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REPORT OF THE MID-TERM

EVALUATION TEAM

The Jamaican Agricultural Education Project

AID Project No. 532-0082

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EXECUTIVE SUMMARY

PURPOSES AND METHODOLOGY

The purposes of the Jamaica Agricultural Education Project which was evaluated are to:

1. develop and expand the Jamaica College of Agriculture (COA) at Passley Gardens; and

2. expand and improve the secondary agriculture school at Knockalva (KAS).

The purpose of the evaluation was to determine to what extent initial project objectives had been and/or could be achieved, how well the cooperating agencies were performing their roles within the project, and in what manner project activities should continue. The evaluation was carried out by a six person team including the USAID project officer, a representative from each of the Jamaican Ministries of Agriculture and Education, and Associate Deans of Agriculture from Hawkesbury College, Australia, and Oregon State University, U.S.A. The team interviewed USAID staff, Jamaican government officials and private entrepreneurs in Kingston; faculty, students and administrators of the COA at Port Antonio; Louisianna State University Agricultural Consortium team members; and Knockalva and Elim faculty, students and administrators, at their respective locations.

FINDINGS AND CONCLUSIONS

The Jamaica College of Agriculture is a vital institution to Jamaica's economic development. Furthermore, because of the importance of the COA's and its predecessor's (the Jamaica School of Agriculture's) graduates in the leadership of the country, the COA's continued progress is essential to the social and political well-being of the society. Toward that end, a superior quality and quantity of technical assistance has been provided to the Jamaican Agricultural Education Project by the Louisiana State University Agricultural Consortium including Southern University and Sam Houston State University. This technical assistance is increasingly benefitting the College of Agriculture as modes of interaction among parties to the JAEP and COA management improves.

However, considerable effort needs to be made in order to fully utilize the backlog of policy, procedural, technical and informational manuals and documents provided the COA through technical assistance. Similarly, there has been a lag in construction, participant training and applied research. Extension and outreach activities and curriculum development have proceeded at a faster pace than other components of the project, largely through initiative and leadership of the Technical Assistance Team but require improvement in quality and respect to their support of, and relationship to, Jamaican institutions. Nevertheless, there now appears to be momentum in all aspects of the project, although stronger in some than in others.

Three problem areas that have contributed to slow build-up of momentum in the JAEP, which will continue to require urgent, cooperative attention of the LSUAC, USAID and MOE are: (1) a severe financial crisis in operating budget at the COA, (b) deficiencies in communication and working relationships among and within the cooperating parties of the JAEP which largely reflect a deficiency in operating principles and systems rather than lack of good will,

(c) incongruity of curriculum, graduate certification, and qualifications for advanced education among the Agricultural Schools, the COA, the former Jamaica School of Agriculture, and the University of the West Indies. Problems of graduate certification affects employment of graduates, morale of faculty and students, relationships of the present institutions within Jamaican politics and society, progress with the JAEP and the long-term viability and functions of the COA.

The College of Agriculture and the Agriculture Schools of Elim and Knockalva are vital institutions to Jamaica. The Jamaican Agricultural Education Project is essential to their development and is synonymous with the provision and development of agricultural education in Jamaica. Elim and Knockalva Schools are financially sound and well-administered. Their faculties are exceptionally competent and dedicated and offer a high quality education to students of strong capability, morale and ambition. The College of Agriculture, the youngest of the institutions, yet falls short in most of these respects. Nevertheless, the COA is a vital institution to Jamaica; agricultural progress depends upon this institution. It must not be allowed to fail.

With the same confidence that these problem areas have been identified, the review team recommends certain actions which we believe will lead to the achievement of project goals.

RECOMMENDATIONS

General

1. In total, evaluation suggests that to better assure the health and progress of Jamaican Agricultural Education as a whole, the Jamaican Agricultural Education Project be extended for one year to August 31, 1991. The significance and scope of the Project and the projected stage of development when the Project ends on August 31, 1990 lead us to conclude that a follow-on project should be considered by AID.

2. A high level committee should establish equivalency or a process for granting equivalency between the degrees, diplomas or other certifications awarded by the Jamaica School of Agriculture and College of Agriculture A.Sc. degrees. This measure will facilitate academic and professional advancement of JSA graduates, including those who are COA and Agricultural school faculty and provide beneficial continuity between the JSA and the COA.

3. We further suggest that upgrading of the College of Agriculture to a B.Sc. granting institution, and of Elim and Knockalva Agricultural Schools to A.Sc. degree-granting institutions are warranted, and that programs of the JAEP be directed in a carefully planned manner toward these goals. A target date for upgrading the COA, Elim and Knockalva, shortly before or beyond August 31, 1991, would do much to rationalize the teaching, research and outreach programs of these institutions, with respect to Jamaica's needs and with respect to the high expectations set for the institutions under the JAEP. Such a planned effort would measurably assist improvement in the three problem areas, by providing goals that more realistically reflect the level of financial, intellectual and institutional building effort required to realize the objectives of the JAEP.

4. The evaluation team also suggests that the LSUAC put in place collaborative mechanisms between LSUAC and Jamaican institutions that will help sustain Jamaican Agricultural Education beyond the end of the Project (e.g. Memorandum of Understandings on faculty exchange, journal exchanges, library book acquisitions, etc.).

Applied Research

1. The Research Review Policy should be implemented as is, rather than wait for further revisions.

   a. A revision to include criteria for the review of proposals and release of results should be added later.

   b. A policy amendment that would support greater managerial independence and flexibility of the Associate Dean for Research and Development in financial resource acquisition and allocation is also encouraged.

2. The Associate Dean for Research and Development, with the support and assistance of the TAT, should initiate collaborative research relationships with the Ministry of Agriculture, Commodity Boards, International Agricultural Research Institutes, and other agencies.

3. The Associate Dean for Research and Development, with support and assistance of the TAT and the PIU, should plan research for the commercial farm at Spring Garden to meet requirements for the farm's development.

4. Long-term and short-term applied research plans should be formlated for the COA. At a minimum, such plans should include projected technical assistance by research areas one year in advance, and the level of effort of the TAT and COA. The TAT effort should be aimed at strengthening COA faculty leadership and initiative in research. The plan should be formulated and approved by all research participants, as a part of an annual Project Work Plan.

Extension

1. The position of Extension Coordinator for which the College is now recruiting, should be filled promptly. With support and supervision of the Associate Dean for Research and Development, and support and assistance of the TAT, the incumbent should formulate a long-term plan of work.

2. A one-year plan of work should be developed and annually revised, which reflects all extension activities. This Annual Work Plan should identify schedules of TAT contributions and their expected contributions in relation to initiatives of the College of Agriculture.
3. The Rio Grande River Valley development project should be utilized more effectively as a vehicle for interrelating outreach activities and extension education at the College.

Curriculum

1. The College of Agriculture curriculum should be reviewed to assure consistency between trends in Jamaican agriculture, the desired attributes of future professional agriculturalists, and a curriculum that will develop these attributes. The review should involve current and potential employers, as well as faculty and students, and should have as an aim the development of a shared sense of purpose. The review should examine curriculum concepts that would enable a curriculum to emerge which:

   a. develops core competencies such as problem solving, communicating and learning ability;

   b. enables students to become active participants in learning experiences aimed at developing the core competencies;

   c. develops students' ability to manage change by strengthening strategic planning and allocating skills as well as operating skills; and

   d. develop students' ability to discern and use appropriate problem-solving/situation-improving methodology and techniques while developing their agriculture knowledge base.

   The Curriculum Development Center should play a key role in facilitating the review process.

2. The Agriculture Schools at Knockalva and Elim should maintain the thrust of their curricula and look for ways to further enhance the integration of concepts with practice, such as enabling students to undertake mini-farming projects.

3. Urgent action should be taken by the Ministry of Education to equate and publicize the Agricultural Certificate with secondary school certificates such as the S.S.C., G.C.E., C.X.C. and U.L.C.I. The Agricultural Schools should not be required to certify their students through one of these external exams, as this is likely to divert the curriculum from its vocational emphasis and its integration of agricultural concepts and practice. The initiative taken toward this end by the MOE under the leadership of Reuben Gray is commendable and it is strongly recommended that the COA continue and support this effort.

4. The Curriculum Development Center should take the initiative in developing an ongoing publicity and promotion campaign aimed at informing the public of the existence and roles of the COA and Agricultural Schools. The campaign should build on initiatives already undertaken and utilize staff and students within the institutions as well as supportive external individuals and organizations.

5. A review should be made of the range of expertise available within the Technical Assistance Team from LSU with priority given to strengthening the management area with an organization development specialist.

6. With the confusion over the role of the Curriculum Development relative to the Technical Vocational Unit in the MOE now resolved, the C.D.C. should give a high priority to the development and distribution of learning

materials suitable for self-instruction and encourage the collection of this sort of material by the COA and Agricultural School libraries.

Administration and Management

1. To promote communication and assure that the TAT and other resources are utilized to the fullest extent possible, the COA with support and assistance of the TAT should develop an Annual Plan of Work that encompasses all aspects of the COA's development and related activities at and with Elim and Knockalva Agricultural Schools. The Work Plan should be updated annually at a workshop at which all parties to the JAEP are represented, including representatives of Elim and Knockalva Schools. To the extent possible, elements of the Work Plan should be prepared before the workshop. Within the year, parties to the JAEP should follow as closely as possible the schedules and levels of effort described in the Annual Work Plan. The Annual Work Plan should be widely distributed. The cost of the workshop should be paid by funds administered by the PIU.

2. A high-level representation to the Minister of Education, through the Board of Governors, should be made detailing the severe financial circumstances of the COA. The BOG should ascertain whether the Minister has been aware of the exigency, and assure that the Minister continues to be well informed in the future, with a view to increasing the COA budget to an adequate level. The representation to the Minister should emphasize that the COA and the agricultural schools are critical to agricultural production, income and development in Jamaica, and that continued financial stress at the COA impairs Jamaican economic development.

3. Faculty currently employed at COA and KAS who do not have a B.Sc. degree and who are required to spend 4 years at U.W.I. to acquire one should be enabled to attend institutions which will give them credit for their qualifications and experience and allow them to build on these. This should include U.S. institutions. Demonstrating this measure of confidence in the faculty is equitable and will strongly bolster the quality of these institutions, and support future upgrading of the institutions. The marginal return in morale and cohesion within COA and avoidance of disruption at KAS will greatly outweigh the marginal financial cost. Possible methods for funding this essential increment of participant training includes reallocation of USAID project funds, use of GOJ project funds and use of other scholarship programs outside the JAEP.

4. The Faculty of the COA should engage in farm management analysis of the Spring Garden Farm, with a view to assuring its strong and rapid development, and contribution to the COA's finances.

5. A public information campaign should be mounted for the COA and Knockalva and Elim Schools, aimed at promoting enrollments and increasing public awareness of the contribution of these important institutions to Jamaican economic development. (See Curriculum Recommendation 4.)

6. Consideration should be given to restoring US$3,000,000 capital investment funds that were earlier deleted from the loan agreement. Restoration should be conditional upon rapid progress of the present construction contracts, and upon the one-year extension of the project that has been recommended.

LESSONS LEARNED

1. In the conduct of agricultural education projects in LDC's, effort may be required in promoting an understanding among host governments that agricultural education may require more resources than education in other fields. Clearly in the Jamaican case, when the Ministry of Education took over agricultural education from the Ministry of Agriculture, it was unprepared to commit the level of financial support needed to adequately support and administer laboratories, farms, outreach and applied research programs, and other aspects of the college's curriculum.

2. Occasionally the short-term outputs of a project must be sacrificed in order to achieve long-term institution-building objectives. In the present case, the Jamaican institution has been left behind while the "project" forged ahead in producing many potentially useful outputs, that cannot be absorbed by the institution. A high level of excellent technical assistance appears to have temporarily overwhelmed the institution.

