged by September 1986; this in fact occurred in September 1984, resulting in considerable pressure to speed up mobilization and implementation schedules. Initially, the staff consisted only of a Dean and Vice Dean. The first FOA team leader was assigned to the project in December 1985. The first class of 35 students enrolled in September 1984, five of whom graduated with BS degrees in agriculture in June 1988.

Developments over the past three years include completion of an instructional farm; provision of needed computers, books, and other equipment; support for provisional expatriate staff while Yemeni faculty are studying in US; long-term scholarships for eleven Yemenis in animal science, soil and water science, food science and agricultural education and extension; signing of a cooperation agreement between Oregon State University and Sana'a University to promote cooperation and exchanges; provision of workshops and other short-term training; and initiation of Islamic Development Bank and Saudi-funded construction of new campus for Faculty of Agriculture.

#### IV. Scope of Work

Discussion of the questions outlined below shall form the main body of the evaluation report and shall be used to guide the analysis. In the final report, the evaluation team shall present their findings (e.g. the evidence) relevant to each of the sub-sections. The final report shall also include the team's conclusions (e.g. their interpretation of the evidence) and their recommendations based on their best judgement.

##### 1. Strategic Planning and Development:

A. To what extent has FOA formed links with relevant outside groups potentially able to benefit (or benefit from) FOA (e.g. farmer groups; local, regional and national politicians; agribusiness and market organizations; service organizations such as educational institutes, research centers, advisory and consultant groups; governmental organizations associated with agricultural production, rural development, water resources, soil conservation, forestry, health, and community affairs; alumni; etc.)?

B. How are outside linkages of this kind used in the generation of strategic policies for the FOA in terms of the formulation of mission statements; curriculum development; research policies and resource allocation strategies; extension, outreach and continuing education; recruitment plans for students and faculty; strategies for seeking additional resources outside government?

C. To what extent and by whom are linkages being established that ensure the FOA is able to gather and share in "forefront" knowledge in scientific disciplines and technological developments important to agricultural and rural development? To what extent are such linkages being established in other relevant areas, such as theories of education, curriculum development, organization management, information technology, etc.?

D. What is the mission of the FOA as perceived by its Dean? How does this relate to his vision of the role of the FOA in the agricultural and rural development of Yemen?

E. To what extent is there a shared sense of mission among FOA staff? What role does the Dean play in developing this? What role do others on the Faculty play?

F. What is the mechanism for making decisions on Faculty policy (e.g. who decides what, how, when, and where)?

## 2. Long-Term Sustainability

A. What has been the annual ratio of University/USAID funding for the FOA from 1985 to 1989? What is the projected ratio, as perceived by USAID and the University, for the period 1990-1996? What is the projected level of funding required after 1996, as perceived by both USAID/OSU and the University?

B. What plans and/or planning does the University have for funding the FOA after 1996?

C. How is the role of the FOA in the development of North Yemen perceived by "influentials" in the University, government and private sector? What are the views of these people about the viability of the FOA when the projected USAID commitment ceases in 1996? What are the views of USAID and OSU officials on these questions?

D. How are the needs of the Ministry of Agriculture and Fisheries transmitted to the FOA? To what extent is it associated with the faculty and the particular programs developed? How is the FOA viewed by its major clients (e.g. the Ministry of Agriculture and Fisheries, Regional Development Authorities and farmers)? Is it meeting their needs? Do all three parties share a common view of the school's mission? Do students and the first graduates share this as well? Are these views reflected in the project's present purpose and goal and will the outputs produce this?

## 3. Curriculum

A. What is the long-term vision of the Dean and Faculty members of a family of undergraduate and postgraduate programs to be offered by the FOA? How are the programs to be related to each other and to the perceived mission of the FOA?

B. What programs are being offered at present? What are the aims of the programs and how are they related to the perceived mission of the FOA?

C. What is the educational strategy (e.g. the linkage of educational philosophy, theory and practices and program aims) on which the current curricula are based? How are they structured? What is the content? What resources, human and material, are used? How are learning experiences that are compatible with course aims designed, conducted and evaluated? How are students given access to learning resources? How are students counselled and challenged about their learning programs and overall development? What steps are taken to create a stimulating and active learning environment? How are students assessed and to what extent is this process compatible with the aims of the programs and mission of the FOA?

D. What is the pattern of student enrollments since 1985? What percentage of the students have been females? What have been the attrition rates? What are the requirements for entry to programs? What are the projected numbers of students in programs? How do the actual and project enrollments relate to the demand for graduates, both qualitatively and quantitatively? How can female participation be improved?

