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INDONESIAN HIGHER AGRICULTURAL

EDUCATION PROJECT

MUCIA

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## **L INTRODUCTION**

### **A. BACKGROUND ON AGRICULTURAL EDUCATION**

Indonesia entered the community of independent nations in December 1949 with an educational system poorly developed to cope with the tremendous challenges facing the new nation in a modern world. Dutch concerns with their colony of the "East Indies" prior to the 20th century had been largely extractive, with little effort put into developing a modern institutional infrastructure apart from that needed to administer the colony. It was only in the last twenty years of colonial rule that the Dutch established three small institutions of higher learning in medicine, law, and engineering. The first university was not established until 1946—a full century after universities had been founded by the British in India.

In a country where over 90% of the population was rural and engaged in farming, it is ironic that the first institution of higher learning in agriculture was not established before 1941 (at Bogor), and then merely as a branch of the college of medicine in Jakarta. As late as 1946 only nine students were enrolled in that faculty of agriculture. Despite a bold move by the Republic of Indonesia during the Revolution to open a second university with a faculty of agriculture in Yogyakarta in 1946, the total number of graduates in agriculture from Bogor and Yogyakarta by 1950 was ten. In the entire country there were only six hundred university-trained agriculturists, all but a fraction of whom were Dutch who left Indonesia not long after independence.

The Japanese occupation during World War II, followed by the Indonesian War for Independence, sorely strained the Indonesian economy. Both the plantation and food crop sectors suffered from physical destruction or neglect of the transportation and irrigation infrastructures, and the departure of the majority of trained engineers needed to service them impeded a speedy recovery. On top of this was a population rapidly

outgrowing the nutritional base available to sustain it, and the overall challenges of welding thousands of islands and dozens of distinct ethnic groups into a modern nation-state.

Facing these enormous obstacles, the Indonesian government quickly identified the development of higher agricultural education as a priority. Without its own capacity to train researchers, teachers, extension workers and administrators in agriculture, self-sufficiency in food would elude Indonesia. An important early step in this direction was taken with the signing of a contract for participant training and technical assistance between the University of Kentucky and the Agricultural Institute at Bogor (IPB) in 1957. This assistance, funded by USAID, continued for nearly a decade and strengthened the foundation upon which Indonesian higher agricultural education has been built since independence. One hundred seventy staff members of IPB were trained at American universities under this program. Another important source of support was the Ford Foundation grant to develop the Faculty of Economics at Gajah Mada University, in cooperation with the University of Wisconsin, and a subsequent grant to develop economics at the University of Indonesia.

While Indonesia was making strides to improve the quality of education at IPB, the Technical Institute at Bandung, Gajah Mada University, and the University of Indonesia, regional demands to expand the system of higher education to the provinces rapidly grew. The Ministry of Education and Culture eventually responded in 1960 with a decree authorizing each of the twenty-five provinces to establish a state university. Almost overnight fifty-two new agricultural facilities were established. While tremendous idealism and budgetary sacrifice got many of these facilities off the ground in their first few years, neither teaching staff nor educational and financial resources existed to sustain them in any real sense. Nonetheless, all facilities of the "agrocomplex" (faculties of agriculture plus veterinary and related sciences) in Indonesia managed to produce some 2500 graduates with an (approximate) B.S. equivalent in the first two

decades after independence. Considering where the education system had started in 1950, this was an enormous accomplishment.

By the early to mid-60's Indonesia was entering its most turbulent times economically and politically, from which it would not begin to emerge until 1967. At that time, a new administration committed to planned and stable economic development sought to make up for a great deal of lost time and wasted opportunity.

E. HISTORY OF THE PROJECT: PEMBINA (FEEDER) INSTITUTIONS

In preparing for the large task ahead, the Government of Indonesia requested surveys of the state of Indonesian agriculture, and of the higher education system, to be made by teams of American scientists and USAID officials in 1968 and 1969. At the time, Indonesia's government was preparing a five-year development plan, with major emphasis on improving human nutrition through increased food production. The government recognized the direct relationship between a strong, indigenous program of higher education in agriculture and the building of a prosperous agricultural economy. In a country as large and diverse as Indonesia, it was impossible to think in terms of developing only one or two institutions. By the same token, the process had to begin from relative strength rather than weakness, and limited resources could not be so thinly spread as to be dissipated without influence.

It was in this context that the pembina or "feeder" concept was hit upon as the initial strategy for development of higher agricultural education. IPB and the Agro-complex at Gajah Mada University were designated as pembina, with responsibility for assisting agricultural faculties of provincial universities to upgrade their staff and programs in teaching, research, and public service. The report of the 1968 team surveyed the strengths and weaknesses of the current programs and facilities at IPB,

Gajah Mada and the provincial universities as a preliminary assessment of the kind of outside assistance that might best be provided by an American university or universities.

The report saw IPB as a large and complex institution with reasonably good classrooms, laboratories and equipment. The six faculties of Agriculture, Veterinary Medicine, Fisheries, Animal Husbandry, Forestry and Agricultural Engineering, and Produce Technology were each headed by a dean who in turn reported to the Rector--a centralized administrative system that would be built on as a model for future administrative development in Indonesian universities. The combined enrollment in 1967 was 2,000 for the five class levels, taught by a faculty numbering three hundred forty-one. The staff was relatively well-trained, with forty-six (12%) holding M.S. degrees from abroad, and twelve holding the Ph.D. IPB was looked to by other universities as a source of intellectual leadership and academic competence, putting it in an excellent position to give guidance.

The report went on to detail the areas in which IPB needed to be strengthened if it were to perform the role of a pembina more effectively. Its library resources were dated and inadequate to the task of being both a teaching and a research institution. Equipment and supplies for teaching and laboratory work had deteriorated. The curriculum was in need of revision that would update its offerings and review the duplication of courses among the five faculties. Both the content and supervision of the doctoral program needed attention, with the recommendation that course requirements be developed.

Gajah Mada University (UGM), the second pembina institution, had programs in Agriculture and Veterinary Medicine begun in 1946, and Forestry and Agricultural Engineering and Technology started in 1963 as separate faculties. The programs in the Agro-complex had received less outside assistance than had those at IPB, and there was a need to integrate the various programs in that complex in order to build toward excellence. The report emphasized the need to add staff and provide training

opportunities to improve the quality of existing staff. Classrooms, laboratory space and equipment, maintenance facilities, and library holdings were all in need of upgrading to put UGM in a better position to function as a feeder university.

It was clear from the report of the team in 1968 that while strides had been made in developing a system of higher education in Indonesia, the key and complex task that lay ahead was nothing short of sustained institution-building:

There is an urgent need for a strong, indigenous, agricultural education program. Indonesia's agricultural economy will prosper in proportion to the quality of her specialized manpower in this area. And the specialized leadership talent will come largely from the higher education institutions. However, the human resources which flow into the higher education channels must come with basic background and readiness to absorb advanced training. Not only must the students be literate with mastery of the basic academic subjects, but they must possess the attitudes which foster learning. This is where coordinated long-range educational planning becomes vital. There must be planned coordination between elementary, junior high, senior high and higher education and the formal education programs must be related to the manpower needs of the nation. Further, the focus must be on the future—the manpower needs in both the public and private sectors for the 1970's and for the remainder of the twentieth century.

A major key to Indonesia's development resides in educational institution building. This is a demanding business which requires the maximum amount of Indonesian genius, applied through cooperative faculty action in units of time ranging from two to ten or more years, and cultivated by means of built-in evaluation schemes. A unique and essential feature of institution building is the development of the all-important linkages with constituents who provide financial support and benefit from the services of educational institutions. Such linkages are particularly important in the building of Indonesian agricultural education.

Obviously, foreigners can assist the Indonesians with their educational institution building, but the major part of the planning and implementation must be done by Indonesians for Indonesia. Experimentation and flexibility are essential. Copying and blind devotion to tradition should be avoided. A home-grown mix should be developed consisting of the cultural heritage, creative new Indonesian ideas and adaptations of appropriate programs from other cultures, resulting in the type of educational institutions which really serve the fundamental needs of the new nation. Modern practices should be adopted in connection with organization, administration, and finance. Faculty development and curriculum planning should be given the highest priority with foreign assistance carefully phased and coordinated with the policies which are created to guide institutional growth, and policies and practices relating to student personnel affairs. Student personnel affairs, including recruitment, selection, admission, graduation, and placement should be directly related to manpower planning. The result of all this should culminate in the nurturing of unique Indonesian educational institutions which are as distinctive as American, British, Indian, German or French institutions. In the final analysis, institution building is the key to national development which depends upon productive human resources.

In summary, education in Indonesia is big business charged with the responsibility of preparing Indonesian manpower for an era of opportunity. The general administrative structure, curricula, faculty, and student policies may be compared to a magnificent, many-chambered nineteenth century palace which has been partially reconstructed to fit the most urgent demands of the twentieth century.

C. PREVIOUS INVOLVEMENT OF MUCIA AND MUCIA MEMBER UNIVERSITIES

The involvement of MUCIA member campuses in Indonesian higher education dates back to 1957, when the University of Wisconsin began working with Gajah Mada University to develop its Faculty of Economics, through a grant from the Ford Foundation. During the six years of that contract, more than forty men and women were sent abroad for graduate study in economics, and at times as many as seven faculty members from the University of Wisconsin were providing technical assistance at Gajah Mada. The project also drew on the expertise of a faculty member from the Department of Economics of another MUCIA member, the University of Illinois. The UGM project was followed up with a similar one providing assistance to the faculties of economics at the University of Indonesia, and Nommensen University in Medan, both of which also involved the University of Wisconsin as part of a three member consortium.

Subsequent involvement of MUCIA member universities in Indonesia included Indiana University, assisting in the development of the teaching of statistics at the Institute of Technology and Pajajaran University, both in Bandung, and participating in a project at the Central Bureau of Statistics in Jakarta.

The American team reporting to the Government of Indonesia and USAID on conditions in higher agricultural education in 1968 suggested ways in which an American University or consortium of universities could cooperate with IPB and UGM in fulfilling their role as pembina to the provincial universities and achieving their own upgrading. Ultimately, the task of assisting with this development was delegated to MUCIA under the title of MUCIA/AID Indonesian Higher Agricultural Education Project.

## **II PROJECT GOALS AND STRUCTURES**

### **A. THE PROJECT CONTEXT**

Building institutions to meet the many difficult problems of a developing nation, and with flexibility to meet changing conditions, represents a long term endeavor, and this project was envisioned as a long-term project. However, just as a strong institution must have the flexibility to meet changing conditions, so this project had to have flexibility. Inputs which were appropriate, in kind and amount, for the start of the project often were not appropriate at a later time.

The MUCIA project was designed to assist the Indonesians in their efforts toward the further development of Higher Agriculture Education in Indonesia, and the first task of MUCIA was that of assisting Indonesia in the development of specific and detailed plans for reaching their objectives. Although the Government of Indonesia knew in a general way what it wanted to do, it had at that time never prepared or developed specific and detailed plans for its institutions. It was a totally new experience: to prepare long-range plans with the establishment of goals and objectives; to develop programs and projects designed to meet those goals and objectives; to determine the minimum human and material resources required by these programs and projects, with the necessary hard choices of priorities; to design minimum administrative structures to support the programs and projects; and to prepare justifications for the overall program and its parts.

### **B. PROJECT GOALS**

The major activities of MUCIA on this project over ten years were those of assisting in the implementation of certain specific projects, identified by Indonesia as

of highest priority, and cooperatively planned by the appropriate Indonesian and MUCIA staff members.