3. The sociological context within which a project is conducted must be understood and accommodated in order to successfully reach project goals. In the present case, apparently a long-standing tradition of patron-client relationships have been allowed to flourish and diminish the effectiveness of the project. The donor and contractor show a propensity to dominate decision-making and institutional functions, while the host institutions reciprocally defer to the donor and contractor for leadership. This does not build the local institution. This project and possibly others could be aided by a sociological analysis of relationships among parties to the project.

4. When starting new institutions, an effort to incorporate elements of its predecessors may be needed. In the present case, the COA replaces the old Jamaica School of Agriculture. While a new beginning seemed to be needed, the disenfranchised but influential JSA "old boys" will continue to be a problem for the COA. Efforts need to be made to provide continuity in alumni organization, certification of graduates, and other matters in order for the new institution to legitimize itself.

PURPOSE OF STUDY AND STUDY QUESTIONS

Between April 3 and April 21, 1988, a six person team assembled in Jamaica and conducted a mid-project evaluation of the Agricultural Education Project, Number 532-0082. The purpose of the evaluation was to determine to what extent initial project objectives had been and/or could be achieved, how well the cooperating agencies were performing their roles within the project, and in what manner project activities should continue (Statement of Work, OSU/AID work order). Specific questions that need to be discussed and answered are:

	Response on page:
1. Will the projected number of graduates from the COA meet Jamaica's need for agricultural scientists?	26
2. Is the Curriculum Development Center improving curricula at agricultural education institutions throughout Jamaica so as to meet manpower needs in agriculture?	
3. Are the COA's personnel structure and staff development plans appropriate for the next decade?	37
4. Are the cooperating institutions (AID, Project Office/MOE, Board of Governors, Project Implementation Unit, Financial Officers, Construction Monitors, Technical Assistance Contractor) effectively performing their roles in the project?	37-38 Summary
5. Has the Technical Assistance Contractor, (LSU, SHSU and SU) supplied appropriate personnel?	37
6. Are the current physical plant and building plans consistent with what is expected to be in place by the end of the project?	32
7. To what extent have the results expected from the project already been realized?	Summary and Throughout
8. What results can realistically be expected from the project by the time it ends on August 31, 1990?	32 Summary
9. Which assumptions contained in the logical framework are incorrect?	37
10. What changes should be made in the logical framework?	33 Summary & Recommendations
11. Should the Project be extended by one year?	Summary & Recommendations
12. Which components of the project should be continued?	Summary & Recommendations

To comprehensively and constructively answer the questions, the evaluation team members conducted their inquiry and provided the following findings and recommendations in the context of the project purpose: To establish a "fully viable and functional COA, with appropriate facilities, equipment, faculty and curriculum capable of meeting Jamaica's need for mid level agricultural professionals;" (Project Design Summary Logical Framework, June 6, 1984), and "the KAS has been expanded and improved with satisfactory facilities, faculty, equipment and curriculum to graduate a quality product, some of whom will matriculate to the COA," (Project Loan and Grant Agreement between the Government of Jamaica and the United States of America for the Agricultural Education Project, August 31, 1984). The team members believe the viability and functions of the COA cannot be considered independently of the agricultural schools Knockalva and Elim, as they are intimately tied to one another through their respective missions, curriculum, students, faculty, and various functions and objectives.

Therefore, in assessing the Jamaican Agricultural Education Project, the team has responded specifically to the questions suggested in its Scope of Work, and also identified and responded more broadly to issues in Jamaican Agricultural Education as they relate to the viability and functions of the College of Agriculture, Knockalva Agricultural School and Elim Agricultural School.

COMPOSITION OF THE EVAULATION TEAM AND EVALUATION METHODOLOGY

Team Composition

- Edwin Price - Member of Contract Team & Team Leader. Associate Dean and Director of International Research and Development, Oregon State University, U.S.A. (Agricultural Economist).
- Robert MacAdam - Member of Contract Team. Associate Dean, Hawkesbury College, Australia. (Agronomist).
- Suchet L. Louis - Member of Contract Team (Add-on, OSU/TU PSG). Associate Director, International Programs, Tuskegee University, Alabama, U.S.A.
- Lester Boyne - Ministry of Agriculture. Associate Director of Statistics and Planning, Kingston, Jamaica. (Agricultural Economist).
- Reuben Gray - Ministry of Education. Principal, Elim Secondary School for Agriculture, Elim, Jamaica.
- Leland Voth - USAID/Jamaica. Project Officer, Jamaica Agricultural Education Project.

Methodology

The evaluation methodology was described in The Statement of Work prepared by USAID/Jamaica and included the following:

1. Orientation Seminar

   After the contract team's arrival in Jamaica, an orientation seminar on evaluation objectives, methods and procedures was held. Key individuals involved in this project attended this initial seminar. The individuals who attended this meeting are listed in the Appendix. They represented the following parties: Ministry of Education, Ministry of Agriculture, Evaluation Monitoring Committee, College of Agriculture, Elim Agricultural School, ARDO/USAID/J, and the LSUAC TA Team.

2. Collection of Data

   To collect the necessary data for analysis and recommendations, the Evaluation Team has reviewed large number of project documents and files that were supplied by USAID, MOE, COA, KAS and EAS. The list of documents and files reviewed is given in the Appendix. The team also conducted interviews with key individuals at the institutions indicated above. The individuals who were interviewed are listed in the Appendix of this report.

3. Preparation of a Report

   The Evaluation Team prepared a draft of the report. It is a comprehensive report which follows AID reporting requirements as outlined in the Statement of Work. The preliminary report served as the basis for separate debriefings of USAID/J staff and the COA and LSUAC staff.

4. Debriefing

Prior to the Evaluation Team's departure from Jamaica, the team held two briefings of the interested parties (see 3 above). The purpose of these debriefings was to receive the feedback from these parties and to include necessary changes in the final draft of the report.

ECONOMIC, POLITICAL AND SOCIAL CONTEXT OF THE PROJECT

In 1985 agriculture accounted for 5.5% of GDP, 20% of the workforce, and 20% of Jamaican exports. Forty percent of Jamaica's population lives in rural areas. Partly due to deteriorating terms of trade, a drop-off in tourism, and declines in the world economy generally during the late 70's and early 1980's, the Jamaican economy suffered a decline in agricultural productivity, an overall decline in GDP, and increased inflation and unemployment. A stringent fiscal and monetary policy was instituted in 1985, resulting in sharp cutbacks in government expenditures. Personnel in the Ministry of Agriculture, for example, was reduced from 4,000 to 2,500 employees. The Ministry of Education was also forced to make sharp budget cutbacks over the period. These cuts came at the same time that the JAEP was initiating its activities, under a USAID/J-GOJ project agreement that implied increasing expenditures in agricultural education. The concurrence of project implementation and stringent government fiscal policies likely contribute to the severe shortfall in GOJ financial support for the JAEP.

Political factors associated with the formation of COA in 1981 have impacted the Agricultural Education Project. The Jamaican School of Agriculture was founded in 1910 and closed in 1981, after a distinguished history of contributions to Jamaican agriculture and national leadership. There is consensus that the JSA had to be closed in 1981 because of deteriorating academic programs and poor student, faculty and administration relations, and other factors. There is less consensus regarding subsequent events related to siting, staffing and naming the new College of Agriculture to take JSA's place. A difficult issue that directly affects present day Agricultural Education in Jamaica is the validation of certificates granted by the JSA. Graduates from the institution, during its final years, have had difficulty obtaining admission to more advanced educational institutions, and obtaining positions of professional responsibility at the levels for which they believe they are qualified by their JSA programs. The "old boys" of JSA are influential and their seeming de-certification rankles them.

In 1978 the administration of JSA was transferred from the Ministry of Agriculture to the Ministry of Education, and then in 1981 the JSA was closed. Certainly without design, the circumstances have impugned the MOE stewardship of agricultural education. Many suggest that criticism of the MOE's stewardship of agricultural education has tempered the MOE's enthusiasm for the institution, now reflected in MOE's meager financial support for the College of Agriculture.

The social context of present initiatives to improve Jamaican agricultural education have much to do with their prospective success. Agriculture in Jamaica is only slowly emerging from a long period since slavery during which farming was regarded as a low and demeaning occupation. To modernize agriculture and agricultural education is to struggle against societal values that accorded low status to agriculturalists. Fortunately, this is changing because of relatively attractive economic opportunities in agriculture today, particularly in the private sector, compared to government service, industry and other fields. Agricultural graduates find jobs more easily than graduates in many other fields. Nevertheless, vestiges of the old values still adversely affect progress in agriculture. Low levels of agricultural productivity in Jamaica today compared to similar agroclimatic regions, reflect a century of neglect in agricultural research, extension and education.

A second feature of social conditions that more directly affects the JAEP is the sociology of Jamaica/USA relationships. Jamaican professionals aspire to higher living standards which they often believe can be more rapidly achieved by migration to the U.S. than by staying in Jamaica, or returning to Jamaica after a U.S. education. Hence there is a risk that young faculty sent to the U.S. for training will not return. Another factor is the reciprocal proclivities of U.S. professionals and institutions to unduly dominate the affairs of Jamaican institutions, and of Jamaican professionals and institutions to let their U.S. counterparts do so. When, in order to promote institutional development, U.S. and Jamaican institutions wish to avoid or break such patron-client relationships, they must mutually avoid the tendency to "call the shots" on the one hand, and "let Uncle Sam do it," on the other.

The above economic, political and social conditions are those which informants often cited as having direct bearing on various aspects of the JAEP. In a number of cases, these conditions will be cited in the various findings, conclusions and recommendations in the following body of the report.

APPLIED RESEARCH

Findings

Prospective research programs of the College of Agriculture were discussed in a paper, "The College of Agriculture: Its Mission and Role of a Complementary Organ to the National Extension Service of the Ministry of Agriculture," (Wesley Nelson; c. July, 1987) suggesting that COA research and extension be conducted in close cooperation with the Ministry of Agriculture. Topics suggested for crops research included processing of pimento, turf grass culture, papaya propagation, varietal testing of corn and Irish and sweet potatoes, banana irrigation, cassava germ plasm collection, black pepper and vanilla production under high rainfall, and environmental parameters for domestic grape production. Nelson also proposed that small farmers' livestock practices be evaluated and that technology be developed for rabbit production. Other suggested research areas included plant protection and farming systems research.

Research in none of these areas is presently being conducted at the COA. A research project on goat production has been proposed for outside funding by Dr. Mellad (TAT) and Mr. Trevor Stoddart, Assistant Lecturer, COA, (December, 1987). Also research is being carried out by an LSU graduate student based upon a survey of farming practices in the Rio Grande River Project area. The leadership for these two research projects has been provided through technical assistance. No other research is apparent at the College of Agriculture.

By contrast, students and faculty are carrying out small applied research projects at both Elim and Knockalva, looking at such questions as the effect of length of darkness on poultry weight gains, nutritional factors in swine production, and other aspects of dairy, goat, and vegetable production. Record keeping for experiments was observed, and it was learned that students write reports of their work including supporting scientific references.

The COA Associate Dean for Research and Outreach states that lack of resources prevent the conduct of research and this view is strongly supported by faculty. One faculty member questioned how an agronomist can be expected to conduct soils research without chemicals, p^H meter, soil auger, or vehicle and gasoline for travel. He suggested that something might be accomplished when one or more of the essential items are available, but not when nothing is available. Yet soil testing work was being done among farmers in the COA outreach program by sending soil samples to MOA's labs. Also it was learned that the Jamaican Agricultural Development Foundation has substantial funds available for research grants, for which there have been few good proposals.

Opportunities may have been missed when soil mapping of the commercial farm was contracted to an agency of the Ministry of Agriculture. An alternative might have been to contract or financially support faculty of the COA to carry out the same work although it is recognized this might have taken longer. There are other pressing needs at Spring Garden in plant protection, irrigation research, farm accounting and other aspects of the commercial farm. COA faculty and students might attend to these needs through projects that simultaneously support teaching and research. If the COA lacks funds to conduct this needed work, funds for the capital development of the commercial farm might be utilized, similarly as the soils work was contracted, at least until the COA secures a more assured level of solvency.