E. Are the FOA's programs formally accredited? If yes, which body does the accrediting and what is its standing nationally and internationally? What is the procedure for accreditation? What opportunities exist for introducing a process of accreditation?

F. What universities outside Yemen will accept the FOA's academic awards (for example, for entry to their post-graduate programs)?

#### 4. Research and Extension

A. In what way are research and extension functions included in the long-term vision of the role of the FOA held by the Dean and faculty members? How are they to be related to each other and the teaching function?

B. What research and extension functions are currently being carried out? What resources are accessible to faculty members to conduct research and extension? What incentives and disincentives to participation are there? What are the links to national research and extension programs and how can these be strengthened?

#### 5. Management Systems

A. What is the organizational structure of the FOA and how is it related to its function and mission?

B. What systems are in place for managing the finance, personnel and student administration functions of the FOA?

C. How is authority and responsibility for budgeting and control of resources allocated? What procedures are used to hold staff accountable for their areas of responsibility?

D. What criteria are used to evaluate the efficiency and effectiveness of the management systems? What information is collected to measure against these criteria? How is this used to improve management effectiveness?

#### 6. Staff

A. What criteria are used to determine staff work profiles (e.g. the ratio of administration, teaching, research and extension activity)? Who decides on the profiles and what process is used?

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3. How, and from whom, do staff receive feed-back on their performance? What criteria are used for promotion and what process is used to decide on promotions? What opportunities are provided for staff to develop their abilities, both personal and professional? Is the present system supportive of high staff morale?

C. What criteria are used to determine eligibility for academic and technical staff for employment and how does this relate to the mission of the FOA and the aims of the project? What process is used to recruit staff and who makes the decision to employ?

D. What is the ratio of Yemeni/expatriate academic and technical support staff and how does this compare with previous years? What plans are there to increase the proportion of Yemenis and what effect will they have?

E. How many Yemeni staff have completed or are receiving training through the project and in what disciplines? How does this compare with the project plan? If the two figures are out-of-line, what action is being taken to remedy this? How well are Sana'a University's parallel training efforts progressing?

#### 7. Instructional Farm and Library

A. What role is perceived for the farm by the Dean and faculty members in the teaching, research and extension functions of FOA?

B. How is policy on the use of the farm decided? What is the envisaged and actual role of the farm committee?

C. What use is currently being made of the farm for teaching, research and extension?

D. How, and by whom, is the budget for the farm decided and controlled? What plans exist to meet the recurrent funding needs of the farm? In this context, the team should assess the farm plan, record keeping and management functions.

E. How is the use of the farm incorporated into the curriculum? To what extent is this being achieved?

F. What reference books, periodicals, and audio/visual learning materials are in the library collection? What is the system for storage, retrieval and use? What library staff are there and how skilled are they?

#### 8. Academic Support Services

A. What technical and administrative support services (staff and equipment) are provided? How are needs for support services and plans to use available resources to meet the needs determined?

B. Who allocates and controls support resources (e.g. budget, staff, facilities, material)? Who coordinates and monitors the provision of support services and provides management information on them? Who is responsible for monitoring support staff performance, giving them feed-back and arranging training? Who are the coordinators, monitors and supervisors accountable to?

#### 9. Project Management

A. What is the pattern of contact between project team, FOA, University, and USAID staff?

B. Is there a project management information system which provides regular project information to managers on outputs, purposes, and goal achievements? Do managers use this information for project decision-making?

C. To what extent has the contractor been successful in accomplishing stated outputs of the project? Where stated outputs have not been achieved, what is the explanation? Does performance thus far support continuation with the existing contractor or lead university?

D. Is the logical framework consistent with the realities of the situation? Is the vertical logic of the project sound? Are the input, output, purpose, and goal plausible? To what extent have the inputs been provided and the outputs achieved as planned? To what degree are the inputs and outputs contributing to achievement of the purpose? Is technical information provided in the PP still applicable? Is the information indicated in the log frame and anticipated in outputs still valid?

#### J. Lessons Learned

A. What lessons have been learned about the design and implementation of this project thus far? If the evaluation team were to design this project over again, what would they do differently?

B. How can these lessons be applied during the remaining years of the project? What are the major decisions that need to be made to improve project effectiveness? Will the project attain its purpose by the PACD. Is an extension needed and, if so, what schedule is recommended in order to achieve it?

#### V. Methods and Procedures

The final evaluation report shall be based on a review of the existing literature (Project Paper, contractor reports, government documents, project files, etc.), an inspection of FOA facilities, and interviews with key individuals, including appropriate FOA, contractor, and USAID staff.