The planning of the overall program and the specific high priority projects involved many Indonesians at both the ministerial and university levels. The Agricultural Consortium of Indonesian universities also played a key role. The administration and staffs of the pembina institutions carried on much of the detailed planning. However, counsel and advice were sought from many staff members of the non-pembina institutions.

The role of the MUCIA staff in the development of the basic Indonesian plans was that of advisors in institution building and educational planning. The detailed development of inputs, expected accomplishments, and establishment of target dates was a truly joint effort. Only in this fashion could genuinely cooperative projects be developed.

In addition to those projects in which there was to be joint cooperation in implementation, both the Government of Indonesia and MUCIA had other projects developed individually, but of interest to the other partner. Each was to keep the other informed of such activities and wherever it seemed desirable, there were joint consultations. MUCIA was particularly careful to see that any independently funded project of MUCIA universities involving work in Indonesia secured the approval of appropriate Indonesians before being initiated.

The projects chosen for joint implementation were carefully considered and it was expected that they would be carried through to completion. However, it must be recognized that these projects were all based on several fundamental assumptions applying equally to Indonesia and the United States. These were: that both governments would enjoy continuing economic development and stability; that both governments would retain their high priority interest in carrying out this project; and that both governments would be able to provide the resources as specified in this annual project agreement. The plans for the first year were considered quite definite, barring unforeseen events.

The further one looked into the future, the more likely it became that significant unforeseen events would occur. As a result, the plans were updated annually and a reasonable degree of flexibility of operation was required in the schedule of operations. It was predictable that the amount and kinds of inputs required both from the GOI and from foreign donors would change as the project matured. For example, the present staff upgrading programs were to change into graduate credit programs. As Indonesian graduate programs developed, fewer Indonesians would go abroad, and most of those going abroad would go for highly specialized non-degree programs. Greater changes were expected in the second half of the decade than in the first five years.

Project work was divided into four main areas: university administration and structure; instructional programs for Bachelor of Science development; instructional programs for graduate program development; research and public service.

The specific projects proposed under each of these areas and the targets established were presented for each institution. In addition, certain general objectives were also set forth.

#### 1. UNIVERSITY ADMINISTRATION AND STRUCTURE

During the first five years there was continuing study and experimentation with possible ways of improving the organizational structure of the universities. Study groups were to consider a host of organizational responses to improve educational efficiency. Among the approaches considered were the combination of like functions of various divisions in the university into one central office, and the reorganization of the various administrative divisions of the university in order to strengthen functional units. If desirable, the administrative divisions would be combined or otherwise reorganized to decrease the total number of staff involved in administrative activities. The system of tenure for administrative staff would be evaluated, and changes implemented if

desirable. Finally, the organization or strengthening of centralized university service units was to be undertaken.

Goals were set individually for the Agricultural Institute of Bogor (IPB) and Gajah Mada University (UGM), taking into account the different conditions at each of these institutions.

a. The Agricultural Institute at Bogor (IPB)

Over the five years of the project, two hundred Indonesians were to go to the United States to study university administration. Recommendations for institutional reorganization were to be made in phases. By 1972 the study group was to make recommendations about the centralization of like functions into a single office. By 1973 the group was to recommend possible changes of administrative divisions. Finally, by 1974 recommendations were to be made about the tenure of major administrative positions.

The phased strengthening of the general service units of IPB was planned as an integral part of administrative development. By 1971, books, journals, and library equipment would be purchased. By 1972, a central stockroom and facilities for visual aids and equipment repair service were to be developed, followed by improvement of printing facilities in 1973. By 1974-75, the upgrading of general services was to be completed.

b. Gajah Mada University

During the first five years, one hundred Indonesians were to study administration abroad. To begin the study and modifications of university administrative structures, recommendations on the centralization of student registration and records were to be made between 1971 and 1973. During 1972-73, analysis and recommendations on linkages between Agro-complex faculties and others in the university were to be planned, and

in 1973-74, reorganization of administrative structures within the Agro-complex would be considered. The initiation of a course credit system, revision of the grading system, and plans for a four-year baccalaureate program in the Agro-complex were scheduled for 1974-76.

To strengthen the general service units for the Agro-complex, improvements in the library, including the purchase of books, journals, and equipment, training staff, general reorganization and possible construction of a new library were planned for 1971 to 1974. In 1972-73, a language center, photo-copy service, and audio-visual center were to be developed. A central store-room, a repair service, and a data processing unit were scheduled for 1973-74, and a printing facility for the following year.

## 2. INSTRUCTIONAL PROGRAMS: UNDERGRADUATE LEVEL

A solid baccalaureate program is the bedrock of any national university system. In order to develop the capability to train large numbers to that level, several steps were planned. At IPB there was to be a pilot project to develop courses and curriculum. Since UGM already had degree plans for all fields, over the five years these plans were to be reviewed and modified, and a fourth year added to the fields where it did not already exist. At both IPB and UGM, the progress made on curriculum and courses was to be evaluated after the fourth year of the project. Courses were to be upgraded and combined, and areas of study centralized to eliminate unnecessary duplication. All appropriate texts, outlines, teaching aids, and reference materials were to be written, adapted, and/or translated into Bahasa Indonesia. Materials and staff training were to be provided first at the pembina institutions after which the Agricultural Consortium was to coordinate their introduction to non-pembina institutions.

a. The Agricultural Institute at Bogor (IPB)

The primary goal at IPB was development of a four-year pilot project for the B.Sc. degree. A curriculum plan and regulations were to be drawn up, materials developed and recommendations made for the completion of the pilot project. In the third and fourth years of the project, courses were to be introduced to some non-pembina universities. The immediate outcome of the B.Sc. program was to graduate three hundred persons with this degree by 1975, with the number rising to 2000 by 1980.

b. Gajah Mada University

The first step at UGM was to study curriculum required for baccalaureate programs to prepare candidates for positions in Agricultural Science, Agricultural Production, and Agricultural Business. It was projected that three to four basic courses per year in agricultural science would be reviewed and reorganized. Staff development in the philosophy of teaching, methods, and teaching aids, would be achieved through seminars, workshops, and short-term assistance. Towards the end of the period, improved courses would be introduced to non-pembina institutions, student orientation and counseling programs would be developed, and a student placement program to assist graduates to locate employment upon termination of degree would be established.

3. INSTRUCTIONAL PROGRAMS: GRADUATE LEVEL

The focus was to develop the capability for advanced training for leadership roles, especially at the doctoral level. At IPB a Director of Graduate studies was to develop regulations, establish programs, and provide direction for the reorganization and upgrading of the doctoral programs for all of Indonesia. At first, it was necessary to do all or a substantial part of the work abroad. At UGM, a more extensive upgrading was needed. The goal was to have a Ph.D. program there by 1976/77.

a. The Agricultural Institute at Bogor (IPB)

To upgrade programs at IPB, the curriculum first had to be reevaluated, and then reorganized and upgraded. By 1975, the plan was to establish a program for a M.Sc. degree to meet international standards.

The first step in reshaping the doctoral program at IPB was to set curriculum standards and regulations, and to arrange the transition from the current Indonesian doctorate to an in-course doctorate. Basic courses for the transitional phase were to be offered in 1971-72, and a research program developed the following year. While major courses were being developed in 1974-75, ten Indonesian doctoral students would be sent to the US. By the conclusion of Phase I, IPB would establish complete in-course doctorates in five major areas, and have two hundred or more students in the doctoral program.

b. Gajah Mada University

First the Sarjana (Ir) program would be upgraded, through review and reorganization of the curriculum, as the basis for establishing an M.Sc. degree program to meet international standards. Staff were to be trained abroad, and seminars and workshops would be conducted to improve the quality of graduate teaching. In addition, the University wished to upgrade and expand its doctoral program. Senior students were encouraged to undertake an upgrading program, and seminars would be initiated in statistics, data processing, and research methods. The plan was to develop non-degree training in the US or third countries to upgrade twenty to thirty doctoral candidates, over a six-month period.

4. RESEARCH AND PUBLIC SERVICE

To develop the capability to conduct research programs at IPB, four areas of research were identified for emphasis in the subsequent four years: 1) production and

utilization of cereals; 2) production and utilization of proteins; 3) production and utilization of commercial crops; 4) effective use of natural resources in agricultural development. Projects were to be developed at UGM for research on food and export crops, animal agriculture, forest resources in Central Java, and for research to improve conditions in underdeveloped areas of Sumatra and Kalimantan.

a. The Agricultural Institute at Bogor (IPB)

First, it was necessary to develop an administrative unit for research programs, and then to provide support in the four major research areas. A later goal was to expand research for the development of an experimental farm, as well as for the training of extension staff.

b. Gajah Mada University

Plans to improve research and public service included those previously mentioned to upgrade library facilities. Closer coordination and cooperation with the Ministry of Agriculture was intended, in order to employ university staff resources to study effective extension and development programs of the GOI.

5. OTHER PROJECT GOALS

Participant training was seen as the key element to the entire project, with most if not all participants from the two pembina Institutions. The eventual goal was to develop programs for doctoral training entirely in Indonesia, staffed by returnees from this ambitious effort of staff upgrading. The chief problems encountered by trainees revolved around insufficient preparation, especially in English and in basic sciences.

The use of short term staff was also a major component of the project. Major responsibility for program development was placed on Indonesian counterparts. Continuing research projects were to be developed between short-termers and Indonesian

colleagues. Short-termers were to advise one or more Indonesian graduate students, and were to return every two to three years to enhance program continuity. The initial plan was to have short-termers spend three months at a time in Indonesia, dividing their time between the two institutions.

Institution building in the US: Returning short and long-term staff were to spend part of their time during their first year back at their home institutions in analysis of data, and revision of courses to introduce or expand the Indonesian content. There were four professors who utilized the 211-D grant funds available for this purpose: Kirkpatrick Lawton from Michigan State University (June 1973), Herbert Bird from the University of Wisconsin (October 1973), Adlowe Larson from the University of Wisconsin (June 1976) and Robert Clodius from the University of Wisconsin (May 1977). Beyond this, ways were to be sought to bring Indonesian faculty to US campuses to teach and share research experiences to further internationalize their host campuses.

### C. PROJECT ADMINISTRATION AND STRUCTURE

This Project departed from the traditional AID-university project by consolidating overall administrative responsibility in a single Project Administrator, who was charged with overall responsibility for all aspects of the Project, both in the field and at home. The customary AID - university arrangement had been to divide direct responsibility between a Team Leader in the field and a Campus Coordinator at home. The Project Administrator was based in the US, but was expected to make at least two trips a year to Indonesia, each of at least two months, and was considered as Chief-of-Party on a long-term staff assignment for the purpose of this project.

The Project Administrator was responsible for overall policy direction and administration of project activities, and coordination of the MUCIA activities both in Indonesia and in the US, including all phases of planning, implementation and evaluation.

In Indonesia in cooperation with the Indonesian authorities, the Project Administrator was to develop comprehensive long range plans for the development of Indonesian higher agricultural education (including budgetary requirements), with special attention to the role of MUCIA/AID assistance with that process. He would provide counsel on institution building to the DGHE and other related GOI agencies, with special reference to problems related to developing a national system of universities to serve highly diverse agricultural needs.

A critical task of the Project Administrator would be to assist in the development of linkages among the relevant Indonesian institutions, including the ministries, departments, consortiums, LIPI, and the universities. Finally, he would coordinate MUCIA activities with those of other bilateral and multilateral donors in the agricultural education sector to maximize impact and minimize redundancy of effort.