One view within the evaluation team is that an A.Sc. degree granting institution is unlikely to offer sufficient professional incentive to faculty, or sufficient trained technical support from students, to enable the institution to carry out independent research of technological significance. Rather than formulate and conduct an independent research effort, the COA might rely partly upon the Ministry of Agriculture or other agencies for problem identification and research design. Research materials are often provided by such external collaborating agencies. For example, scientists at a number of international research institutes are eager to identify collaborating researchers who will manage one or more sites within international germ plasm nursery trials. Expectations for research at the COA may be set too high.

Presumably the Jamaican Ministry of Agriculture would willingly enter collaborative research efforts with the college; such collaboration would reduce the management burden of an academic administration that appears overwhelmed by managerial problems and issues. One faculty member reported going to the Ministry of Agriculture to initiate collaborative research efforts, only to learn that such efforts were governed by a COA/MOA memorandum of understanding, which neither he nor several of his faculty colleagues had ever been made aware.

A policy for Research and Outreach Program was proposed in October, 1987; widely discussed; revised in November, 1987; and is awaiting the final approval by the Dean. Provisions included in the policy first proposed and deleted from the latter, would have provided some independence to the Associate Dean for Research and Extension, and to researchers, in research financing. The proposed policy is complete in most respects. A Research Review Committee is proposed, which is charged with evaluating research proposals and the release of results, procurement of research funds, and other duties. These are sound proposals, however criteria for evaluating research proposals and release of results are not suggested. Potential impact on agricultural production, on productivity of problem agro-climatic regimes, or on disadvantaged human population, or other such criteria might be considered. There is no evidence, incidentally, that the goat project described previously has been reviewed in accordance with these provisions. Perhaps there is no need for it to be reviewed since the review policy has not yet been made official.

Conclusions

Essentially, applied research at the College of Agriculture has not begun. The capacity of the institution to independently formulate and manage an applied research program is questionable. Given the COA resources presently available to support crops research, only that research which would require few supplies or equipment is possible. Applied research associated with present livestock production may be more feasible. Significant opportunities for research funded externally to the COA operating budget exist, which include needed work at Spring Garden Farm, collaborative national and international research projects, and research funded by donors such as the Jamaican Agricultural Research Project of the Jamaica Agricultural Development Foundation (JADF), which is considering the goat project. Efforts of the Technical Assistance Team have not been aimed sufficiently at strengthening COA faculty leadership and initiative in research.

Recommendations

The Research Review Policy should be implemented as is, rather than wait for further revisions. A revision to include criteria for the review of proposals and release of results should be added later. A policy amendment that would support greater managerial independence and flexibility of the Associate Dean for Research and Development in financial resource acquisition and allocation is also encouraged. The Associate Dean for Research and Development, with the support and assistance of the TAT, should initiate collaborative research relationships with the Ministry of Agriculture, Commodity Boards, International Agricultural Research Institutes, and other agencies. The Associate Dean for Research and Development, with support and assistance of the TAT and the PIU, should plan research for the commercial farm at Spring Garden to meet requirements for the farm's development

Finally, there is no long term or short term applied research plan for the COA. At a minimum such a plan should include projected technical assistance in research areas one year in advance, and the level of effort of the TAT and COA. The TAT effort should be aimed at strengthening COA faculty leadership and initiative in research. The plan should be formulated and approved by all research participants, as a part of an annual Project Work Plan.

EXTENSION/OUTREACH

Findings

"Extension" and "Outreach" are considered interchangeable terms at the COA, but "Outreach" is preferred so as to distinguish the COA's program from that of the Ministry of Agriculture. Outreach programs at the College of Agriculture are regarded as one of its most active and successful programs. Principal activities include training programs for commodity organizations, and support given to 4-H Clubs, the planning of a Rio Grande Valley Development Project. Outreach can also be construed to include cooperative relationships in curriculum development, research and other activities, but for the purpose of the evaluation, attention was given only to those outreach activities that were associated with the dissemination of agricultural technology.

In addition to the ongoing work through personal contact, several Outreach policy and planning documents have been prepared. Nelson's paper on the COA's prospective extension programs emphasized relationships with the Ministry of Agriculture, and the COA's role in upgrading current extension staff, extension education at agricultural schools, as well as direct farmer extension efforts. The "Proposed COA Policy for Research and Outreach Program" emphasize farmer extension, through "lay leadership", "small groups", and "one-on-one" contacts. However, Verma's (TAT) recent memorandum which was prepared "to try to initiate an Outreach Program for the College" refers to none of the prior papers or present activities, and further suggests that outreach be placed under the PIU Coordinator and headquartered at Spring Garden, and have no relationship to the Associate Dean for Research and Extension (Verma, March 10, 1988).

Activities at the Rio Grande River Valley apparently focus on 4-H, but there is also a notion that this is a community development activity. The COA is in contact with a Dutch Government Community Development team (MOH) and the Spring Garden farm is selling bananna planting materials to the Dutch Project. COA students are working with the farmers in taking soil samples sending them to MOA, then interpret the results to the farmers. On a drop-in visit to the Rio Grande site, and through other discussions, it did not appear that the community development program had progressed very far. The COA's activities in the area needed to be coordinated through a plan of cooperation with the local community, MOA extension agents in the area and community leaders.

The COA had recently given a short course on extension methods to staff of the Cocoa Board. None of the faculty who presented the training had any experience in Jamaican agriculture. One presenter was a new member of the COA faculty in Extension Education from abroad, and the other was a TAT member. The Associate Dean for academic affairs also explained that the new faculty member in extension education is expected only to teach, and not to participate in field extension activities, such as the Rio Grande River Valley Project. This is despite the fact that one problem with the Rio Grande Project is said to be that no COA faculty are involved.

Conclusions

Outreach planning and activities are fragmented, however, some of the parts such as 4-H academic teaching of extension methods, and short-course teaching

of extension methods appear quite healthy. Extension teaching appears unrelated to practice in a programmatic manner. A clear rationale and conceptual framework within which parties to extension education and field extension can relate to one another has not been agreed upon. The Rio Grande Valley presents an opportunity to conduct an integrated agricultural development effort in which faculty and students with various interests and expertise might relate one to another in a problem-solving effort. Focussing initial efforts on 4-H and banana production in which there appears to be starts and then branching into other areas in a farming systems context, could be the kind of program that would bring all the parts together. The Rio Grande development project could then be used for short-term training of MOA extension workers as well as comprise a vital part of the COA's outreach program.

Recommendations

The position of Extension Coordinator for which the College is now recruiting, should be filled promptly. With support and supervision of the Associate Dean for Research and Development, and Support and Assistance of the TAT, the incumbent should formulate a long term plan of work. A one-year plan of work should be developed and annually revised, which reflects all extension activities. This Annual Work Plan should identify schedules of TAT contributions and their expected contributions in relation to initiatives of the College of Agriculture. A Rio Grande River Valley development project appears to be an important potential vehicle for interrelating outreach activities and extension education at the College.

CURRICULUM

In evaluating the curricula of the College of Agriculture and the Agricultural Schools, it was assumed that the purpose of the institutions was to educate the people who would take the lead in managing Jamaican agriculture in the future, at the farm level and as professionals and para-professionals in the institutions that make up the agricultural sector. Based on this assumption a number of general criteria were set for assessing the curricula. The dynamic and complex nature of modern agriculture requires managers who are able to take a holistic approach to problem-solving and situation-improving and who appreciate the interaction of physical, economic and psycho-sociological phenomena. They must be good communicators and they must have learned how to learn because they will be operating in a constantly changing environment.

Assumption 1: An effective curriculum will develop students as problem-solvers, communicators and learners in both farm and off-farm agricultural contexts.

The process of managing can be seen as three interlinked levels of activity as represented in Figure 1.

Assumption 2: An effective curriculum will develop students as strategic planners, allocators and operators.

An effective educational institution will provide learning experiences that enable the curriculum objectives to be achieved. In this case, the curriculum objective is to develop students as problem solvers, communicators and learners who are able to utilize this competence in strategic planning, allocating and operating, all in an agricultural context. This means devising situations where students are able to experience and act on the need to relate concept to practice and in doing so, develop an ability to discern and integrate processes and content.

Assumption 3: An effective curriculum will provide a sequence of learning experiences for students that enable them to integrate concept and practice and is just as concerned with developing the student's ability to use knowledge (methodology) as it is with developing a knowledge base (content).

These assumptions provided a framework of criteria for evaluating the curricula at each of the institutions visited.

Findings

College of Agriculture, Port Antonio

A quantitative analysis of the most recent draft of the curriculum for the Associate Science Degree in Agriculture (March 16, 1988) is included in Tables 1 and 2.

Figure 1. A SYSTEMS CONCEPT OF MANAGING AN ORGANIZATION

ORGANISATIONAL LEVEL	MANAGEMENT TASK	OPENNESS TO EXTERNAL INFLUENCES	TIME PERSPECTIVE	DESIRED OUTCOME	GENERAL PROCESSES	DECISION-MAKING TECHNIQUES	FARM EXAMPLE
STRATEGIC	Relating the Resources and Activities of the Farm and the Needs of the Owner to External Changes and Deciding How to Respond.	OPEN	LONG RUN	SATISF-ACTORY	NON PROGRAM-MABLE	JUDGE-MENTAL	Study of local & overseas factors suggests demand for beef will outstrip supply and prices will rise. Local market depressed. Property not running many cattle but has capacity to do so with investment in fencing & water supply. Decision to invest in cattle & necessary farm development while breeding stock are cheap.
ALLOCATING	Allocating Resources and Integrating the Internal Activities of the Farm to Achieve Goals.						Deciding how to allocate resources between enterprises. Matching cash flow to demands for cash; employing labour.
OPERATING	Achieving Objectives effectively and efficiently.	CLOSED	SHORT RUN	OPTIMAL	PROGRAM-MABLE	COMPUTAT-IONAL	Milking cows; growing a crop Controlling internal parasites in stock; fertilising pasture; building a farm dam or new set of yards.

Table 1. Quantitative Analysis of College of Agriculture Draft (March 16, 1988) Curriculum for the Associate Science Degree in Agriculture

A. Committed Hours per Week of Formal Coursework Classified in Terms of Content and Process for each Course Semester (excluding the Internship)

	LECTURES			LAB CLASSES			ELECTIVES	FIELDWORK		TOTAL
	Basic* Science	Applied & Agric. Science	Social Science***	Basic Science	Applied/ Agric. Science	Social Science		Field Practice	Projects	Hours Perk Week
Semester I	15	-	5	7	-	-		15	-	42
II	11	-	3	8	-	-		9	-	31
III	2	11	2	2	6	-		9	-	32
IV	-	13	3	-	4	-		9	-	29
V	-	10	6	-	4	2	6(Est.)	-	9	37
VI	-	-	6	-	-	-	12(Est.)	-	9	27
Proportion of Total hours	28	34	25	17	14	2	18+	42	18	198
% of Total Hours	14.14%	17.17%	12.63%	8.58%	7.07%	1.01%	9.09%	21.21%	9.10%	100%

\+ The 18 hours devoted to electives are estimated to comprise 13 hours of lectures and 5 hours of lab classes on average.

* Basic Science = Botany, Chemistry, Maths, Zoology, Physiology of Plants and Animals

** Applied and Agric. Science = Computer Science, Beef and Dairy Science, Vegetables, Soil Science, Farm Power & Machinery, Animal Nutrition, Swine & Poultry Science, Field and Forage Crops, Ornamental Horticulture, Research Methodology, Vet Science, Plant Protection

*** Social Sciences = Intro to Agric., English, Communication, Agric. Ecos., Farm Management, Rural Sociology, Extension, Agric. Educ.