The one-month evaluation exercise shall incorporate the following steps

-- Orientation in Sana'a, including team planning meeting at USAID; review of project documentation; tour of FOA and initial meetings with FOA and contractor staff.

-- In-depth interviews with FOA and contractor staff; more detailed review of FOA facilities, as appropriate.

-- Continued in-depth interviews with FOA and contractor staff; more detailed review of FOA facilities, as appropriate.

-- Report writing, follow-up interviews with appropriate officials as necessary.

-- Presentation and finalization of report in Sana'a.

The contractor shall coordinate arrival and departure times of team members to ensure that the team remains intact throughout the course of the evaluation. Members of the evaluation team are (1) authorized to spend two days in Washington DC to visit AID/W's Asia Near East Bureau's Technical Resources, Agricultural and Rural Development Office (ANE/TR/ARD) and AID/W's Center for Development Information and Evaluation (CDIE) in order to discuss and review prior A.I.D. experience in assisting and establishing higher education agricultural institutes in LDCs; and (2) communicate (via telephone or telex) prior to departure for Yemen with the contractor and lead university, Consortium for International Development and Oregon State University.

Formal meetings in Yemen at a minimum shall include an initial orientation and team planning meeting at USAID in Sana'a; a status report to Mission staff halfway through the time in Yemen; and a close-out presentation no fewer than two days prior to departure from Yemen. Additional meetings with USAID staff, FOA 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 three weeks after the team departs post. The contractor shall send by courier not less than two final copies of the evaluation not less than five weeks after departure from post. An entire package of not less than thirty copies of the final evaluation report shall be pouched to the Mission by the contractor at the same time.

## VI. Team Composition

The core evaluation team mobilized under this solicitation shall consist of three individuals, qualifications for which are highlighted below:

1. University Management/Institutional Sustainability Specialist (Fletcher): PhD in relevant field; at least seven years of management experience in agricultural institutions similar to those supported under FOA; at least five years overseas experience in relevant field.

2. University Curriculum Development Specialist (Rivera): MA/MS in relevant field; at least five years of prior experience in agricultural curriculum development that includes links with teaching, research and extension; at least three years overseas experience in relevant field.

3. University Agricultural Research and Extension Specialist (Crowder): MA/MS in relevant field; at least five years of prior management experience in project involving both research and extension, preferably in a context similar to that being pursued under FOA; at least three years overseas experience in relevant field.

The management/institutional sustainability specialists shall also be designated as team leader, with full responsibility for drafting and presenting the final report.

USAID/Sana'a may independently arrange for one or two additional resource persons with relevant university experience from other Arab countries in the region to join the evaluation team. A YARG or FOA official may also formally participate in the evaluation.

If recruited, these additional individuals would play an ancillary role in the overall evaluation process, acting as resource persons (particularly in the area of sustainability and curriculum development) for the core team contracted for under this solicitation. Irrespective of which additional resources may be provided, the three-member core team contracted for under this solicitation will remain fully responsible for all aspects of the evaluation, including collection of data and drafting and presentation of the final report.

## VII. Reporting Requirements

The final report shall include the following sections:

1. Executive Summary of not more than five pages summarizing the main findings, conclusions, and recommendations. The Executive Summary shall also state the development objectives of the activity, purpose of evaluation, and methods and procedures used.

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

3. Table of Contents

4. Main Body of Report, not to exceed sixty double-spaced pages of text. This main section shall include a brief description of the country context in which the project was developed and implemented; team composition and study methods; and information (evidence and analysis) on the issues raised in the SOW. The report shall conclude with a full statement of findings, conclusions and recommendations. Conclusions should be short and succinct, with the topic identified by a short sub-heading related to the questions

posed in the SOW. Recommendations should correspond to the conclusions; whenever possible, the recommendations should specify who, or what agency, should take the recommended action.

5. Annexes, to include at a minimum a complete copy of the evaluation SOW; a list of documents and individuals consulted, along with institutional affiliations; and the pertinent Logical Framework together with a brief summary of the current status/attainment of original or modified inputs and outputs.

#### VIII. Other Provisions

Duty post in Yemen is Sana'a. Access to classified information will not be required. USAID's Office of Agriculture will provide basic logistic support, including hotel reservations and transportation within Sana'a as requested. Contractors are advised to bring their own computers and provide for secretarial support as required. Six day work weeks are authorized. The evaluation should begin on or about May 15 and conclude on or about June 15, 1990.

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