In the United States, the Project Administrator would be the principal liaison/administrator responsible for advising the MUCIA Board of Directors and Advisory Committee concerning all aspects of the project. Responsibilities would include orientation of appropriate authorities in each of the five MUCIA member universities, nomination of MUCIA personnel to serve in Indonesia, policy guidance of the participant training program, and counsel in MUCIA institutions concerning development of Southeast Asian/Indonesian Studies programs including research activities. The Project Administrator would have an Assistant Administrator in the MUCIA lead institution and a Deputy Administrator in the MUCIA-Yogjakarta office.

Four types of US staff were provided for in the Project Plans. They were: regular MUCIA institution staff members, on two year assignments for duty in Indonesia; MUCIA institution staff members assigned as experts for short terms in Indonesia; advanced doctoral students from the MUCIA institutions who would come to Indonesia to carry out research, the results of which might form the basis for doctoral dissertations;

and research assistants operating within the US who were to be assigned research duties on cooperative MUCIA-Indonesia Projects.

Full-time MUCIA staff members were to be stationed at both IPB and UGM as Project Coordinators, with the principal function of serving as advisors on institution building and educational planning. In addition, each was to carry the responsibility of administering the local aspects of the MUCIA Project. A second full-time MUCIA staff member was to be assigned to UGM, with duties to assist the Project Coordinator. All of the MUCIA staff members stationed at IPB and UGM were expected to advise in their own professional field as time permitted, but the first responsibilities were those of serving as an advisor in institution building and educational planning.

The Deputy Project Administrator served primarily as an educational advisor and consultant on institution building to the DGHE and, as requested, to other GOI officials. In addition, he or she served as the Chief MUCIA Administrator in Indonesia, and in the absence of the Project Administrator was responsible for the overall policy direction, administration and implementation of MUCIA programs in Indonesia. In addition, a basic orientation was to be provided for short-term consultants upon their arrival in Jakarta, and also on the ground management and evaluation of the short-term consultant program, including reporting and facilitating long-term continuity. The DPA coordinated and followed-up on the participant training program, and oversaw the inter-relationships with in-country faculty upgrading courses at IPB and Gajah Mada University. His responsibilities extended to the coordination of graduate teaching and research programs with emphasis on MUCIA inputs. Beyond this, the Deputy Project Administrator monitored commodity assistance in cooperation with Project Coordinators at IPB and UGM, helped the Indonesian Agricultural Consortium to plan and implement a carefully directed development program for the non-pembina institutions, and chiefly organized MUCIA inputs for the annual review of the project in cooperation with the Indonesian authorities and USAID.

### **III PROJECT ACHIEVEMENTS IN PHASE ONE: 1971-1976**

#### **A. LONG-TERM APPOINTMENTS**

##### **1. Project Administrators**

The Project Administrator was to be a high-ranking American university administrator with some background in agriculture. His duties were to supervise both the Jakarta office and the Project headquarters in the United States, to coordinate activities, to set policy, and to hire personnel.

Dr. Robert L. Clodius, former Vice-President of the University of Wisconsin-Madison and Professor of Economics, Agricultural Economics and Educational Administration, was appointed Project Administrator under the IDA, with a commitment to five years service. This appointment, effective in July 1971, followed that of Dr. Ira Baldwin, Professor Emeritus and former Vice-President of the University of Wisconsin. Dr. Baldwin headed the 1968 and 1969 survey teams and was the Project Director under the 1969-71 contract, as well as a principal architect of the MUCIA/Indonesia Project.

In 1971-1972, Dr. Clodius divided his time between the American headquarters at the University of Wisconsin-Madison and Indonesia. In Indonesia, he headed the Jakarta office and made frequent trips to IPB and UGM, in addition to serving as liaison with officials of Indonesia's Ministries of Education and Agriculture and other related agencies.

During the years 1972-1975, experience with the initial contract clearly indicated the desirability of adding to the long-term staff a Deputy Project Administrator or Resident Director, who would reside in Jakarta and oversee operations there, while the Project Administrator continued to travel between the United States and Indonesia. The position of Deputy had been included in the IDA following the first project Review in January 1971, and recruitment began following the signing. Dr. John T. Murdock,

who had been Coordinator at IPB, became the Acting Resident Director in the Fall of 1971 until the end of that year.

Dr. Donald Smith, former Administrative Vice-President of the University of Minnesota and specialist in Communication Arts, was appointed as the Project's first Resident Director in February 1972. He left that post in March 1973 to become the Vice-President of Academic Affairs at the University of Wisconsin. He was succeeded on an acting basis by another Wisconsin Vice-President, Professor Robert Taylor of Agricultural Journalism. Professor Taylor was followed by Dr. Sherwood Berg, Agricultural Economist and former Dean of the Institute of Agriculture at the University of Minnesota. In July 1975 Dr. Berg resigned to accept the presidency of South Dakota State University, and his position in Jakarta was not filled. At the time, budget cuts made by the United States' Congress had placed the Project's future in some uncertainty, while planning on the second five years of the Project was not yet complete or officially approved. Dr. Clodius, therefore, moved the Project Administrator's office to Jakarta, and Ms. Janet Franke took charge of the Madison office as Assistant Project Administrator. Appointment of an Indonesia-based Director was made when the second five years of the Project commenced. Dr. John T. Medler, Professor of Entomology at the University of Wisconsin, accepted this position, and took up his duties in Jakarta in January, 1977. He was succeeded by Dr. Kenneth E. Harshbarger, Professor of Animal Sciences at the University of Illinois, for the period from early in 1979 until near the end of 1981.

## 2. Program Coordinators

At IPB an agricultural scientist, with experience in university administration, was appointed for a two-year term to coordinate Project activities, advise IPB administrators, assist in selection and preparation of overseas participants, supervise the short-term advisor program, and consult in his/her own academic field.

The first scientist to hold the post of Program Coordinator at IPB was Dr. John Murdock who held that position from January 1970 to December 1971. Dr. Murdock later became Associate Director of International Agriculture Programs at the University of Wisconsin and Executive Director of MUCIA. In 1980, he again returned to IPB working on another AID funded project. He was succeeded at IPB by Dr. Herbert Bird, chairman of Wisconsin's Department of Poultry Science, who had already served as a short-term consultant there. Following completion of his assignment, Dr. Bird was succeeded by Dr. Daniel Benjamin, Professor of Entomology at the University of Wisconsin.

A chief aim of the MUCIA/Indonesia Project was to assist Indonesians in developing their universities and in preparing staff members for administration. One result of this emphasis was replacement of the American long-term appointee as Program Coordinator with a member of IPB's staff. In April 1975, Dr. Benjamin became a consultant and Ir. Suhadi Hardjo, Director of Undergraduate Studies at IPB, took over as Program Coordinator/Liaison Officer for the Institute and MUCIA.

At UGM, a Program Coordinator with duties similar to those outlined above for the IPB Coordinator and Deputy, preferably with experience in educational planning, were to be appointed. Dr. Kirkpatrick Lawton, Director of International Programs at Michigan State University, was the first to hold the position of Program Coordinator at UGM, commencing in January 1970. Dr. Lawton extended his original term to three and one half years. He was succeeded in July 1973 by Dr. Adlowe Larson, Professor of Agricultural Economics and member of the University of Wisconsin's Center for Cooperatives, whose term ended in June 1976.

### 3. Education Advisor

A Deputy Program Coordinator or Education Advisor was deemed advisable at UGM for several reasons. Chief of these was the recognition that the agriculture

faculties compose but one part of Gajah Mada University, and that proposals for changes in administration, course design and curriculum had to be made in the context of the University as a whole. A second reason was the slighter degree of contact UGM's agricultural faculties had experienced with American aid projects in the previous two decades, as compared with IPB. Third, there were fewer agricultural scientists at Gajah Mada with advanced degrees from other universities.

Due to difficulties in finding suitable housing, it was not until May 1971 that the first Deputy could be appointed in the person of Dr. Thomas King, a plant pathologist from the University of Minnesota. In 1973, Dr. Joseph Jakobs of the University of Illinois' Agronomy Department was named to the Deputy position. His two-year term ended in October 1975, and he was not replaced following his return to the United States. As at IPB, Indonesians increasingly assumed responsibility for daily operations of the Project at UGM. Administrative Assistant at the MUCIA Gajah Mada office until June 1976 was Mr. Williebrordus Koen, MUCIA operations at Gajah Mada were in the hands of local staff members.

Under the second phase program, the Program Coordinator position was revived, although the title was not used. Dr. Monte Juillerat, an agricultural economist from Indiana University, was based in the Jakarta office (the IPB and UGM offices had been closed) and completed duties primarily at IPB although he carried out a number of short assignments at UGM, at several regional institutions, and worked with the Agricultural Consortium.

## B. SHORT-TERM APPOINTMENTS

### 1. Short-term Experts

Highly qualified agricultural scientists were appointed for terms of approximately three months, divided equally between IPB and UGM, to assist Indonesian counterparts

in review and revision of teaching programs, in extension, and research. Collaboration between counterparts was to be ongoing, with the possibility of return visits by American staff, and joint research projects. The tour of duty was to be preceded by detailed preparation and contact between counterparts. Some funds from MUCIA were to be allocated to assist the programs of the short-termers, for instance in shipping classroom materials to Indonesia.

The first short-term expert began his appointment in November 1970. From then to December 1976, fifty-two short-termers held appointments at IPB and UGM. They worked with counterparts in the following disciplines:

Administration	1	Entomology	1
Agricultural Economics	2	Fisheries	1
Agricultural Engineering	5	Food Science	4
Agronomy	10	Forestry	6
Animal Science	7	Microbiology	1
Biochemistry	2	Pathology	1
Botany	2	Poultry Science	2
Dairy Science	2	Veterinary Science	<u>4</u>
Ecology	1	TOTAL	52

Six of the fifty-two short-term assignments were second appointments. Those making a second tour of duty were: Carl Baumann (Biochemistry), Herbert Bird (Poultry Science), Merle Esmay (Agricultural Engineering), Theodore Hedrick (Food Science), Neal First (Animal Science), and Edward Runge (Agronomy). Dr. Bird's two visits as a short-term consultant in Poultry Science were separated by a two-year appointment as Program Coordinator at IPB. Dr. Benjamin also served as a short-term consultant, following his term as Program Coordinator. One short-term advisor, Dr. Peter Tack, briefly revisited IPB and UGM under the Target of Opportunity program.

The listing above indicates the extent of MUCIA contacts with agriculture faculties and departments at the two peminas. In addition, many short-term advisors also paid brief visits to other Indonesian universities (most frequently to Hasanuddin, Udayana and Brawijaya), to research agencies, farms, and agricultural industries, in order to deepen their own knowledge of Indonesian agriculture. Other reasons for these additional visits were to demonstrate the field trip as a teaching tool, and to promote a key aspect of institution building, namely, establishment of links between the university, other educational institutions and agencies, agri-business and the community at large.

Each short-term visitor submitted a report to the Project Administrator upon completion of tour of duty. The reports were duplicated by the Project headquarters in Madison and distributed to MUCIA personnel, agencies of the United States and Indonesian governments, and to Indonesian universities. Drawn together in summary form, these reports were presented for discussion at the annual review in line with the Project's aim of frequent appraisal and evaluation.

Following upon recommendations of the first group of short-term experts, modifications were made to this aspect of the Project:

1. Short-term experts were assigned primarily to one peminas; and
2. The term of the visiting expert was set to serve the needs of the individual and of the host department, ranging in length from two to six months.