Table 2. Percentages of Total Committed Hours of Formal Coursework Classified in Terms of Content and Process

Process	%	Content	%
Lectures	50.5	Basic Science	22.7
Lab Classes	19.2	Applied & Agri. Science	24.3
Field Prac.	21.2	Social Science	13.6
Field Projects	9.1	Electives	9.1
		Field Prac.	21.2
		Field Projects	9.1
	100.0		100.0

Some observations on these data are:

1. A high proportion of the students' time is committed to scheduled activity ranging from 42 hours per week in semester I to 27 hours in semester VI.

2. Lectures and lab classes are the dominant teaching/learning mode with 69.7% of scheduled activity devoted to it.

3. Physical and biological sciences dominate the curriculum with 47% of scheduled activity devoted to lectures and lab classes, compared with 13.6% for social sciences (including the elective subjects).

4. If lectures, lab classes and supervised field practice is seen as reflecting the teacher as the dominant person in the teacher-student relationship, and project activity the student, then the teacher clearly predominates. Ninety-one percent of scheduled activity is devoted to the former and only 9% to the latter. There is little scope for students taking the initiative in designing, implementing and evaluating learning experiences.

5. The curriculum is reductionist rather than holistic in its approach to agriculture. For semester I 22 hours of lectures and lab classes are devoted to basic sciences. The underlying assumption is that students will learn about agriculture by studying the sciences that relate to it and the strategy is a building-block one, moving from basic to applied science. The curriculum begins with the parts that go to make the whole rather than the whole itself.

6. The emphasis in the curriculum is on building the students' knowledge base with only minor attention to learning/problem solving/research methodology and techniques. There is a 2-hour/week lecture course on research methodology in semester V.

7. Coursework that is directly concerned with developing the students as communicators comprises Use of English (3 hours of lectures/weekly in semester 1), Communication Skills (3 hours of lectures/week in semester II), and Oral Communications (2 hours of lectures/week in semester IV). The emphasis is on lectures.

8. Course work concerned with the process of managing comprises fundamentals of Agricultural Economics (3 hours/week in semester IV), Farm Business Management (3 hours of lectures and 2 hours of lab classes/week in semester V) and Agribusiness Analysis and Management (3 hours of lectures in semester VI).

An important feature of the curriculum is the Cooperative Internship program at the end of year 2 whereby the student is required to undertake satisfactorily a period of work experience with an agricultural service institution (e.g. Ministry of Agriculture) farm or agro-indsutry. This is an 18-week period of supervised field experience followed by a 2-week reporting period back at the College.

Given the three assumptions underlying the analysis, the curriculum did not meet expectations. It is inadequate for developing agriculturalists who can lead in managing the development of Jamaican agriculture. Grounds for this conclusion are that the curriculum:

1. presented agriculture in a reductionist or atomistic rather than a holistic or systemic one;

2. was teacher-centered and treated students as passive recipients of knowledge rather than active participants in learning experiences designed to develop their competence as problem-solvers, communicators and autonomous learners;

3. paid minimal attention to developing students as allocators and none to strategic-planning; and

4. was almost exclusively content oriented, with only minor attention to developing students ability to use learning/problem-solving/research methodologies and techniques.

Discussions with faculty members, students, LSUAC team members and other interested parties provided insights into why the situation was the way it was and how it might be improved. Specifically, the College lacks a common sense of purpose or mission and the quality of interpersonal relationships within the institution is low. Curriculum development in this context resembles a process of collective bargaining over the proportion of the curriculum to be taught. There was little evidence of a shared approach to developing an appreciation of the needs of Jamaican agriculture and devising and implementing a curriculum that meets the perceived needs.

In the absence of a clear sense of curriculum purpose and strategy the curriculum is open to pressure to accommodate widely differing demands. There is pressure to upgrade the level of science taught so that graduates have the credentials to undertake higher education. Faculty members are pressing to include more of their special areas taught. Community groups want their specific needs reflected in the curriculum e.g. merchants want salesmanship taught and disaster relief organizations want disaster emergency procedures. The staff and curriculum planners at the College are aware of these pressures and concerned about them but the poor pattern of communication and the absence of an alternative curriculum concept are major constraints to an appropriate response.

The offering of electives in year 3 is seen by some faculty members as a partial response to the need for diversity in the program and students expressed their appreciation of the electives component of the curriculum.

The Cooperative Internship program is highly regarded by students and staff. They cite examples of students being employed by their hosts following graduation. The program offers an excellent opportunity for integrating

concept and practice in a real-world agricultural setting. It also offers opportunities for students to undertake problem-solving projects where methodology and content are integrated and addressed to real agricultural situations.

The field practice component of the curriculum is ineffective. It is starved of resources and is not integrated with the classroom activity. Students emphasized this area as the major deficiency of the program and this was confirmed by the staff. Students spend three hours per day in what is regarded as largely wasted time. It was generally agreed that graduates of Knockalva and Elim schools had a better grasp of applied agriculture when they arrived than most graduates of non-agricultural schools had when they left the College.

Students complained about instability in the curriculum with frequent changes in course offerings and in the way the same courses were presented. Also, rigidity in the class schedule was cited by staff and students as a reason for not undertaking learning projects off campus.

Knockalva Agriculture School

At Knockalva there is a climate of cohesion and interaction between faculty and between faculty and students that is lacking at the College of Agriculture. Morale is good and there is a common sense of mission toward which all appear to be striving. This has enabled a curriculum which is consistent with the mission to emerge. Knockalva and Elim have not suffered the severe scarcity of resources visited on the College of Agriculture and this is undoubtedly a major contributing factor to the perceived differences in organizational climate and curriculum offering. There is also at Knockalva a sense of autonomy that is missing at the COA where the need to accommodate the needs of the faculty and students, the L.S.U.A.C. team, the Project Implementation Unit, USAID and the Ministry of Education have contributed to the instability perceived there, as has the rapid staff turnover. The staffing at KAS has been relatively stable and this has contributed to the sense of cohesion.

The staff at Knockalva see their prime mission as the education of future farmers and farm managers. They concede, however, that there seems to be more concern about students who are faring poorly academically than those who are lagging in the applied aspects of the course and admit that this reflects some ambiguity. The fact that the school is a feeder institution for the College of Agriculture and the majority of students we interviewed intend to go on to the College is a contributing factor, as is the concern about the recognition in the community of the School's Agricultural Certificate, which is discussed in more detail elsewhere in the report.

The staff are proud of the integration of classroom activity and field practice they have achieved and it is clear that constant attention is paid to the need to relate concept to practice. First year students do 10 hours of farm practice per week (5:30-7:30 am) and second and third year students 20 hours (5:30 to 7:30 am and 3:30 to 5:30 am). Students are rostered to work on the farms on weekends and in the case of the livestock farms (dairy, piggery and poultry) they provide all the farm labour.

The livestock farm practice is regarded as having reached a higher state of development than the cropping one. The students maintain and monitor records

of inputs and outputs and relate them to budgets and get hands-on experience in occasional practices (castrating, slaughtering, dehorning) as well as routine ones (feeding, cleaning, milking). The staff who teach animal science in the classroom are also responsible for the farm practice.

The crop farm practice was not as advanced as the livestock and although students undertook as group projects the growing of vegetable crops this was on a small scale and farm staff did most of the work on the commercial farm. There was also a perceived need on the part of staff to more closely integrate agricultural engineering/mechanization with cropping farm activity. The staff strive to expose students to commercial farming activity and small groups of students make about five visits per semester to local farms.

A deficiency in the syllabus perceived by staff is the limited input on agribusiness (allocating and strategic-planning). There is only a part-time teacher and the class schedule (Appendix 1) included only one hour per week for each class year on agribusiness.

The staff were positive about the desirability of enabling students to actually manage mini-farms, including making decisions about enterprises and their production and marketing. They saw this as the best way to enable students to experience the reality and complexity of agriculture, particularly if they could share any profits. They believed this was the next step in the evolution of the field practice aspect of the curriculum.

Elim Agriculture School

The situation at Elim was similar to that at Knockalva, with the same sense of purpose, commitment and camaraderie. The curriculum and the way it was managed was also very similar.

There is at Elim a full-time Lecturer in Agribusiness, a recent graduate of the College of Agriculture, and he is providing leadership in the development of the management aspects of the curriculum. All the assignments he sets are based on the school farms and prices of produce sold at the farm shop are used by students to link market signals back to farm production.

There was a project at Elim in which students selected, grew and marketed a crop with profits being shared by the student group who grew the crop. The project was very popular with students but was dropped a few years ago while the school was going through a period of management instability. It is, however, feasible to run such a project and there are plans at Elim to re-introduce it.

Entry Requirements

The situation regarding the entry standards and requirements for the College and agricultural Schools is a confusing one. A contributing factor is the variety of school categories attended by applicants and the range of completion certification awarded. An explanation of both is as follows.

New Secondary Schools were created in 1976. They were previously Grade 9 Schools and were upgraded to Grade 11. They award the Secondary Schools Certificate (S.S.C.) on completion and this is a Jamaican certification. The New Secondary Schools operate alongside traditional high schools which offer the General Certificate of Education (G.C.E.) on completion. Students take

"O" Level exams (Ordinary) at the end of Grade 11 and can go on and take "A" (Advanced) levels at the end of Grade 13.

The S.S.C. and G.C.E. are seen as equivalent, but students who undertake the S.S.C. are frequently those who did not succeed in the entrance exam for G.C.E. schools. The entrance exam for those schools is at the end of Grade 6 and 10,000 candidates are successful. The 30,000 who did not take exams, or who did not succeed, go into the New Secondary Schools and eventually take the S.S.C. exam.

A third set of schools are All Age Schools, which go up to Grade 9. Students at these take an exam in Grade 9 which creams off students into Technical High Schools for a 4-year program (Grades 8-11) where they repeat some of the work done at the All Age School. The Technical High Schools offer two different awards, the U.L.C.I. (Union of Lancashire and Cheshire Institute) and L.G.C.E. (London General Certificate of Education). Both are international certifications and the L.G.C.E. is a variation of the G.C.E. for more technically oriented programs, It awards both "O" and "A" levels of certification.

There is also a Caribbean qualification, the C.X.C, which is being offered as an equivalent to the U.L.C.I. and G.C.E. Hence, there are four forms of secondary school completion certification, the S.S.C., G.C.E./L.G.C.E., U.L.C.I. and C.X.C.

To gain entry to Elim or Knockalva an applicant must be between the age of 15-17. They provide their school academic record and personal references. Selected applicants are then invited to take an entrance exam in the areas of English, Maths, General Knowledge and Intelligence. Successful candidates are invited for an interview and final entry is based on all this data. Some students entering Elim will have awards such as the S.S.C., C.X.C. and G.C.E. and others will not.

To gain entry to the College of Agriculture an applicant must have passed four subjects, including English, Maths and a Natural Science subject in any combination of the C.X.C. (General Proficiency, Grades I and II or Basic Proficiency, Grade I), S.S.C. (Range V). The Agricultural Certificate from Elim or Knockalva (Grades I and II) are also acceptable and there is also an entrance examination set by the College for apparently suitable applicants who did not meet any of these criteria. Applicants who meet the set criteria are then interviewed and a final selection made.

Status of the Agricultural Certificate

Probably the major constraint against increasing the numbers of suitable applicants into Elim and Knockalva has been the failure of the Ministry of Education to categorize the status of the Agricultural Certificate relative to other Secondary School certificates (S.S.C., G.C.E., C.X.C., U.L.C.I.). The Agricultural Certificate and what it represents is not recognized by either employers or tertiary institutions (with the exception of the College of Agriculture). There are widely differing perceptions and prejudices about the level of award with one prominent agribusiness leader we interviewed speaking very highly of Elim graduates based on his personal experience and an equally highly ranked civil servant being derogatory and referring to the Schools as Practical Training Institutes (which were part of their genesis) which took students who were unable to go further at school and trained them in manual farming skills.

The example was presented of an Elim graduate who applied for entry to Teachers College and was admitted on the grounds that he had the S.S.C. before going to Elim, the Agricultural Certificate being ignored. We heard of distressing situations for both graduates and staff of otherwise suitable applicants for jobs being turned away because employers did not understand the Agricultural Certificate.

The Agricultural School administrators are placed in a dilemma as a result of this lack of recognition. They could alter the curriculum to enable students to take C.X.C. exams but are rightly concerned that this would divert the Schools from the mission they do well, providing integrated vocational education for future agriculturalists. The Agricultural Certificate recognizes more than academic ability and represents general competence. As such, it is of potentially more value as a guide to a student's abilities than the conventional forms of certification and it would be a retrograde step to revert to them.

The Agricultural Schools believe their Grade I and II Agricultural Certificates should give their possessors access to tertiary institutions such as Teachers' Colleges and the College of Agriculture, and to employment in the civil service. The Grade III award would indicate that the possessor had satisfactorily completed the Agricultural Certificate course but not to a level that indicated ability to successfully complete tertiary studies.

The distressing nature of this situation has been compounded by the failure of the College of Agriculture to assess the 1987 Agricultural Certificate exam papers. This means graduates of the Agricultural Schools are seeking entry to employment or tertiary education not only without a recognized award, but without any award at all.

Demand for Graduates

Estimated manpower needs for professional agricultural personnel cited had as their source the Jamaica Education Sector Survey, Ministry of Education, Kingston and were published in 1977. They estimated an annual demand for 256 new graduates per year of whom 196 would become farmers with the remainder going mainly into government service or teaching. Holcomb's (1978) report included estimates made by the University of Agriculture in 1978 that projected an increase in demand from 170 in 1978 to 850 in 1983, with extension staff recruitments rising from 90 to 450, teachers from 35 to 175 and agribusiness from 10 to 50. Whereas the Ministry of Education survey estimated 196 graduates, the Agriculture Ministry estimated only 30 for 1983. There was obviously a wide variation in estimates of demand at the time and this continues to be the case.

The University of Kentucky team, in their 1979 report, found that 116 students graduated from JSA in 1978 and that this was a sharp drop from the two previous years (145 in 1976 and 147 in 1977) and an increase of only 29 percent over the annual output of JSA agriculturalists in December 1974. Given this previous shortfall, and the current and projected emphasis on agricultural development, the Project goal of 100 associate degree students from COA per annum appears realistic.

The only recent quantitative information comes from a College of Agriculture graduate follow-up study for 1985-7, the results of which are in appendix 2. This showed that all graduates were employed with at least 95% of them in

agriculture. Teaching agriculture accounted for 25.3%, extension 10.5% and about 23% in agriculture production, mainly of crops.

Many informants expect an accelerating demand for graduates working in enterprises aimed at the export market, particularly in horticulture and aquaculture. They saw the graduate as needing a commercial management orientation. Many also spoke of Jamaica's aging farmer population and the need to replace them with graduates trained for modern agriculture. They recognized, however, that access to land and capital were also needed if graduates were to become farmers.

Student Enrollment

Figure 3 gives details of student registration at the College of Agriculture for the 1985-7 period. Whereas 79 were admitted in 1987 only 60+ will be admitted in 1988. Project plans projected an intake of 110 but such is precluded because of lack of residential space. Staff at the COA believe that too many low caliber students were admitted in the past and the entrance interview process is now used to try to weed out those who have no interest in agriculture but who were able to gain entry to other institutions. (There is, however, a low failure or dropout rate from the program. Lack of academic development is a more import cause of dropouts, rather than deficient ability). The Registrar reported a higher caliber of applicant for the next school year.

Ignorance about the College and an antipathy among the old boy network of JSA toward the new college, together with a more generalized social perception of agriculture as a low status occupation are seen as militating against increasing enrolments. There has been virtually no attempt to promote or advertise at the College, however, with lack of funds for travel cited as the main reason. The Registrar said that the best students came from Elim and Knockalva and those with urban backgrounds tended to have less academic ability. The Elim and Knockalva students were at a disadvantage in the earlier stages of the program because their science background was not as strong.

Table 3: College of Agriculture 1985-1987

	MALE	FEMALE	TOTAL	FOREIGN STUDENTS
SEPT. '85	23	7	30	1
JAN. '86	22	6	28	1
SEPT. '86	45	23	68	1
SEPT. '87	64	15	79	1
TOTAL	154	51	205	4

Knockalva has a capacity for 175 with a current enrolment of 168, of whom 118 are male and 50 female. The plan is to increase the capacity to 238, 152 male and 86 female. The staff perceive a significant number of students for whom the school was not a first choice and they would like to see the quality of the intake upgraded. They mounted a recruitment drive in March 1988 by visiting seven schools within a 30 mile radius and presenting a slide show, talk and discussion. They found that there was almost complete ignorance about the school and said they excited a lot of interest in it. Elim has an enrolment of 231, 138 males, and a capacity for 300.

A major problem militating against increased enrolment is the fact that the Agricultural Certificate has not yet been categorized by the Ministry of Education. At Elim we learned that 40-50% of the 1987 class are unemployed and the fact that the 1987 final exam papers had not been graded and they had not been awarded a Certificate was a major factor. The agricultural education sector cannot afford to alienate clients in this way.

COA Accreditation

The College of Agriculture is seeking acccreditation by the Southern Association of Colleges and Schools of the United States. Initial steps have been taken and leadership provided by the LSUAC/TA team. The TA Team efforts in this regard can be summarized as follows. In 1986, Dr. L. L. Pesson, Vice-Chancellor for Student Affairs at LSU initiated the process by contacting Charles R. Nash, Associate Executive Director, Commission on Colleges, Southern Association of Colleges and Schools, Atlanta Georgia. It was advised that Dean Nelson should submit a letter to Dr. James Rogers, Executive Director of the Commission on Colleges, indicating COA's intent to seek accreditation by Southern Associates.

Dr. Nelson's letter would have started the process of accreditation, once the application process was followed. In 1987, Dr. L. L. Pesson wrote to Dean Nelson indicating the procedure to follow in applying for accreditation. Dr. Pesson proposed a site visit to COA for May-June 1987. Accordingly, Drs. Pesson and Firnberg held a seminar on institutional accreditation process for COA administrative staff and senior faculty. It appears that the TA team provided COA with relevant information to start the process of a self study.

One of the conditions for accreditation is a qualified academic faculty. At present, the participant training is lagging behind schedule, therefore, it is difficult to predict when COA will meet this accreditation requirement. Until the participant trainees start to return with advanced degrees and remain at the College to be effective and productive faculty, the COA accreditations will not be easy to obtain despite progress that can be expected from the Curriculum Development Center and the input of the TA team to the curriculum.

Pesson and Firnberg's recommendation for COA to appoint an individual who will lead the efforts toward accredition should be pursued. In the meantime, COA could seek a memorandum of understanding (MOU) with some U.S. Title XII universities for faculty and student exchange programs and for joint research development. U.S. Universities and Colleges with limited resources but excellent teaching and research and extension programs should be encouraged to visit COA and seek institutional linkage

Curriculum Development Center

The Curriculum Development Center (C.D.C.) is not as yet an operationally effective entity, particularly as it relates to its influence at KAS, Elim and other schools which teach agriculture.

It has been difficult to reconcile the role originally envisaged for the C.D.C. with institutional realities. The Technical Vocational Unit (T.V.U.) in the MOE has a responsibility for curriculum development in schools but they knew nothing of the C.D.C. and its role. Only now is a Memorandum of Understanding being developed between the C.D.C. and T.V.U. and it is hoped a proposal can be forwarded to the Permanent Secretary in April 1988 for his approval.

The C.D.C.'s work with KAS and Elim to date has been limited to a workshop the C.D.C. sponsored and facilitated in 1986 at the COA and attended by COA, KAS and Elim Staff. The workshop was aimed at developing a common curriculum for the schools and a rationalization of their curricula and that of COA. The workshop was of one week duration and staff from all discipline areas at each of the institutions was represented. The workshop was seen by staff at KAS and Elim as a valuable one and it had a positive effect on the curricula.

It was agreed at the workshop that there should be subsequent weekend meetings in December 1986, March and August 1987 as part of a continuing process of consensus building and curriculum development. Financial constraints have prevented this. The teachers from KAS and Elim expected to be paid for the work but the MOE was only prepared to meet travel costs. It was apparently not possible to work out an arrangement to use project funds.

The staff at Elim and KAS believe the C.D.C. can play a useful role as a coordinating and resource center but the general perception of the COA at those schools is a jaundiced one at present and this will create problems for the C.D.C.

The C.D.C. can play a role at COA and its members are active in the decision-making process on curriculum. In the context of the low-quality pattern of communication at COA however, there is a feeling among some staff that the C.D.C. is usurping the role of the Academic Affairs Committee. This Committee is only now beginning to meet and function and it may well be that the C.D.C. has been inadvertently filling a vacuum in the decision-making structure of COA.

Personnel Structure and Personnel Development

The organizational structure of the COA and the schools is regarded as satisfactory and the organizational constraints are related more to lack of common purpose, procedures and organizational climate at COA. An example of the latter is the fact that Assistant Lecturers at COA have missed out on salary increases they would have received had they been school teachers because of anomalies in the classification of staff. This is being addressed, albeit slowly, but it rankles with the affected staff.

An important issue which is within the scope of the project to resolve is the one of further training for staff at COA and KAS. Unless staff have a B.Sc. degree they are not eligible for post graduate study. At KAS none of the staff is eligible and at COA only one of the four Assistant Lecturers we met

are eligible. There is, however, a further complication and that is unless the candidate has an Associate Degree in Agriculture, the U.W.I. insists that he or she completes four years of undergraduate study for the award of a B.Sc. A candidate who has the Associate Degree has to do two years at U.W.I. The U.W.I. appears to be inflexible in its refusal to recognize the Diploma from J.S.A. and the relevance of the candidate's experience. USAID policy is not to support undergraduate study in the U.S. from its portion of project funds but is prepared to agree to the GOJ funding this out of its portion.

This situation is a contributing factor to the lack of cohesion at COA and may well have a similar affect at KAS in the future. A factor that influenced junior staff at COA to join the faculty was the promise of higher education and a subsequent career at COA. These staff struck us as committed to the future of COA and as capable people, although somewhat disgruntled with the present situation at COA. At KAS the staff had put in years of dedicated service (up to 11 years), were obviously competent, had developed an effective institution and were committed to its further development.

It appears that unless the nexus is broken these people are going to have to spend four years at U.W.I. in a program that does little to build on their present learning and future aspirations, or miss out completely and watch graduates from COA with an Associate Degree come into the institutions and leap-frog them in their career development. Either way it is a destabilizing factor in a situation that badly needs stability and recognition of effort.

We believe an option that should be reconsidered is that of allowing staff of COA and KAS to undertake undergraduate study in the U.S. It would not take as long as the U.W.I. option (say 2 years compared to 4), would accept the candidate's experience as relevant and would enable the student to concentrate study in their areas of interest and expertise. Probably most importantly in the overall context of the Project it would make a constructive contribution to the organizational climate.

We believe that the profile of staff expertise at COA and at KAS needs strengthening in the management area. There is currently one retired Senior Lecturer in Agricultural Economics and Farm Management at COA and a part-time Lecturer in Agribusiness at KAS. This constitutes a serious weakness in the profile of the institutions and calls for recruitment of staff with appropriate expertise and/or retraining of current staff as part of the training program.

Assuming that the quality and relevance of COA's curriculum improves, the institutions are promoted, and their certifications clarified and rationalized it appears that the projected numbers of graduates are appropriate. The rapidly developing export oriented component of the agricultural sector is seen as a major employer of suitably trained graduates.