Topics common to the reports of the first group of short-term experts were: overall survey of a department's curriculum and supporting facilities such as library and laboratories; discussion of problems posed to research by lack of funds and unstable supplies of electricity and water; inadequate staff salaries and the consequent tendency of professors to spend much time in other paid employment; department and university organization; and aspects of the short-term advisor's program such as advance preparation, housing and provision of equipment.

Over the years the content of the Project advisor's reports changed considerably, indicating progress at IPB and UGM peminas in solving some of these problems. For instance, early remarks that contact with Indonesian counterparts prior to arrival in Indonesia was inadequate, if not non-existent, gave way to evidence that Indonesian professors gained confidence in defining explicit objectives of the visit and in planning detailed programs for the visitor. Similarly, problems having to do with housing for short-termers were resolved. A continuing obstacle was the delay in arrival of special equipment and texts ordered through the Project for use by the short-termer while in residence at IPB or UGM.

With the commitment of IPB and UGM to upgrading their agricultural faculties came tangible results. The following are examples: reliable supplies of electricity and water; centralization of laboratory equipment and provision for its supervision and maintenance; reorganization of campus libraries and extension of hours for student use; and new manuals for the classroom and laboratory.

Reports of later short-term experts tended to dwell, therefore, on such matters as further improvements in the new curricula drawn up with the assistance of earlier consultants, the role of the Project Advisor in research and in the examination of doctoral candidates in Indonesia, and participation in upgrading sessions offered by IPM and UGM for staff from provincial universities. These first-hand observations are marks of the progress and success of the MUCIA/Indonesia Project, as much as are statistics

on Indonesians studying in MUCIA universities, and numbers of books and chemical supplies purchased.

Now that the groundwork for progress had been laid through the short-term visitor program, it was envisioned that this aspect of the Project would be allowed to decline. The decline was greatly accelerated by insecure funding and the subsequent use of loan instead of grant funds. Few short-term appointments were to be made from MUCIA universities in the second five-year period. Rather, Indonesians who had graduated from American universities continued at the provincial universities the tasks of review and consultation that American short-termers first performed at IPB and UGM.

## 2. Targets of Opportunity

The idea of this program was to capitalize on the presence of American agricultural scientists travelling in Southeast Asia on other business. They were to be selected by Indonesian university administrators for brief visits of one to two weeks to departments at IPB and UGM for general review of programs and supporting facilities.

A total of twenty professors from four MUCIA universities made such brief visits under the Targets of Opportunity program to the faculties of Agriculture, Veterinary Medicine, Fisheries, Animal Husbandry, Forestry, Biology, and Agriculture Technology at IPB and UGM. One, Dr. Francis Busta, a specialist in Food Science, made two such visits. Two short-term advisors, Dr. P. L. Tack and Dr. A. B. Chapman, followed up assignments as short-term advisors with two-week visits as Targets of Opportunity to both IPB and UGM. Another Target visitor, Dr. Daniel M. Benjamin, subsequently returned as Program Coordinator to IPB. Targets of Opportunity also made reports of their activities and observations to the Project Administrator and their Indonesian counterparts.

### 3. American Graduate Students

In addition to plans for sending out experienced American scientists, the Project called for the selective use of American graduate students. They would be supported for approximately one year of research in Indonesian agriculture or related disciplines, affiliated with an Indonesian university and assisting senior students in such areas as design of research, study methods, gathering data and thesis preparation. No student accompanied a short-term advisor, but the Project supported the research in Indonesia of advanced doctoral candidates in fields such as urban migration and economics, horticulture, rural cooperatives and animal nutrition. The resulting dissertations were made available widely by the Project.

## C. INSTITUTION BUILDING

### 1. University Administration

Another goal of the Project was to assist IPB and UGM in reorganizing their administrations. This was to permit efficient and effective internal upgrading; further develop the peminas; make the best possible use of scarce resources; and to extend support to the provincial universities. These goals were to be reached by training Indonesians in university administration at American institutions, appointment of a short-term consultant specializing in financial administration, seminars in educational administration in Indonesia, and appointment to IPB and UGM of long-term personnel with experience in university administration. Other methods included review of faculties, departments, and science facilities by short-term experts, and provision of some funds for purchases aimed at assisting the process of institution building.

Indonesian university officials attended the University of Wisconsin's annual summer seminars in university administration. Participants included Indonesians already studying at MUCIA universities and several administrators from IPB and UGM brought

to the United States under short-term, non-degree training programs. In all, seventeen attended the seminars before the program was discontinued at the end of 1974.

Among the second group of short-term advisors sent to Indonesia was Dr. Hubert Hess, Assistant Vice-President for Financial Affairs at the University of Wisconsin. His program at IPB and UGM included many discussions on the organization of a university, preparation of budgets and financial forecasting, reorganization or administrative hierarchy with definition of competencies and responsibilities of officers at each level of the chain of command, centralization of such university services as equipment maintenance and storage unit, and inventory of equipment.

Methods of organizing universities were also the subject of a number of Project-sponsored workshops held for deans, heads of department and other university administrators in Indonesia. In addition, Dr. Robert Clodius was a guest speaker at many university meetings throughout Indonesia where administration was the main topic under consideration.

In the first five years of the Project, MUCIA long-term personnel were frequently consulted by Indonesian university officials on the following subjects: coordination of research projects between departments and faculties, and with other universities and research agencies; means for enabling students to complete their studies within the six-year Ir. program, and thus end the current situation where many spend years fulfilling requirements of the fifth and sixth levels; revision of curricula, methods of teaching, grading examinations; and internal organization of the university and division of responsibilities. These were among the chief problems as perceived by Indonesian administrators. Furthermore, at IPB there was a desire to reconsider the entire degree program with a view to recasting it according to an American model.

a. The Agricultural Institute at Bogor (IPB)

Project long and short-term consultants uniformly advocated the following institutional format and design for IPB:

1. Appointment of Institute administrators as directors for research, graduate studies, undergraduate studies and services;
2. Restructuring of academic studies towards a four-year Bachelor of Science degree and a two-year Master of Science, with the undergraduate program composed of two streams, a terminal, practical or business degree and a course of studies preparing candidates for graduate work;
3. Allocation of credit units to courses as an aid to designing well-balanced academic programs;
4. Permission for students to repeat only the subject(s) failed, while proceeding to studies at higher levels of subjects passed;
5. Greater coordination of teaching between departments and faculties, so that basic science courses would be taught jointly to all first and second year students, thus eliminating duplication of resources, equipment and energy, and standardizing basic science education;
6. Creation of study programs to meet the individual needs of students through introduction of elective courses in the later years of the B.S., and permitting transfer of credit for study in elective subjects in other departments and faculties;
7. Introduction of a requirement of regular, written reports from all staff members on research in progress, and of written research proposals for review by departmental and faculty committees before submission to the Research Director, in order to prevent fragmentation of efforts, duplication of studies, and to promote more inter-disciplinary and team research and contacts with researchers elsewhere; and

8. Centralization of Institute facilities.

These were the basic proposals made, both by the long-term personnel and, in more specific instances, by the short-termers. Project reports showed wide agreement on methods of academic administration across all disciplines and nature of appointment in Indonesia. As stated above, IPB administrators had been considering changes in many of these areas. The reforms following the first five years of contact with Project staff are summarized below.

The system of creating directorships with specific Institute-wide duties, responsible to the Rector, was adopted. Currently, IPB has five directors in charge of Administration, Undergraduate Instruction, Graduate Instruction, Research and Public Service, and the Library.

Several departments and faculties began experimenting with a new style for the academic program. In 1972, the first group of students was enrolled in a four-year course of study. Degree programs were redesigned and the content of individual courses reviewed and revised where necessary. Syllabi and printed outlines of lectures were prepared and in some cases laboratory manuals were written, often in conjunction with a short-term Project visitor. Professors were assigned the task of translating parts of texts or articles into Indonesian, so that the new courses would not only incorporate newer material, but have Indonesian language materials for students. A university catalogue of courses, listing programs and instructors, was issued for the first time in 1972. By 1976, all six faculties had begun experimenting with the four-year program, and a total of two hundred twenty-four courses had been revised, updated and reorganized. The first class for the new Bachelor of Science degree graduated in December 1976.

One of the major inputs of the project was the development of a credit system for coursework. Many of the MUCIA experts in all fields spent time working with counterparts to determine "how much classroom and outside work equals a credit." The

process of reorganizing current course materials to give balance to a credit system required tremendous effort on the part of MUCIA experts and Indonesian counterparts. As the system evolved, some old courses were divided into two separate courses, while others were combined into one larger course. The process required nevertheless that the Indonesian departments and faculties be satisfied that the proper balance of workload and course content was maintained. The experience of IPB in the area of credit course work subsequently became a national model for higher education.

At the same time a limited number of courses was offered at post-graduate level. Again, Project short-term experts were drawn upon for guest lectures and for assistance in devising curricula, while long-term Project staff spent many hours in consultation with IPB authorities on rules for the incipient graduate school, setting requirements and planning programs. In the 1975/76 academic year, Master of Science degree programs were inaugurated in the fields of Agronomy, Agricultural Economics, Applied Statistics, Poultry Science, Soil Science, Entomology, Agricultural Extension and Rural Sociology.

The process continued step by step, with plans for a complete IPB graduate school offering doctorates of internationally recognized standard starting in 1978. The Project's participation in this regard was threefold. First, three of the Indonesian staff sent to the United States for course work returned to Indonesia at Project expense to conduct thesis research. Second, some Project personnel, both long-and short-term, were appointed to academic committees for candidates taking higher degrees in Indonesia, after spending short intervals in the United States to take advanced courses not yet offered at IPB or to complete a review of scientific materials on their subject. Third, Project staff advised candidates in research design and methodology, and cooperated in such diverse ways as reviewing research proposals and having scientific samples analyzed in American laboratories.

Within the new Bachelor of Science program some IPB-wide courses in basic sciences were introduced, and electives were offered for senior students. The choice and range of electives were still quite limited, however, as compared to the programs of MUCIA agricultural colleges. The faculties of Animal Husbandry and Veterinary Science adopted B.S. programs that included a four-year terminal degree aimed at producing scientists for work with government agencies, agri-business and extension. Animal husbandry later also added a B.S. stressing basic sciences and statistics that is designed to prepare candidates for graduate studies. A six-year degree can be selected by veterinary science students hoping to pursue advanced studies in this field.

Centralization of facilities proceeded at IPB in many respects in the period under discussion, too. A Data Processing Unit was established in 1973 with funds from the Project to purchase computer parts and accessories. A Visual Aid Center now operates an inter-departmental loan system that works well. Individual short-term experts donated to their host departments taped lectures and sets of slides for classroom use, which are made available to other departments through the Center. In 1972, IPB opened a Maintenance and Repair Shop. As a result, existing equipment was checked and made operational where possible. The campus Print Shop was rehabilitated with major financial assistance from the Project in supplying machinery. It has responsibility for printing Institute manuals, catalogues, and texts at low costs for universities and high schools throughout the archipelago. Progress was slowed, however, by the damage in shipment to the new printer-composer and loss of several essential parts and accessories.

In general, then, IPB consistently remained "on target" in achieving the goals laid down in the original planning document, or often exceeded those goals.

b. Gajah Mada University

Problems—and solutions—were somewhat different at UGM, given that it was not an agricultural college alone. Rather, the agriculture faculties represented but one

grouping within a total university. Furthermore, these faculties, being of relatively recent date, did not have the advantages of Dutch-installed laboratories, or the many facilities located in and around Bogor, such as the botanical garden and research library. Strategy and consequences, accordingly, were different from those advanced by Project personnel for IPB.