The Curriculum Development (C.D.C.) has not yet emerged as an operational unit largely because of the energy that has had to be invested in achieving agreement with the Technical Vocational Unit of the MOE on their respective roles as far as development of agricultural curricula in schools is concerned. The C.D.C. is still regarded as a worthwhile concept at COA and at KAS and Elim and a one week workshop held by the C.D.C. at COA in 1986 and attended by staff from all three institutions received favorable comment.

Conclusion

The COA curriculum is presently not adequate for educating the professional agriculturalist who are to take the lead in managing the future development of Jamaican agriculture. Key contributing factors are the lack of a shared sense of mission at COA and the weak working relationships among faculty. Absence of a concept of curriculum that would enable a program that meets the need to produce future-oriented agricultural managers to emerge is also an important constraint, as is also a serious and debilitating lack of resources.

At KAS and Elim there is a clear sense of shared purpose and a cohesive striving to achieve it. An appropriate curriculum has emerged and is being constantly improved. In contrast with COA there is an effective integration of concept and practice.

A major constraint acting on all three institutions in attracting adequate numbers of quality students is the general ignorance in the community about their existence, purpose and operations. This is exacerbated in the case of KAS and Elim by the failure of the MOE to classify the Agricultural Certificate relative to other secondary education awards. This places graduates at a serious disadvantage in seeking employment or higher education.

A bottle-neck in the training program that is contributing to the instability at COA and with potential to do the same at KAS is that of access to further training of staff who do not have a B.Sc. or an Associate Degree. These are the majority of the KAS staff and of junior staff at COA. The simplest way to break the nexus, and most effective in contributing to the aim of the Project, would be for USAID to agree to fund undergraduate training in the US from its portion of the funds. A gap in the profile of staff expertise, particularly at COA and KAS, is in the management area and this needs to be filled either by recruitment or further training.

A major constraint at all three institutions is the shortage of learning materials accessible by students and staff.

CONSTRUCTION, PHYSICAL PLANT MANAGEMENT, AND COMMERCIAL FARM

Construction

Are the current physical plant and building plans consistent with what is expected to be completed by the end of the Project (31st August, 1990)?

Due to a 3-million dollar reduction in the funds that were allocated to the project, the number of physical facilities originally planned in the Loan & Grant Agreement will have to be reduced by the end of the project.

1. At the College of Agriculture (COA), a great house has been renovated as guest quarters and a new water storage tank constructed. At the Knockalva Agricultural School (KAS), no construction has started to date. However, KAS construction was originally planned as the last to start. It is now about 17 months behind but could be completed within the original time frame of September 1989. This represents little progress in the construction plans and a major hindrance to meeting project objectives.

2. By August 31, 1990 it is expected that all the remaining facilities will be built as modified in accordance with the cut in the allocation of funds. (See below # c). At present, building contracts are being negotiated. It is expected that two separate contracts for COA and KAS will be signed by July, 1988.

3. The following changes should be made in the logical framework.

   a. At the College of Agriculture

. Classrooms:	two new classrooms instead of three.
. Dormitories:	two dormitories instead of three.
. Faculty Housing:	in the original plan 18 homes were to be built. This has been shifted to four 3-bedroom duplexes and six 2-bedroom apartments that can accommodate single staff members or families.
. Poultry Houses:	the two new poultry houses will not be built.
. Piggery:	the new piggery will not be built.
. Dairy:	The new dairy will not be built.
. Abattoir:	the expansion of the abattoir and the building of a new refrigeration facility will not take place.
. Feedmill:	the completion of the feed mill will not occur.
. Hatchery:	the hatchery will not be completed under the project (having been completed using college resources).
. Animal Science laboratory & central storage	the engineering building will not be converted into an animal lab and a central storage facility.

. Staff Housing:	the duplex will <u>not</u> be built but instead, one 3-bedroom farm manager's house will be constructed.
. Administration building::	<u>no</u> new partial second level will be built. But instead, a new addition to the actual administration building and an improvement to the existing building will take place.
. Laundry:	<u>no</u> new laundry will be constructed.
. Guestquarters:	a great house will be converted into guest quarters (almost completed).
. Plant Propagation and a classroom:	The new plant propagation lab and classroom with the curriculum Development Center's office and space will be built but the terracing will <u>not</u> take place..
Engineering workshop & a 1800 foot access road:	these constructions will not take place under the Project's Loan funds but a limited engineering facility will be built by the PIU/COA and utilize some former JSA building materials.

b. <u>At Knockalva Agricultural School</u>

. Classrooms:	one new building with 3 instead of 6 classrooms and 3 laboratories will be constructed. Three classrooms will be renovated into four. One classroom will be modified into a central store. The farm mechanization buildings will also be renovated.
. Dormitories:	One instead of five new dormitories will be built for 48 students and an old dormitory will be renovated for 48 students.
. Faculty Housing:	Two new houses of 2 bedrooms each will be built instead of five.
. Administration building:	The multipurpose building will not be constructed.
. School Farm construction:	a new farm sanitation facility will be built plus a poultry broiler house, layer house, piggery, and an abattoir.

It is possible to assume that the reductions in buildings correspond to the current budgetary allocation due to inflationary rise in building cost since the Loan and Grant agreement was signed four years ago. It is clear the reduction was proportionate between COA and KAS based on original allocations. However, it is also clear that much of the construction originally planned was for needed improvements and additions. The quality of research and teaching facilities, comfort and convenience of students and staff, and appearance of the COA and KAS campuses have been unfavorably affected by the necessary deletions of construction projects. If good progress is made, consideration

might be given to restoring some or all of the funds deleted (see recommendations).

4. A key question to raise is what is the apparent capacity of the COA to operate and maintain the physical plant beyond the end of the project.

Budgetary Support and Financial Capacity

The physical plant management is currently facing serious constraints due to budgetary cuts, substantial debt (J$700,000) and frequent operating account overdrafts. Detailed information supplied by the Bursar clearly indicates that COA faces serious financial difficulty to soundly operate the institution. Despite notable effort made to cut down operation inefficiencies in the physical plant, primarily in reducing the utility bills, the money allocated to the physical plant department remains totally insufficient. Unless the Ministry of Education increases future budgets (i.e., does not sharply reduce budgets from the requested level) for the College and supports appropriate operation allowances in response to the building of new facilities, the COA capacity to operate the physical plant and to maintain it beyond the end of the project will be unlikely.

Managerial Capacity

The lack of capacity of COA to operate the physical plant can be substantiated by the lack of adequate tools and spare parts for vehicles and farm implement repair. According to the Support Service Coordinator, the acquisition system for parts and supplies is too slow and inefficient. The current operation system is totally haphazard and has no budgetary backing. With the technical assistance help, the physical plant manager tried to bring improvement to the current system, but with no positive result. For example, there are still no fire alarm system, no fire hose and no daily garbage disposal. The physical plant manager does not know how much money is allocated in the budget for operations. When new facilities are built by the end of August 1990, additional funds would be required.

The physical plant staff currently in place appears adequate in quantity and quality. According to the support services coordinator COA has no staffing problem as such, with 1 plumber, 1 electrician, 1 tractor operator, 4 ground maintenance workers, 2 shop assistants and 2 drivers. However, by the end of the project, additional facilities will require higher level of maintenance and a more qualified staff including an assistant to the Physical Plant Manager. The types of training will not be different than the skills currently available. The support services coordinator is also responsible for the 13 person campus security group.

Another question is whether the technical assistance contractor supplied appropriate personnel to promote achievement of physical plant objectives to the maximum extent possible. The relationship between the Support Service Coordinator and the Technical Assistant assigned to the Department is viewed by both sides as very good. Together, they reviewed the curriculum in agricultural engineering and developed a new one which comprises four courses, including an emphasis on farm mechanization laboratory. The TA has a direct impact on the training by teaching one course in the Department. A new facility will be built for the new curriculum.

Procurement

To date, slow progress has been made in the procurement of the commodities as outlined in the Loan & Grant Agreement (LGA) signed in August 1984. A mechanism was put in place for procuring the goods under this project. The purpose of this mechanism was probably to ensure a smooth and efficient acquisition process and to avoid unwanted delays during project implementation. The procurement was under the responsibility of a PIU procurement officer who received assistance from the USAID Mission Project Officer. While following the Jamaican contracting method, all procurements were to be in accordance with AID Handbook II and subject to AID approval. The LGA called for a procurement training workshop and the establishment of a detailed procurement planning prior to any procuring action. Moreover, preparation of PIO/C's were delayed in order to wait for the TA arrival who did influence the selection of equipment specifications.

In June 1987, it was reported that progress was made for the first time in the area of procurement. "The first list of goods went forward in early December 1986 and in March 1987, a second list contained in PIL 18 was cleared for mailing." But only in January 1988 a detailed PIO/C for US$497,891, 41% of the total budgetary allowance, was finally signed by the Ministry of Education's Director of Project for sending to AAPC in New York, USA. During the interim a contract was signed with a procurement service agent (AAPC). To date, none of the following items contained in that PIO/C has been received. This includes: vehicles; farm equipment; soil/biology/zoology labs equipment and materials; physics/chemistry labs/demonstrations equipment; library books and equipment; and curriculum development material and equipment. However, other goods were procured under other PIO/C or purchase orders. Some were locally procured. There were 4 pick-up trucks; 3 cars; 3 xerox photocopy machines; 2 farm tractors and three microfiche libraries. Due to administrative delays, the delivery date of April 30, 1988 on the PIO/C, was extended. The lack of adequate project commodities at both COA and KAS have affected the quality of education and hindered project goal achievement.

Commercial Farm Development

The financial difficulties faced by the College of Agriculture have been persistent in recent years. The Ministry of Education failed to allocate adequate funds for a sound and effective operation of the College. There is a serious cash flow problem. To alleviate this situation, the Government of Jamaica recently approved the grant of a commercial farm to the College at Spring Garden with an area of 259 acres. The purpose of this grant is to use the benefits generated by the sale of industrial crops to complement the budgetary subvention to the College. The location has excellent farming potential, being close to the Spanish river, with possibility for irrigation. At the outset, the College received a capital development grant to develop the farm. The major industrial crops in the region are banana and coconut. Originally, Spring Garden farm started as a commercial farm and had suitable infrastructure for farming and commercial exploitation of these crops. For the moment, the highest farming priority is on banana for the production and sale of both the banana suckers and fruits. There are great demands for both in Jamaica and overseas. If adequate incentives are provided for technically and commercially managing the farm, the benefits will be enormous and could certainly offset the cost of managing the college. After proper funding was acquired for capital development and a land use plan was developed, the remaining issue was to have a good manager. The Spring Garden farm must have

a dual goal: enabling the College to generate income and creating a positive image throughout the banana growing region.

The end of the capital development phase at the farm is now coming to an end. The next step is to begin sales of farm produce and utilization of the proceeds. However, there is some question as to whether the current management procedures are adequate and to what extent COA students will participate in the commercial operation and use Spring Garden as a learning environment for technical and commercial management. The commercial operation is under the supervision of the PIU Coordinator. A limited system is in place for faculty of students to participate in farm management and operations. The distance from the College may preclude daily participation of students in daily operations, however, decisions will have to be made for field trips and summer practicum and graduate student's research on these two crops and on introduction of new ones.

ADMINISTRATION/MANAGEMENT

Findings

Considerable effort has been expended by the LSUAC technical assistance personnel to strengthen administration and management at the COA. The supply of recommendations and policy documents is enormous, so enormous that the COA administration is unlikey to be able to implement them all for years come. The evaluation team has not identified problems or opportunities in management that have not already been identified elsewhere, therefore certain ones are identified below for emphasis.

The administrative structure of the College of Agriculture (see appendix) appears sound and there is an agreement among faculty and administrators that it is right for now, and likely to work well into the future. The structure of academic units was also satisfactory to administrators and faculty, and there was ample discussion and thought among segments of the College in arriving at the present structures.