Basically, Project staff supported UGM's decision to group together in one Agro-complex all faculties, from Veterinary Medicine to Forestry, having to do with the agricultural sciences. These were headed by a dean, responsible first to the director of the Agro-complex who was directly responsible to UGM's Rector. The Agro-complex was headed by a Coordinator, and was comprised of the faculties of Agriculture, Agricultural Technology, Animal Husbandry, Biology, Forestry and Veterinary Medicine. Under this format, problems common to all six faculties could be dealt with at an inter-faculty level, and steps could be taken which affect the group as a whole.

Unlike IPB, UGM preferred to review and upgrade its Insinyur (Ir.) program as a course of six years of study, with the last two being at the graduate level. Within this framework efforts were made to revise the curricula of particular courses, and to incorporate newer scientific material and the use of audio-visual aids, often with the assistance of Project short-term advisors. Later, the Agriculture Faculty, however, devised a four-year Bachelor of Science degree along the lines of IPB's undergraduate program. UGM also organized a number of upgrading courses, which were attended not only by advanced students and junior instructors of the University, but by staff from provincial universities as well. Short-term consultants participated in upgrading classes in the fields of Ecology, Genetics and Seed Technology.

Considerable effort was devoted to the problem of providing the Agro-complex with an agricultural experiment station, both on the part of UGM personnel and Project long-term staff. Land was purchased with the aid of the Rockefeller Foundation, and facilities were to be developed as additional funds became available. Suggested use

and design of the station were features of reports of several short- and long-term experts assigned to UGM.

Project staff reviewed department libraries and the main library and laboratories as part of their tour of duty, and made suggestions as to contents (books, equipment), as well as to methods of administration. As a result, the hours at Gajah Mada's main library were extended for greater convenience of the students, and more attention was paid to providing adequate lighting, seating space and shelving, and to the cataloguing of the library's holdings. For laboratories, several short-term appointees assisted in redesigning facilities for improved layout and overall condition, while others had a part in planning for the new buildings that UGM had recently erected, or intended constructing in the near future.

Early short-term visitors devoted considerable space in their reports to the Project Administrator on the problems posed to teaching and research, and to general preservation of specimens because of the inadequate and unpredictable power supplies. Provision of reliable utilities was of prime concern to UGM administrators also, and they were able to solve these problems through acquisition of generators. Consequently, new developments in teaching methods and in types of research were feasible at UGM.

Plans for extension of graduate studies at UGM proceeded according to a different timetable than at IPB. A major reason was the smaller number of staff with overseas degrees at the start of the MUCIA/Indonesia Project, as compared with IPB. Accordingly, priority was placed on upgrading staff members at UGM through enrolling them at MUCIA universities for the Master of Science degree. By the end of the period under review, twenty-five had returned to staff appointments at UGM with American Master of Science degrees and another four had successfully completed doctoral studies. An obstacle to speedy achievement of this goal of upgrading staff through overseas training was insufficient English language skills. In cooperation with UGM, the Project sought

to remedy the situation in several ways, including provision of language texts and tapes, and informal conversation groups run by the spouses of Project personnel.

Progress was made at UGM in centralizing services. Examples are the opening of a repair shop for the Agro-complex and improvements in record keeping for supplies and maintenance. The Project again supplied materials for an audio-visual center for use as teaching aids, and for the wider outreach programs that the agriculture faculties of UGM were to provide to farmers and small businesses in the region.

## 2. Staff Upgrading

An integral part of the institution-building process was to increase the numbers of Indonesian staff with post-graduate degrees and other special training through participant training in U.S. universities, and through programs at IPB and UGM. Candidates were to be selected mainly from the two peminas, although some staff members from provincial universities were also accepted from the participant training program in Indonesia and abroad. The professional self-improvement of Indonesian university staff was to be enhanced through instituting academic meetings, publications and through stimulating greater contact generally between universities.

### a. Participant Training

The first of the participants in the overseas training program arrived in the United States in July 1970. At that time, eighteen Indonesians then studying agricultural sciences in the United States under a variety of programs were transferred to this Project. All told, two hundred two Indonesian agricultural specialists were sponsored by the Project over the period July 1, 1970, to December 31, 1976. Of these, one hundred fifty-six were enrolled for studies leading to a Master of Science or a Ph.D., while the remaining forty-six were brought to the United States for periods of approximately three months to attend special seminars, visit research stations and

agricultural industries, and for general academic observation. Seventeen of the forty-six were participants in the University of Wisconsin's Seminar for Administrators.

Degree candidates represented a broad range of disciplines in the agricultural sciences. The major clusters of students were in the fields of Agronomy, Veterinary Sciences and Forestry, with enrollments of nineteen, eighteen, and seventeen respectively. Other disciplines with heavy enrollments were Life Sciences (15), Agricultural Economics (10), Animal Science (10) and Food Science (10). In smaller numbers, Indonesian staff enrolled in Agricultural Engineering (6), Statistics (6), Fisheries (4), Horticulture (4), Entomology (3), Poultry Science (3), Biochemistry (2) and Dairy Science (2). There were also enrollments in Marine Science, Meteorology, Pharmacology, Library Science, Communications, Agrarian Law and Agricultural Extension Education.

In the period July 1970 to December 1976, the following number of participants returned to their home universities with degrees:

<u>IPB</u>			<u>UGM</u>		<u>Other Universities</u>			<u>Total</u>
MS	PhD	MS & PhD	MS	MS & PhD	MS	PhD	MS & PhD	
16	16	4	25	4	3	3	1	
36			29		7			<u>72</u>

Participants in the overseas training programs, who returned to Indonesia, made substantial contributions to their home university and to Indonesian agriculture generally. This was equally true of those returning with degrees as it was of those whose period of study in the United States was briefer. For example, returned participants were appointed to oversee departments, assume the responsibilities as deans and directors, run all-campus facilities such as the library, and take charge of laboratories. All participants in the overseas training program injected new ideas and enthusiasm into their home departments, and proved valuable as teachers, both in terms of content and

methods of teaching, as well as of organization of courses and programs, in the judgment of project short- and long-term staff. Returning participants contributed to the range of printed material available to colleagues and students by bringing back text books and other classroom materials, in addition to their research and laboratory notes. In the United States, they mixed extensively with Americans and Indonesians of various university backgrounds and were exposed to new ideas and approaches.

With such background and additional experience, the returning participants took over many of the tasks and responsibilities of the Project short-term consultants in relation to regional universities. Thus, the Project became self-perpetuating through the training and new skills given Indonesian personnel of the pembina universities.

Returned participants also made contributions to Indonesia's agriculture as consultants and researchers for Indonesian government agencies and private firms. In applying their new expertise, they passed on knowledge to Indonesian farmers and agricultural entrepreneurs and so participated in the national goal of raising living standards.

The original plans called for placement of some staff members in other universities in Southeast Asia. Little was accomplished in this aspect of the Project in its first five years, although it was envisioned that such enrollments would increase in the second phase. Several staff visited such regional institutes as the International Rice Research Institute (IRRI) at Los Banos, and one IPB staff member attended a seminar in university administration at the Asian Institute of Technology (AIT) in Bangkok, at Project expense. Another took a Master of Science degree at the AIT. Outside the Southeast Asia region, one Indonesian participant was sent to a conference in Puerto Rico, and another attended an international conference of veterinary scientists in France.

b. Pembina Programs

Staff upgrading was also accomplished by special programs conducted on campuses in Indonesia. In accordance with the principles outlined in Document X, most Project aid was centered directly on the two pembina universities in the expectation that benefits would filter from them out to the regional universities. Consequently, the Project cooperated in running upgrading seminars at IPB and UGM, both through contributing funds for teaching materials and staff for assistance in preparing courses and, in some cases, teaching them. Examples of upgrading seminars in which Project staff participated as lecturers are Soil and Water Engineering at IPB, and Food Chemistry, Agricultural Mechanization, Seed Technology, Genetics, and Research Methodology and Data Analysis at UGM. Class members included local staff and senior students and personnel from other Indonesian colleges. Advantages to this method of staff improvement as compared to overseas training may be summarized as follows:

- a. University staff were absent from their institutions for shorter periods of time;
- b. Costs were lower, and therefore greater numbers were reached;
- c. Classes were conducted mainly in Indonesian, so the impact was greatest, and those not yet fluent in English were not excluded from the opportunity for self-improvement;
- d. The host university derived lasting benefits from upgrading seminars in the form of new laboratories and classroom materials;
- e. Participants had an opportunity to meet colleagues from many Indonesian universities to broaden horizons and form bonds likely to be advantageous in future academic work; and
- f. The stature of IPB and UGM was enhanced in carrying out assigned duties to fellow universities and the nation.

As time went on, the concept of pembina (leader institutions) acquired a negative connotation among the academic community in Indonesia. Consequently, while many of the pembina functions continued, and still continue today at IPB and UGM, the term itself was discarded by the mid-point of the Project.

c. IPB Doctorate

The development of a graduate school at IPB had been discussed in connection with institutional upgrading and with activities of Project long- and short-term staff. Advantages expected from establishing an IPB doctorate included: building up the reputation of IPB as an agricultural university, both in Indonesia and internationally, cheaper studies, a avoidance of difficult readjustment problems faced by graduate returning from overseas, greater adaptation of research to Indonesian needs and to conditions at Indonesian universities, and development of a body of scientific writing in the Indonesian language.

d. Professional Contacts

In addition to programs of local and overseas studies, self-improvement of university staff depends upon the degree of professional contact between departments, faculties, universities, and other institutes and agencies. Project staff frequently addressed the problem of isolation of the Indonesian scientist, especially since universities tended to be staffed almost wholly by their own graduates. Returned participants also noted that professional isolation was one of the greatest problems they experienced. MUCIA advisors therefore urged MUCIA and Indonesian university administrators to allocate funds to support regular professional meetings of such proposed bodies as an Indonesian Foresters' Association or an Association of Veterinary Scientists. Funds were needed for transport and for costs of publishing and distributing conference papers. Some Project staff recommended allocation of funds to enable Indonesians to attend

scientific meetings in their specialty in the Southeast Asia region. A more modest proposal was provision of postage so that scientists might maintain contact with colleagues overseas. Other suggestions to facilitate professional contact included establishing regular bulletins of research notes which would list investigations underway and results of experiments, as a service to the Indonesian scientific community, and information pamphlets for business people and farmers explaining new techniques and products.

Little was achieved along these lines. Project staff noted reluctance on the part of Indonesian colleagues to publish results of their research, although the problem was also one of financing. Research notes in mimeo form were circulated by some departments, and an agricultural engineering journal, Mekanisasi Pertanian, is now being published by IPB's Agricultural Engineering Department. Furthermore, since the inception of the Project there were several meetings between scientists from the two pembinas, enabling more rational planning of research. Contacts with provincial universities were stimulated by the upgrading courses at IPB and UGM. To be noted here, too, is the contact initiated as a result of pembina staff accompanying Project appointees on visits to the provincial universities.

A more successful aspect of professional contacts came through the growth of the agricultural consortium (KIP) which became one of the most active of the academic consortia in Indonesia with assistance from this project. Much of the project commodity planning, especially for regional institutions was handled by KIP using Indonesian staff, most of whom had been trained under the project. These Indonesian experts were sent to the regional universities to work with faculty members there in planning equipment orders.

Another major way that academic contact was facilitated through KIP as well as the project was the joint annual review program. Increasingly the program of these reviews was taken over by KIP with major inputs from UGM and IPB as well as MUCIA.

In later years, representatives from the regional universities participated as well. It is significant that as KIP and the Indonesian universities took an increasingly larger role in these reviews, the primary language shifted from English to Bahasa Indonesia to better insure the professional interaction of the Indonesian groups. During the last several annual review programs, most of MUCIA's inputs were delivered in Bahasa Indonesia as well.

D. COMMODITIES

To assist the development of the academic program, funds were to be allocated by the Project to IPB and UGM for equipment and books, according to priorities set by Indonesian deans. Commodity purchases were also made for several regional universities. Project funds were to decline gradually from initial heavy expenditures as replacement funds became available from the Indonesian government for commodity purchases.

Contrary to plan, amounts allocated by the Project for purchase of text books, laboratory supplies, journals and other equipment, not only rose steadily in the first years of the Project but reached a peak in fiscal year 1973-1974. Items purchased included office equipment, calculators, laboratory instruments and supplies, subscriptions of journals, and gifts of books and of back issues of journals. The following year, 1974-1975 as grant funds were depleted, saw a sharp drop in MUCIA spending on commodities. There was not, however, a corresponding increase in funds from the government and reflected in budgets.

This aspect of the Project was always one of the most difficult to execute. At first there were long delays in the placement of orders by Indonesian departments. Arrival of sea shipments and release of goods by customs officers was also more time-consuming than expected. Early on, considerable damage to goods and losses occurred. As a result, the enthusiasm of IPB and UGM staff for research projects sometimes

decreased when necessary equipment was not available, or when essential parts were missing from shipments.

In order to avoid some of the problems listed above, a number of measures were taken. Better methods of obtaining lists of priority items from the peminas were devised, including setting final dates for placement of orders. The Jakarta office created a flow system as a means of keeping track of all stages in sending items from the United States to their destination in Indonesia. Such streamlining in overseeing shipments expedited delivery of goods and solved some problems, but it was not able to deal with problems associated with shipping itself, or with warehouse loss and customs procedures.

Much of the commodity program in Indonesia -- the initial planning and organizing of commodity orders and, subsequent to their arrival, the port clearances and distribution to universities -- was handled by the Agricultural Consortium with assistance from MUCIA. As with any new area of responsibility, there was some lost motion in developing the program through KIP. (It obviously would have been faster and easier, for example, if AID had handled all the customs and other clearance procedures.) However, ultimately the Agricultural Consortium and universities were successful in getting most of the commodities in place. Where support seemed most critically lacking even through the end of the project was 1) university budget funds were not available to continue equipment purchases or even for parts and repairs; 2) there was no mechanism to provide expertise for training faculty members to assemble or operate equipment, although this would have been an ideal task for one or more short-term experts; 3) the planning for commodities, particularly at regional institutions, was not thorough in that back-up needs such as high voltage electricity or constant air conditioning were not available; and 4) the time-lag from placement of the order to delivery of the equipment was very long because of the disjointed nature of the project management for commodities.

E. EVALUATION DURING THE PROJECT

Frequent, regular evaluations of the Project were to be made to test method and approach, and to insure flexibility and adaptability. Evaluations were to be made by knowledgeable outsiders, as well as through internal review. Further, MUCIA undertook a major survey of returned participants at the close of the project to determine the ways in which their training impacted on their careers and to ascertain their problems in completing the program of study.

This was operationalized primarily through individual and the joint annual project reviews. Returning American staff, both short- and long-term had to address a written report to the Project Administrator. Eighty were published and circulated widely. Recipients included MUCIA personnel, AID officials and university staff with MUCIA/Indonesia appointments. In Indonesia, copies were sent to the counterparts, Indonesian university administrators, and to members of the Indonesian Agricultural Science Consortium. A summary of the reports was made annually and distributed widely. Recommendations from Project consultants were presented for discussion to the general review meeting held each year.

The annual project review, instituted in response to the proposal for outside evaluation, was held in Indonesia and run by members of the Consortium and peminas. Those attending included members of the Consortium and representatives of Indonesian ministries and of IPB and UGM, as well as long-term Project staff, local AID officials, MUCIA Board representatives and staff from AID-Washington. Special guests and observers included representatives of the Rockefeller and Ford Foundations, the Australian Vice-Chancellors' Committee, and of agencies with research interests in Indonesian agriculture. The reviews covered three days of general meetings, panel sessions and workshops, which surveyed progress during the past year and made plans, in light of such review, for the future. The first meeting was held at Jakarta in January 1971. The meeting reviewing the first five years of the Project was held in

Bogor in March 1976. These problems seemed to be almost generic; that is, they were with the Project throughout its entire span and while remedial actions were taken, the problems remained, although at a lower level. There were other problems that were critical early in the project but were much less so later. These included (5) short-term experts; (6) participant placement; and (7) texts and curricula. Each of the problem areas are reviewed below.

From reports of Project staff, it was evident that some problems hampered realization of certain aspects of the Project. These can be labeled under the general headings of (1) background preparation for participants in overseas training; (2) inadequate funds; (3) differences between IPB and UGM; and (4) commodities. The annual review process may have been somewhat cumbersome with as many as sixty people participating, but these reviews were increasingly controlled by the Indonesian groups and offered them a formal setting in which to review activities of the past year and plan for the next. Very few technical assistance projects have offered greater opportunity for local professional inputs to a project of this magnitude.

1. Preparation for Participants in Overseas Training

Most American universities require a minimum score of five hundred on the Test of English as a Foreign Language (TOEFL) before admitting foreign students to advanced study. Failure to reach five hundred seriously slowed sending staff for overseas study, according to schedule. In many cases prospective candidates were able to take the test successfully after further language studies. However, most candidates had very full workloads, with little time off for extra language preparation. Several staff members, provisionally accepted into American graduate schools, were unable to take advantage of the possibility.

From time to time suggestions were made that the entrance tests should be less rigid, and on occasion students with scores of 498 were accepted as overseas participants

by special waiver. At the time, however, it was thought inadvisable to persist in admitting borderline cases. Most candidates who obtained TOEFL scores above 500 still experienced language problems in their first year of study in the United States, with attendant consequences on their overall academic performance. As results of the MUCIA evaluation showed, however, the TOEFL score did not turn out to be as significant a predictor for student success as did past grades and the presence of the student's family.

This problem of meeting the five-hundred mark was particularly acute for UGM applicants. At IPB, by contrast, there was already a group of lecturers with M.S. degrees from American universities as a result of the ten-year contract between the Institute and the University of Kentucky. Consequently, there was a pool of scientists already well versed in English from which to draw candidates for overseas study. Lacking such an established group, UGM had to select candidates without prior experience in an English language environment. As a result, UGM was not always able to meet its quota for overseas training, whereas IPB was able, on occasion, to exceed it.

A related problem is that of overall scientific preparation. Candidates from both peminas experienced difficulty in studies because of insufficient background in advanced mathematics, physics, biochemistry and statistics. Consequently, some took senior level B.S. courses in the basic sciences before proceeding to graduate studies. Again, this necessitated delay in completion of the Master's degree, and kept vitally needed staff away from their home universities, but without such prerequisite training the ultimate success of the participant would have been in serious jeopardy.

## 2. Shortage of Funds

Lack of sufficient funds is a perennial problem for all institutions of higher education. At UGM the problem was unusually severe, hampering speedy development in getting research projects underway. Lack of laboratories and of buildings designed

specifically for scientific work, lack of an experimental farm and other facilities, until recently, limited the types of research possible and frustrated staff members, while depriving the greater community of the results of investigations. The limited sums available for library acquisitions also adversely affected scientists and students. First, the habit of wide reading is not easily developed in students. Second, staff without access to journals are often unaware of research being done in other countries that might have application and relevance to Indonesian problems.

### 3. Differences between IPB and UGM

Differences between the two peminas caused some difficulties for the purposes of the Project. These were due to the nature of the institutions. IPB is composed of six faculties of agricultural sciences, whereas Gajah Mada is a full university. Other factors already mentioned included the better facilities for research at IPB, which promoted swifter progress in achieving some of the Project's goals. As a result, program schedules for Project goals had to be reworked in recognition of these differences and new policies evolved to meet different needs and circumstances. Goals of numbers of staff trained in the United States, for instance, were not met from Gajah Mada. Nor, given the difference between the first degree programs, can the two institutions be judged by the same criteria. With the decision of IPB to move towards an academic system of Bachelor of Science (four years), Master of Science (2 years) and Ph.D., came a gap in goals, progress and achievements. Efforts at UGM concentrated on perfecting the Insinyur degree (six years).

### 4. Commodities

As mentioned earlier, some difficulties in the smooth running of this aspect of the Project were beyond the control of Project personnel or the peminas. These included shipping conditions and losses through theft, or damage to goods while in

transit. Items sent were selected specifically to complement programs instituted through the Project. Some staff, therefore, were disappointed as needed equipment and supplies did not arrive in time for their projects. In some cases a project was not completed or even undertaken.

In very broad terms, a number of areas raised repeatedly as problems by the first round of Project staff had been solved, at least partially, by the end of the first five years of the Project. These will be discussed below.

#### 5. Short-term Experts

This component of the Project showed considerable advance over the years in terms of preparation and contact, reception of short-term visitors and conditions for them. By the reports of the second and third group of short-term experts, these matters had disappeared from discussion completely, suggesting that there was no longer cause for analysis and that few difficulties still remained. The resolution of these problems indicated greater experience on both sides, that is, in terms of confidence within Indonesian departments, and the greater contact between returned and prospective short-term consultants. The Project's Madison office organized several meetings which drew together returned consultants as well as those about to take up assignments. At these seminars the nature of tasks in Indonesia, as well as problems in Indonesian agriculture and details of Indonesian agricultural facilities were discussed.

#### 6. Enrollments

Over the first five years, the Madison office speeded up the process of enrolling Indonesians in American universities. In the first year of the Project, candidates were frequently refused admission by universities (including MUCIA member institutions) several times, resulting in delays in their placement and in meeting Project quotas for their home university on schedule. Greater familiarity with Indonesian students and

confidence in their abilities facilitated evaluation and recommendation considerably. Further, it is clear that individual applicants themselves and their home universities were better able to deal with admission forms, supplying transcripts and other information, and that the ability to select candidates had been well developed.

#### 7. Texts and Curricula

A major obstacle to raising standards for degrees, encouraging development of private study habits in undergraduates, and to speeding up completion of degrees was the lack of texts in the Indonesian language on each subject. Over the years textbooks and articles were translated into Indonesian, thereby assisting students and building up the body of scientific literature in Indonesian. Furthermore, translation contributed to the development of recognized and accepted scientific terms in Bahasa Indonesia.

The results of changes in curricula, teaching methods and in grading were also apparent by the end of the five-year period, as were results of greater streamlining of university administration. Course catalogues and greater availability of information, generally, increased the options open to students, and contributed to a sense of belonging to the university as a whole, rather than to an almost autonomous faculty. The esprit de corps of the institution was thereby strengthened.

#### F. EVALUATION (POST) OF PARTICIPANT TRAINING

The extended period of time over which this project operated provided an excellent opportunity to evaluate the results of the participant training program because many of the participants had returned to their home institutions for sufficient time to apply their newly acquired skills and to make candid judgements about the utility of much of their training experience. An extensive survey instrument was designed and sent to more than one hundred of these returned participants.

The results of this survey are summarized in Appendix B of this final report.

#### IV. PROJECT ACHIEVEMENTS IN PHASE TWO: 1977-1983

This project had been designed with a ten-year time frame, but funding was initially provided for only five years. Before the second phase funding was made available, the global rise in oil prices dramatically altered Indonesia's financial position and as a consequence the willingness of the U.S. government to provide grants to Indonesia for development projects diminished. For a period of time, it was uncertain whether the second phase would be funded at all, and when funding was made available, it was in the form of a loan rather than the initially anticipated grant. Both the uncertainty of second-phase funding and the use of a loan mechanism had important and not generally positive impacts on the subsequent activities of the project.