Beyond these formal aspects of the College, communication and interrelationships falter. Principal officers of the College meet regularly and make decisions, but only recently and weakly are communication linkages developing outside this group. Considerable effort must be spent on opening lines of communication from administrators to faculty, from the COA to the Agricultural Schools, and between the TAT and COA faculty and administrators.

The most serious problem facing the College today is its solvency. The COA is presently J$700,000 in debt, and indebtedness is increasing at the rate of about J$220,000/year. The most important cause of this indebtedness is deficient funding by the Ministry of Education. Realistic annual proposed budgets have been routinely reduced by half by the MOE, and in 1987/88 the allocation to the COA was reduced by more than 9 percent from the previous years deficient budget. Research and extension programs are stalled as a result, livestock go unfed and in the words of the Dean, "sometimes we have to starve the students."

There are reported instances of unauthorized and unwise expenditures, and occasional gifts of farm produce, but they are not on an scale that would explain the deficit, or beyond what likely occurs at similar institutions. Also there is some opportunity to increase income from the Spring Garden Farm and from foreign student fees, but these income sources will require further investment, and such income will grow slowly. Undoubtedly financial management and income generation can be improved, but they cannot solve COA's financial crisis within the foreseeable future.

The quality, number and expertise areas of TAT members, short-term and long-term, have been highly appropriate. This technical assistance has not been as effective as it could have been because of occasionally ineffective relationships with counterparts , and an overall approach that stressed TAT output more strongly than building of the COA as an institution and its faculty.

Lags in construction and in participant training are mentioned elsewhere. There is sufficient feeling among Jamaican faculty at the COA and Knockalva and Elim Schools to suggest the problem not be regarded as entirely a shortfall in GOJ performance. To many, particularly lower-down faculty at the

institutions, the reduction in the capital budget and reallocation of participant training fellowships, appears arbitrary. To at least two higher-up administrators, one Jamaican and one American, the problem of construction and participant training has involved both the GOJ as well as U.S. participants in the project.

There is deficient publicity and information about the COA and Elim and Knockalva schools. As a result, applications and enrollments are slack and potential employers are poorly informed about graduates' qualifications. The Registrar states that her former recruitment visits to secondary schools have been discontinued because of lack of funds. Only one newspaper notice was posted during the last year regarding admission opportunities to the COA. The Principal of an Agricultural School laments that the employment of his graduates rests largely on his efforts to personally explain to individual employers what a certificate from his school represents.

Recommendations

To promote communication and assure that the TAT and other resources are utilized to the fullest extent possible, the COA with support and assistance of the TAT should develop an Annual Plan of Work that encompasses all aspects of the COA's development and related activities at and with Elim and Knockalva Agricultural Schools. The Work Plan should be updated annually at a workshop at which all parties to the JAEP are represented, including representatives of Elim and Knockalva Schools. To the extent possible, elements of the Work Plan should be prepared before the workshop. Within the year, parties to the JAEP should follow as closely as possible the schedules and levels of effort described in the Annual Work Plan. The Annual Work Plan should be widely distributed. The cost of the workshop should be paid by funds administered by the PIU.

A high-level representation to the Minister of Education, through the Board of Governors, should be made detailing the severe financial circumstances of the COA. The BOG should ascertain whether the Minister has been aware of the exigency and, assure that the Minister continues to be well-informed in the future. The representation to the Minister should emphasize the important role of the COA and agricultural schools to production, income and development of Jamaica, and continued financial stress at the COA impairs Jamaican economic development.

The Faculty of the COA should engage in farm management analysis of the Spring Garden Farm, with a view to assuring its strong and rapid development, and contribution to the COA's finances.

A public information campaign should be mounted for the COA and Knockalva and Elim schools, aimed at promoting in enrolments and increasing public awareness of the contribution of these important institutions to Jamaican economic development.

Consideration should be given to restoring US$3,000,000 capital investment funds that were earlier deleted from the loan agreement. Restoration should be conditional upon rapid progress of the present construction contracts, and upon the one-year extension of the project that has been recommended. Additionally, reconsideration should be given to providing funding of faculty at the Knockalva Agricultural School and COA for studies in the U.S.A. leading to B.Sc. degrees. The faculty to be considered for such support should be

those who have rendered long and dedicated service to the institutions, and who possess high competence for undertaking such studies. Demonstrating this measure of confidence in the faculty is equitable and will strongly bolster the quality of these institutions, and support future upgrading of the institutions.

A comprehensive effort to evaluate the equivalency of certificates offered by the Elim and Knockalva Agricultural Schools, and the diplomas and certificates that were granted by the Jamaican School of Agriculture. The initiative taken toward this end by the MOE under the leadership of Reuben Gray is commendable and it is strongly recommended that the COA continue and support two efforts.

A P P E N D I X E S

KNOCKALVA AGRICULTURAL SCHOOL

TIME-TABLE

APPENDIX I

PERIOD	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9.00 a.m. TO 9.55 a.m.	YR. 3 English YR. 2AS CHEMISTRY YR. 1A ENGLISH YR. 1B MATH.	YR. 3 English YR. 2AS BIOLOGY YR. 1A MATH. YR. 1B PHYSICS	YR. 3 Biology YR. 2AS ENGLISH YR. 1A PHYSICS YR. 1B MATH.	YR. 3 MATH. YR. 2 PHYSICS YR. 1A BIOLOGY YR. 1B MATH.	YR. 3 MATH. YR. 2 CHEMISTRY YR. 1A ENGLISH YR. 1B MATH.
10.00 a. m. to 10.55 a. m.	YR. 3 MATH. YR. 2AS ENGLISH YR. 1A AGRON. YR. 1B CHEMISTRY	YR. 3 CHEMISTRY YR. 2AS ENGLISH YR. 1A BIOLOGY YR. 1B DAIRY	YR. 3 BIOLOGY YR. 2AS MATH. YR. 1A ENGLISH YR. 1B AGRON.	YR. 3 AGRI. BUS. YR. 2 ENGLISH YR. 1A AGRON. YR. 1B CHEMISTRY	YR. 3 ENGLISH YR. 2AS BIOLOGY YR. 1A MATH. YR. 1B AGRONOMY
11.00 a. m. TO 11.55 a.m.	YR. 3 PHYSICS YR. 2AS MATH. YR. 1A PIGGERY YR. 1B POULTRY	YR. 3 CHEMISTRY YR. 2AS MATHS YR. 1A AGRI. MECHANICS YR. 1B FOOD SCIENCE	YR. 3 MATH. YR. 2AS PHYSICS YR. 1A PIGGERY YR. 1B POULTRY	YR. 3 AGRI. BUS. YR. 2AS MATHS YR. 1A AGRI. MECH. YR. 1B FOOD SCIENCE	YR. 3 PHYSICS YR. 2AS PROJECT YR. 1A DAIRY YR. 1B ENGLISH
12.00 p.m. -12.55 p.m.	L	U	N	C	H
1.00 p. m. TO 1.55 P.M.	YR. 3 AGRONOMY YR. 2AG ENGLISH YR. 1A MATHEMATICS YR. 1B BIOLOGY	YR. 3 ANIMAL SCIENCE YR. 2AG CHEMISTRY YR. 1A MATHEMATICS YR. 1B ENGLISH	YR. 3 AGRONOMY YR. 2AG ENGLISH YR. 1A CHEMISTRY YR. 1B BIOLOGY	YR. 3 AGRI. MECH. YR. 2AG AGRI. BUS. YR. 1A PHYSICS YR. 1B ENGLISH	YR. 3 AGRI. MECHANICS YR. 2AG ENGLISH YR. 1 PRACTICAL
2.00 P. M. TO 2.55 P. M.	YR. 3 PRACTICAL YR. 2AG. MATHEMATICS YR. 1A LIBRARY YR. 1B PHYSICS	YR. 3 PRACTICAL YR. 2AG MAHTEMATICS YR. 1A ENGLISH YR. 1B AGRI. BUSINESS	YR. 3 PRACTICAL YR. 2AG MATHEMATICS YR. 1A AGRI. BUSINESS YR. 1B ENGLISH	YR. 3 AN. SCIENCE YR. 2 AGR. BUSINESS YR. 1A CHEMISTRY YR. 1B LIBRARY	YR. 3 PRACTICAL YR. 2AG CHEMISTRY YR. 1 PRACTICAL YR.
3.00 P. M. to 4.00 P.M.	YR. 3 PRACTICAL YR. 2AG BIOLOGY YR. 1A P. E. YR. 1B PROJECT	YR. 3 PRACTICAL YR. 2AG PHYSICS YR. 1A PROJECT YR. 1B P. E.	YR. 3 PRACTICAL YR.2AG BIOLOGY YR.1A PROJECT YR.1B PROJECT	YR. 3 C YR. 2 L YR. 1 U B S	Yr. 3 PRACTICAL YR. 2AG PROJECT YR. 1 PRACTICAL

OSH/Jem-11/9/87

Appendix 2: Extract of Results from College of Agriculture Graduate Follow-up Study 1985-7

One of the major purposes of this study was to determine the type of employment held by the graduates. The following table gives a breakdown by category of the COA graduates:

TYPE OF EMPLOYMENT	NO. OF GRADS	PERCENT OF GRADS
Teaching Agriculture	48	25.3
Teaching Non-agriculture	2	1.0
Agricultural Research	11	5.8
Agricultural Processing	9	4.8
Agricultural Marketing	5	2.6
Agricultural Credit	6	3.1
Agricultural Extension	20	10.5
Quarantine	8	4.2
Crop Production	26	13.8
Farm Manager	10	5.3
Livestock Production	5	2.6
Landscape Architecture	2	1.0
Ornamental Horticulture	2	1.0
Pest Control	2	1.0
Apiculture	1	.5
Agricultural Dev. Promotions	1	.5
Veterinary Medicine	1	.5
Tourism	2	1.0
Military Service	2	1.0
Higher Education	18	9.6
Self Employed (In Agriculture)	3	1.7
Migrated	5	2.6
Deceased	1	.5
Total	190 (214)	100.0

A total of 190 graduates were located giving 88.78% of the total number of COA graduates. It is impressive that none of the graduates located are unemployed and only five are in non-agricultural disciplines. The total number working with government organization such as the Ministry of Education, Ministry of Agriculture, Urban Development Corporation and Commodity organizations is 104 or 54.7 percent. Leaving 86 working in the private sector or 45.2 percent. This study suggests there is a demand for COA graduates in the agricultural sector which is verified by the fact that none of the located graduates are unemployed and that most are in agricultural positions.

APPENDIX 3

Individuals and Agencies Contacted

Leland Voth, Project Officer, USAID/J
Cecil Turner - Permanent Secretary, Ministry of Education
Douglas Lindsay - Director of Projects, Ministry of Education

Attendees at the Evaluation Workshop:
Evaluation Monitoring Committee (EMC)
- W. E. Nelson, COA, Dean
- Lester Boyne, MOA
- Marie Strachan, MOA, EMC member
- Reuben Gray, MOE, EMC member
- Desmond Hastings, COA agronomy, EMC member
- Donald Campbell, COA, Livestock
- Werner Beinhauer, COA, Veterinarian
- William Smith, COA, Chairperson of EMC
- Elizabeth McMahan, COA
- Stanley Gillings, Project Analysis and Monitoring Co., EMC member
- Leland Voth, USAID, EMC member

USAID Pre-evaluation briefing
- William Joslin, Mission Director
- Myron Golden, Dep. Director
- Steve French, Agriculture & Rural Development Office (ARDO), Chief
- Richard Owens, ARDO Dep. Chief
- William Charleson, Office of Education & Human Resources (O.E.H.R.), Chief
- Paul Crowe, Chief, Office of Program and Economic Planning (OPEP)
- Mansfield Blackwood, Office of Engineering, Energy & Environment
- Leland Voth, JAEP Project Officer, ARDO
- Ruby Baker, OPEP

College of Agriculture, Port Antonio
- W. E. Nelson, Dean
- William Smith, Associate Dean (Academic)
- Hope Jenoure, Registrar
- Basil Farquharson, Bursar
- Donald Campbell, Animal Science (Dept. Head)
- Desmond Hastings, Associate Dean (Research and Development) and Plant & Soil Science (Dept. Head)
- Rainer Homann, Agricultural Engineering
- Eric Latibeaudiere, Humanities & Social Science (Dept. Head)
- Ismail bin Yahya, Agricultural Education
- Elizabeth McMahan, Natural Science (Dept. Head)
- Warner Beinhauer, Veterinarian
- Peter Christ, Plant & Social Science
- N. Smallwood, Librarian
- M. James McKenzie, Project Implementation Unit Coordinator
- Michael Henry, Student Affairs Officer
- Hugh Gallimore, Coordinator of Support Services

Assistant Lecturers
- Byron Wynter
- Trevor Stoddart
- Silbert O'Meally
- Dwight Riddell

LSU Project Personnel

Art Heagler, Project Leader
Macon D. Faulkner, Director of International Programs
Seth Johnson, Entomologist
David Riley, Agricultural Education
Jim Allan, Agronomy
Bill Harrell, Agricultural Engineering
Charles Schexneider, Project Leader (designate)
Satish Verma, Extension Education

Students:

Olivia Scott, Lloyd Campbell, Claudia Powell, D. Scott, Wilbur Thomas, R. Gilzean.