The second five-year phase of the MUCIA/Indonesia Higher Agricultural Education Project, financed by a USAID loan to the Government of Indonesia, expected to complete the objectives of the first. The focus of the second phase shifted almost entirely to participant training. Indonesian staff were sent to the United States for advanced study, so that all departments of agricultural sciences in the peminas would have a core of overseas trained professors. Smaller but continuing contributions were made to building up the resources of libraries and laboratories, and there were continued appointments for a long-term American Project Director in the MUCIA/Jakarta office. In addition, a two-year staff position was created for an American advisor to work with IPB in long range planning, further development of credit program at the undergraduate level, preparation for additional graduate courses, and development of a plan for public service activities. Short-term consultants, however, were largely replaced by returned Indonesian participants from degree programs abroad, as plans for phase two envisioned. These newly returned staff periodically visited the provincial universities to promote their upgrading, much as the MUCIA short-termers had done in the first phase. Cooperation in research between the peminas and MUCIA schools was maintained through funds set aside for the purpose. The gratifying bonds of mutual cooperation

between Indonesian and American universities continued, with beneficial results for all participants.

The second phase of this project was, in fact, an extension of the original MUCIA/AID agreement known as Amendment 15. While the general goals remained the same as under Phase I, and will be outlined below, a significant change was the 75 percent reduction in man-months allocated for technical assistance. Long-term consultation was also curtailed, and the Agricultural Consortium (KIP) played a more significant role in the development of project programs. A detailed accounting of short and long-termers appears in Appendix A of this report, and the strong emphasis on participant training during this phase is also reflected in these tables. General results in the various areas of focus during phase two were as follows:

A. PUBLIC SERVICE

Programs to support formal and non-formal agricultural education were developed further. A particular emphasis was placed on channeling university resources to the problems of the rural community. Working with the Ministry of Agriculture, local governments, and public and private agribusiness firms, efforts were made in the following areas: informal education through university open door policies, satellite and radio instruction, family nutrition programs, farm field days, regional and community development projects, and training programs for military personnel, extension staff, and transmigrants. IPB successfully implemented a program where each student spent time working in a village (KKN program). This program, while producing its own "culture shock" for some students, was extremely valuable for bringing the students into the real agricultural world, as few of them were from rural backgrounds, and it also gave IPB excellent experience in administering a major public service program.

B. NATIONAL RESEARCH PROJECTS

Efforts continued to establish the capability to conduct effective research in support of public service activities. Progress was made in the development of new agricultural lands outside of Java, especially on Sumatra and Kalimantan. The transmigration program was emphasized. There was also a continuing interest in discovering and implementing ways to make better use of existing agricultural lands.

C. UNDERGRADUATE INSTRUCTION

During Phase I, significant progress had been made in the development and implementation of new undergraduate programs at IPB and UGM. During Phase II, efforts were made to extend these new courses of study to all Indonesian universities. Progress toward the development of a credit system for registering course work was more advanced at IPB than at UGM, but both programs were ahead of most other academic faculties. When the Ministry of Education mandated the credit system for undergraduate training as national policy, IPB and the Agro-complex at UGM became leaders in assisting other institutions with the development of a credit system.

D. GRADUATE INSTRUCTION

Again, good progress was made in Phase II. At IPB, M.S. courses were set in motion in 1976, and an in-course Doctorate begun in 1978. At UGM, upgrading of graduate instruction proceeded on schedule. At other universities, while development of graduate degree programs was well behind that at IPB and UGM, some M.S. programs were begun, and several other universities were in the process of developing doctoral programs. Plans were to establish a full in-course doctorate program by the end of the project, which eventually did result.

E. ADMINISTRATION AND GENERAL SERVICES

Efforts were continued to create effective administrative systems for all universities. While progress was made at IPB and somewhat less at UGM, the problem of faculty autonomy remains an important factor in limiting the effectiveness and efficiency of Indonesia's universities. Student services remain very weak at most of the Indonesian universities.

F. STAFF TRAINING

High priority was assigned to the implementation of a non-degree program to help keep agricultural professionals up to date. Such programs had already been given on an incidental basis at IPB and UGM. Permanent, regularly available non-degree programs were now established. In an attempt to make better use of short-termers, their visits were planned more carefully so that they could participate in the staff upgrading programs, thus helping to strengthen teaching. Significant numbers of advanced degree candidates continued to go overseas, chiefly to the United States, for part or all of their degree programs.

G. PARTICIPANT TRAINING

During phase two of the MUCIA/Indonesia Higher Agricultural Education Project, many of the institution-building aspects of the project were dropped in favor of participant training. There was a certain degree of nationalist sentiment among Indonesians which argued that technical assistance was too expensive, when compared dollar-for-dollar with training. And further, there was a general feeling that technical advice was no longer as critical as it had once been. Given the fact that the MUCIA project alone provided more than two hundred Indonesians with advanced-degree training and that by the midpoint of this project many of these individuals had returned to Indonesia, the decision to focus on further participant training seemed appropriate.

#### H. OTHER PROGRAM ASPECTS

Such intangibles as "spirit" are difficult to measure. Reports of later short-term consultants, especially those on their second appointment, speak of a sense of progress in the air at IPB and UGM, of continuing enthusiasm, greater optimism and resolve to overcome difficulties. Project staff felt that prospects for solving problems in Indonesian agriculture, and of thereby contributing to the national welfare were greatly brightened.

On the American side, there was now a pool of professionals in agricultural colleges with firsthand experience and observation of tropical agriculture, and a vivid grasp of some problems facing third world countries. Such experience was reflected in courses, with addition of new information on agriculture under different climatic conditions, for instance, and in the role of the returned consultants as major professors, advising and guiding Indonesians then studying in the United States. A personal knowledge of the background of Indonesian students, and of their special problems made the task of advising easier, and helped to foster a more personal bond between American and Indonesian scientists.

There was, however, a significant loss of Project momentum during 1976 when it appeared that phase two funding would not be available. The uncertainty extending over more than eighteen months made planning nearly impossible and broke the program continuity particularly for technical assistance. The funding problems were both unanticipated and unavoidable but had a very negative impact on the Project.

## V. CONCLUSION

The Higher Agricultural Education Project represented a major long-term commitment to building institutional capacity in Indonesia. During the more than fifteen years from the time the first needs assessments were made to the training of the last participant, enormous changes occurred in Indonesia. After fifteen years of political consolidation, hard-headed economic planning, the windfalls of a ten-fold increase in the price of oil, and substantial development assistance, Indonesia had moved into the ranks of middle income countries (albeit on one of the lower rungs of that range) and had a clear sense of direction for the decade of the 1980s. It had demonstrated that even facing the economic downturn of the industrialized nations in the early '80s, it could respond in a disciplined and timely manner to the hiatus in, if not the end of, the oil boom.

Indeed, it was clear that these "external" factors were significant in shaping the ultimate course of the Higher Agricultural Education Project. The initial plans envisioned a grant lasting at least a decade, as was warranted by the condition of the Indonesian economy at the time the initial needs assessment was made in 1968. Mid-way through the first five years of the grant, however, the dramatic changes in the world economy brought about by the OPEC oil embargo and rapidly escalating oil prices began to be felt. It became clear that while Indonesian institutional needs were as great as ever, the country's capacity to pay for institutional development was significantly enhanced. It was on this basis, among others, that the Higher Agricultural Education Project was continued as a loan rather than a grant for its second and final five years. There was a resulting loss in Project momentum, but the ultimate affects of this change in status were largely felt in the degree and pace at which the administrative and technical assistance portions of the project were indigenized--whatever the intended outcome of this change of status.

From the outset, one of the chief aims of the MUCIA/Indonesia Project was to assist Indonesian universities in preparing staff members for administration. As a result, the project was sensitive to the need to replace expatriate administrators of the project at the university level with members of the local staffs. The American long-term appointee as Program Coordinator at IPB was replaced by a member of the IPB staff in April 1975, with the American assuming a consulting role. By 1976, concurrent with the end of term for the American Program Coordinator at UGM, that position was also indigenized. Subsequent short and long term technical experts continued to consult with the Indonesian coordinators of the project, but the capacity for indigenous administration had been created in Phase I.

The same can be said to a somewhat lesser degree for the short-term technical assistance component of the project. By 1976, short-term experts were being replaced by returning Indonesians who had been sent abroad under the participating training portion of the project, except for a few fields. Over the course of the next five years, these returning Indonesians took up the tasks of review and consultation at the provincial universities that had been performed by the expatriate short-termers at IPB and UGM. Not only had the capacity at the pembina institutions been strengthened, but they had quickly taken up their responsibilities to develop the regional universities through offering in-country degrees and non-degree "upgrading" programs in expanded quantities. While there is no doubt that some problems arose as the demands on the time of the returning faculty became increasingly heavy, this was perhaps off-set by their ability to assess more quickly the needs of their own universities and the organizational context through which to respond to them.

Highly significant achievements were attained in institution building at both IPB and UGM, though at a different pace in each of the two because of the differing structure of the institutions and the previous development of their agricultural faculties. IPB, as a solely agricultural institution with a history of institutional support predating

the Indonesian Revolution and technical assistance through the University of Kentucky beginning in 1957, had a strong foundation upon which to build in the 70s. Throughout the MUCIA program of assistance, IPB made great progress toward achieving the project's objectives, planning, and new organizational procedures. Moreover, the intangible but critical factor of esprit de corps was exceptionally high among the faculty and administrative staff. Reports of short and long-term technical experts consistently stressed that IPB was "on target" in achieving or exceeding the goals originally laid down in the document. By the end of the Higher Agricultural Education Project, IPB had reached a "critical mass" of highly trained faculty in the estimation of many expatriate specialists. This did not mean that new questions of second generational problems would not emerge as heavy demands were placed upon the faculty and administration at IPB. It did mean that the support of the 1950s, 60s and 70s had been a success about which Indonesians and Americans alike could feel proud.

The problems and solutions were somewhat different at UGM given that it was not an agricultural college alone, but rather a total university in the process of developing other programs as well. The faculties of the Agro-complex had not had the advantages of Dutch-installed laboratories or other facilities dating to that period such as the extraordinary botanical garden at Bogor and the important research library. Basically, the MUCIA project staff worked to assist the implementation of UGM's decision to consolidate into one Agro-complex all faculties from Veterinary Medicine to Forestry having to do with the agricultural sciences. Under that format, headed by a dean, problems common to all of the six faculties were approached on an inter-faculty level, where steps were taken to affect the group as a whole.

While IPB had moved to develop a new system of B.S., M.S., and Ph.D. programs similar to those given at American universities, UGM preferred to review and upgrade the Continental system it was using for six-year "insinyur" degrees. The Agricultural Faculty did devise a four-year B.S. program to respond to the needs to produce well-

trained extension workers in a minimum of time. This program took on added significance when under the administration of the Minister of Education and Culture, Daud Jusuf, the Continental system of degrees was replaced by a system similar to the American on a nation-wide basis.

During the decade of MUCIA involvement at Gajah Mada, the university was able to overcome the initial problems of simply providing reliable utilities and sufficient supplies to support teaching and research and move on to new stages in methods of teaching and types of research. Through the first phase of the project, participant training was impeded to some degree by insufficient numbers of staff members with competency in English, creating a situation where more fellowships were available than candidates immediately available to make use of them. This problem, while never fully overcome, was eased by the creation of a language center where prospective candidates for study abroad could study English intensively. It is encouraging to note that in 1984 Gajah Mada University is in a much stronger position to respond to fellowship opportunities that it was a decade ago, while the provincial universities just now receiving attention from funding agencies are experiencing the difficulties not long ago seen at UGM. The problem of English language preparation has not gone away, but neither is it as insurmountable a problem as it may once have seemed.