Knockalva Agricultural School

Heckford Brown, Acting Principal
Basil Woodburn, Bursar
Ms. Bowen, Assistant Bursar
Ivy Miller, Vice Principal and Head of English Dept.
Winston Jones, Head of Science Dept.
Teachers:

Umberton Wray, Engineering,
Godfrey Levy, Maths and Agronomy,
Kenute Thompson, Animal Science,
Garth Osborne, Animal Science

Students:

Uriel Lee, Andrew Robinson, K. Poyser, O. Canberry, D. Row, Allison Kellier, Noreen Shakespear, Milton Clark, Frank Williams, John Tierpuron, Everton Adams, Marion Huggen.

Elim Agricultural School

Reuben Gray, Principal
Teachers:

Evelyn Cowan, Vice Principal
Mr. L. Bailey, Agronomy, Head of Dept.
Mr. T. Watson, English, Head of Dept.
Ms. M. Edwards, Physics
Miss Minnett Clarke, Home Economics
Mrs. M. Pusey, Maths
Mr. John Williams, Chemistry, Head of Dept.
Mr. John Gayle, Agri-business
Mr. B. Gregory, Farm Mechanics
Mr. G. Dales, Farm Mechanics
Mr. R. Service, Animal Science, Head of Dept.
Miss P. Mullings, Home Economics

Others:

Alrica Dixon, Lab Technician
Mr. Barneswell, Farm Manager
Keith O'Gilvie, Bursar
Ms. V. Peart-Frazer, Librarian
Nurse Taylor

Brief meetings with students working on school farms.

Jamaica Aquaculture Ltd.

Raul Tyson
John Carberry
Raymond Anderson

Ministry of Agriculture

Clarence Franklin, Permanent Secretary
George Pencil, Director of Extension and Production
Edie Giddens, Coordinator of Rural Farm Family Program

Agricultural Credit Bank

Mr. Edwin McKie, Chairman of COA Board

Ministry of Education

Mr. Neville Gallimore, Minister of Education

Jamaican Agricultural Development Foundation

Mr. Keith Roach, Managing Director

APPENDIX 4

DOCUMENTS CONSULTED

"Report on the Jamaica School of Agriculture (JSA)." College of Agriculture, Institute of Food and Agricultural Sciences, University of Florida. Gainesville. October, 1978.

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Holcomb, John W. "A Report on Curriculum Evaluation for the Vocational Agricultural Schools of Jamaica and their coordination with the Jamaican School of Agriculture." American Association of Colleges for Teacher Education. Washington, D.C. July, 1978.

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Verma, Satish. Memorandum to Dr. Arthur Heagler, COP. "Outreach (Extension) Programs of the College of Agriculture."

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Heagler, Arthur. Jamaica Agricultural Education Project. (Draft final semi-annual report, ending about April, 1988)

Turf '87. (Report of the Elim Agricultural School, Elim 1988).

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Research and Outreach Program file of miscellaneous memoranda and papers provided by Wesley Nelson, Dean. College of Agriculture, Port Antonio, Jamaica.

Administrative matters: file of miscellaneous memoranda and papers provided by Wesley Nelson, Dean. College of Agriculture, Port Antonio, Jamaica.

COA's Operating Policy Procedures: file of miscellaneous memoranda and papers provided by Wesley Nelson, Dean. College of Agriculture, Port Antonio, Jamaica.

Management Advisory Committee: file of miscellaneous memoranda and papers provided by Wesley Nelson, Dean. College of Agriculture, Port Antonio, Jamaica.

Administrative Structure of College of Agriculture: College of Agriculture, Port Antonio, Jamaica, January 20, 1988.

"Administration". File of miscellaneous memoranda and papers provided by William Smith, Associate Dean. College of Agriculture, Port Antonio, Jamaica.

"Research Development and Outreach." File of miscellaneous memoranda and papers provided by William Smith, Associate Dean. College of Agriculture, Port Antonio, Jamaica.

College of Agriculture Student Handbook, 1987-1988 Edition." College of Agriculture, Port Antonio, Jamaica. (undated)

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Why is the Program a Success?

1. Availability of adequate land.

2. Availability of Inputs.

3. Adequate supply of water

4. Adequate number of all tools, equipment needed.

5. The commitment to achieve the objectives by the supervisors.

6. The commitment of the students to achieve the objectives and excellent grades, since failure of the crop(s) due to negligence on the part of the students means failure of the degree program.

Other Requirements:

1. Students must keep complete records including:

   a) Dates of land preparation
   b) Date of sowing nursery and main field
   c) Date of transplanting (where necessary)
   d) All chemicals and fertilizer used

2. Students must sign for all inputs and tools. Loss of any tool incurs a fine to replace the tool.

3. Students must visit the field plot on the scheduled time as attendance is taken in the field. Attendance less than 85% merits a reduction in points which compute final grades.

4. A final examination is a requirement at the end of the program.

5. All records are to be submitted for grading.

6. Group cooperation is also assessed - and merits a discredit if they fail to cooperate.

APPENDIX 6

FARM PRACTICE PROGRAM AT G. B. PANT UNIVERSITY

(Prepared by Byron Winter, Asst./Lecturer, College of Agriculture)

General Objectives (as I understand)

- To facilitate the application of knowledge obtained in the classroom.
- To stimulate production on a cooperative basis.
- To use effectively local material to enhance production.
- To work efficiently under supervision.
- To earn while you learn.

How the Program Works:

A) Responsibilities of Faculty of Agriculture

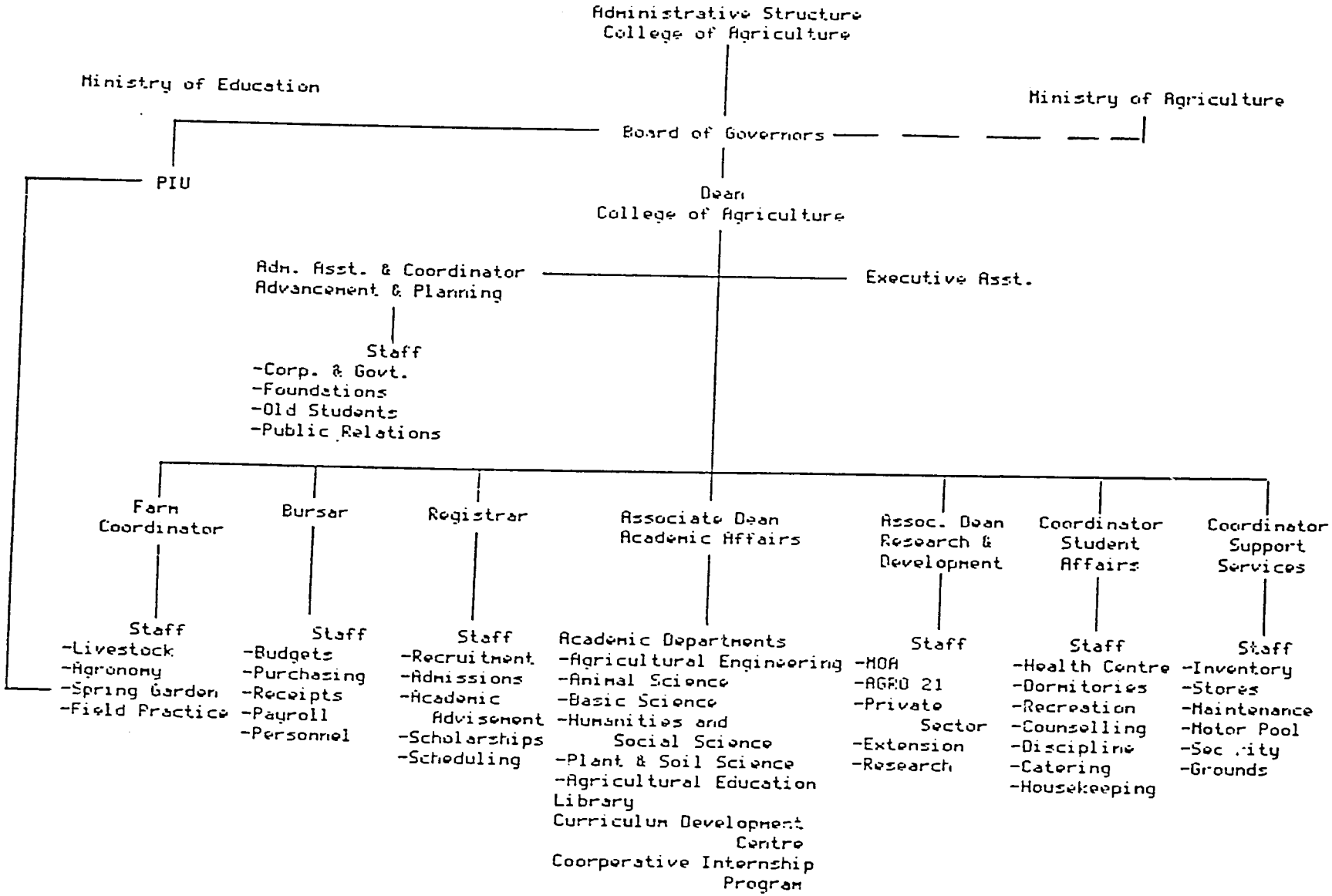
1. The program is managed by the lectures in Agronomy.
2. Only final year (Third year student) participate.
3. The University has ear-marked an adequate area of land for the program.
4. All major land preparation is done by the faculty.
5. All input - i.e. seeds, seedlings, fertilizer, chemical are provided by the faculty.
6. The program is supervised from beginning to end by faculty members.

B) Responsibilities of Students

1. Students in groups of eight (8) are assigned to two (2) natures of land for the duration of the program - which is for one year.
2. All inputs are given to students whose responsibility is to produce for a profit and for their grades.
3. Three or more different crops must be grown in the given duration.
4. After major land preparation; all work is done by the students including marketing.

ABBREVIATIONS

MOA	Ministry of Agriculture
COA	College of Agriculture
MOE	Ministry of Education
JSA	Jamaican School of Agriculture
GOJ	Government of Jamaica
KAS	Knockalva Agricultural School
TVU	Technical Vocational Unit, Ministry of Education
UWI	University of West Indies
JADF	Jamaican Agricultural Development Foundation
LSU	Louisiana State University
MPS	Ministry of Public Service
NIBJ	National Invest Bank of Jamaica
PSG	Program Support Grant
OSU	Oregon State University
TU	Tuskegee University
SHSU	Sam Houston State University
SU	Southern University
LSUAC	Louisana State University Agricultural Consortium
EAS	Elim Agricultural School



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