The participant training aspect of the project has been a notable success, one that has encouraged the Government of Indonesia to increase dramatically its commitment to the development of human resources through training in the forthcoming five year plan. Returned participants have made substantial contributions to their home universities through improved teaching and research, overseeing departments, assuming deanships and directorships, and running campus-wide facilities such as libraries and laboratories. These participants have injected new ideas and enthusiasm into their home departments, have encouraged innovation in curriculum, course content, and teaching methods, and have widened the range of materials available in English and

Bahasa Indonesian. They have also developed an extensive network of collegial contacts with their former professors and fellow graduate students in the United States and elsewhere.

Perhaps even more impressive is the degree of involvement or linkage that returned participants have established with provincial universities and government agencies. There is no other academic field in which this has happened to such an extent in Indonesia as in agriculture. As a consequence, cooperation between agricultural faculties and the ministries of agriculture and public works has advanced markedly in the past few years. The involvement of university professors in applied research, project design and implementation is a direct consequence of their improved capacity to provide reliable data and well-considered recommendations to policy makers and implementors. Returned participants either directly or indirectly have helped to create in the Ministry of Agriculture the largest body of qualified researchers in any Indonesian ministry.

In reflecting on the successes of the Higher Agricultural Education Project, one should not neglect the substantial beneficial affects that the Project has had on the MUCIA member universities and other universities that provided either participant training or technical assistance. During the tenure of the Project, the University of Wisconsin, the lead university in the project, expanded its course offerings on Indonesia generally and course content on tropical agricultural more specifically. The University of Wisconsin now has a federally funded Center for Southeast Asian Studies which spans all disciplines and in which Indonesia receives special focus. The Center and cooperating university departments have produced a growing number of specialists on Indonesia, many of whom have greatly benefitted from their contact with Indonesians studying on their campuses. These contacts have promoted the development of linkages between American and Indonesian scholars that have facilitated an on-going exchange of information, expertise, and mutual cultural understanding. Among other MUCIA

universities, Michigan State and Illinois, both of which had numerous faculty involved as consultants and participant advisors, experienced a marked strengthening of program and course content focusing on Indonesia. One example of this was the Illinois proposal submitted for AID's Eastern Islands University development project. While the proposal was not successful, it was a very sound document. This is an indication of an indirect benefit for both USAID and Indonesia of the growth in American institutions through the MUCIA/Indonesian Higher Agricultural Education Project.

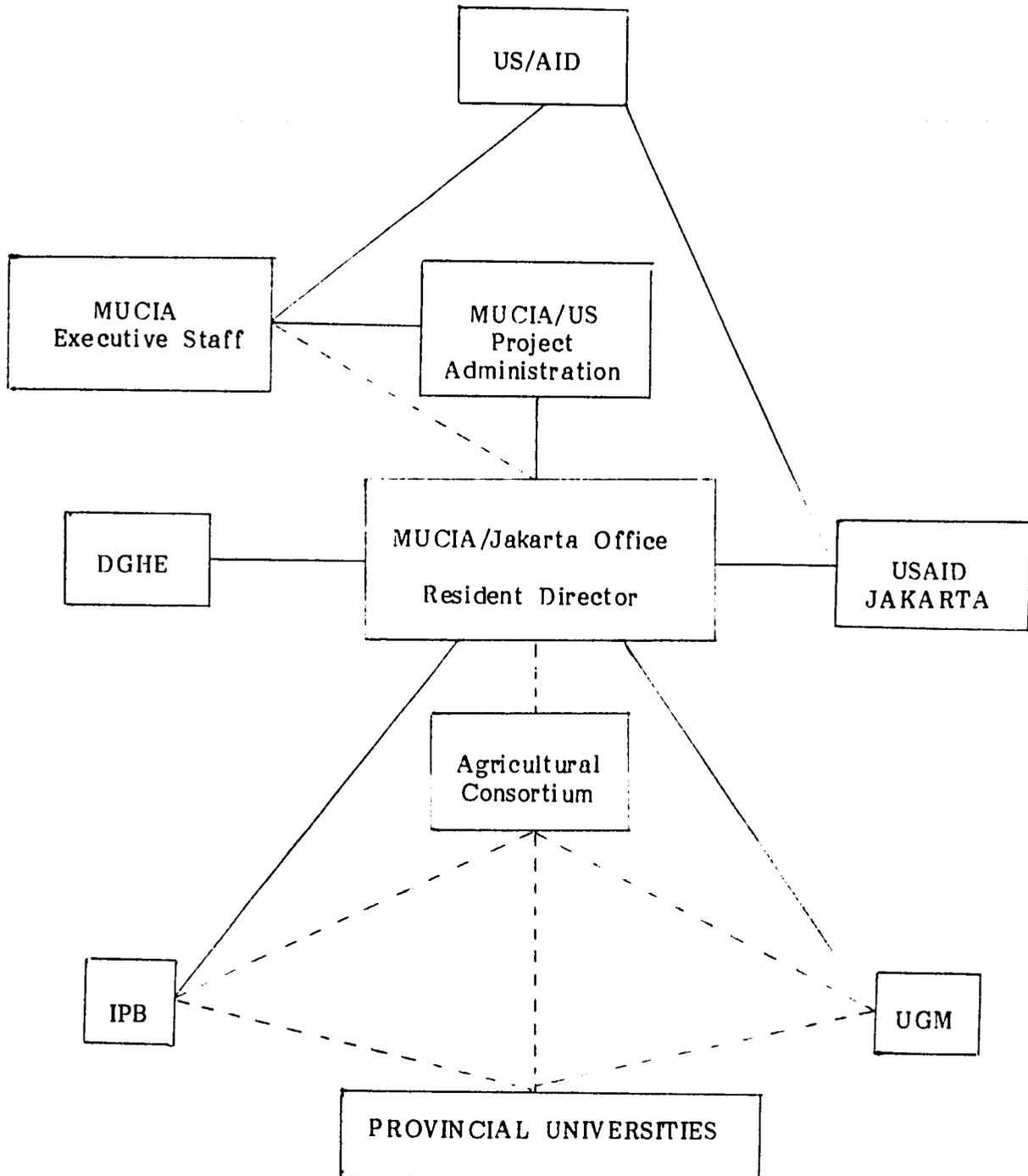
In sum, the Higher Agricultural Education Project has accomplished many of the ambitious goals laid out for it in Document X. It has sent out short-term consultants who have assisted in the Indonesian-led process of review and revision in teaching, research and public service. It has assisted high-level Indonesian administrators in the reorganization of the two institutions originally termed "feeders." Approximately two hundred twenty-five Indonesian staff members were sponsored for programs of study in administration and agricultural sciences in the United States. Purchases of books, package courses, laboratory supplies and the like have helped to improve the quality of instruction, research, and administrative efficiency. American universities, by the same token, were beneficiaries of an infusion of experience, information and insight from a group of professors with unique overseas opportunities. These people have contributed to the broadening of course content, more sensitive and informed advising of foreign students, and more effective planning of international technical assistance.

**APPENDIX A.**

**TABLES**

1. PROJECT ORGANIZATION
2. LEVEL OF EFFORT
3. LONG AND SHORT-TERM STAFF
4. PROJECT STAFF
5. PARTICIPANT TRAINING
6. EXPENDITURE SUMMARY

1. PROJECT ORGANIZATION



2. LEVEL OF EFFORT/PERSON-MONTHS

	<u>Long Termers</u>	<u>Short Termers</u>	<u>Participant Training</u>	<u>Total</u>
1969	3	0	25	28
1970	36	2	145	183
1971	42	25	419	486
1972	60	26	538	624
1973	57	37	528	622
1974	60	29	588	777
1975	42	21	920	983
1976	18	5	853	876
1977	6	0	725	731
1978	12	6	654	672
1979	12	4	579	595
1980	12	10	455	477
1981	6	2	180	188
1982	0	0	27	27
<hr/>				
TOTAL	366	167	6736	7269

C. LONG AND SHORT-TERM STAFF

<u>Position/Field</u>	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	<u>Person-Months</u>
Project Administrator															87
Resident Director															90
Program Coordinator															141
Education Advisor															48
<b>Long-term Totals</b>	<b>3</b>	<b>36</b>	<b>42</b>	<b>60</b>	<b>57</b>	<b>60</b>	<b>42</b>	<b>18</b>	<b>6</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>6</b>	<b>0</b>	<b>366</b>
Agriculture															5
Agricultural Economics															11
Agricultural Engineering															14
Agronomy															11
Animal Husbandry															6
Animal Science															28
Biochemistry															5
Botany															9
Clinical Pathology															3
Chemistry															3
Crop/Soil Science															14
Dairy Science															3
Ecology															3
Entomology															3
Fisheries															5
Food Science															10
Forestry															21
Higher Education															3
Microbiology															3
Pathology															3
Pharmacology															1
Poultry Science															4
University Administration															3
<b>Short-term Totals</b>	<b>0</b>	<b>2</b>	<b>25</b>	<b>26</b>	<b>37</b>	<b>29</b>	<b>21</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>4</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>167</b>
<b>TOTALS</b>	<b>3</b>	<b>38</b>	<b>67</b>	<b>86</b>	<b>94</b>	<b>89</b>	<b>63</b>	<b>23</b>	<b>6</b>	<b>18</b>	<b>16</b>	<b>22</b>	<b>8</b>	<b>0</b>	<b>533</b>
	1969	1970	1971	1972	1973	1974	1974	1975	1976	1978	1979	1980	1981	1982	

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4. MUCIA Project Staff in Indonesia

1. Long-Term Personnel

Project Administrators

Ira L. Baldwin	Project Administrator University of Wisconsin	1969-1971
Robert L. Clodius	Project Administrator University of Wisconsin	1971-1976
Donald Smith	Resident Director University of Minnesota	1972-1973
Robert Taylor	Interim Resident Director University of Wisconsin	1973
Sherwood O. Berg	Resident Director University of Minnesota	1973-1975
John T. Medler	Resident Director University of Wisconsin	1977-1979
Kenneth Harshbarger	Resident Director University of Illinois	1979-1981

Program Coordinators

John T. Murdock	Program Coordinator, IPB University of Wisconsin	1970-1971
Herbert Bird	Program Coordinator, IPB University of Wisconsin	1972-1973
Daniel M. Benjamin	Program Coordinator, IPB University of Wisconsin	1973-1975
Kirkpatrick Lawton	Program Coordinator, UGM Michigan State University	1970-1973
Adlowe Larson	Program Coordinator University of Wisconsin	1973-1976
Thomas King	Education Advisor, UGM University of Minnesota	1971-1973
Joseph A. Jackobs	Education Advisor, UGM University of Illinois	1973-1975
Monte Juillerat	(title), IPB Indiana University	1979-1981

2. Short-Term Experts (in alphabetical order)

Evan R. Allred	Agricultural Engineering University of Minnesota	January-April 1972
Raymond L. Arthaud	Agriculture University of Minnesota	December 1974-March 1975
Paul Bass	Pharamcology University of Wisconsin	June 1974
Carl Baumann	Biochemistry Univeristy of Wisconsin	March-June 1974; February-April 1975
Daniel M. Benjamin	Forest Entomology University of Wisconsin	April-September 1975
Herbert Bird	Poultry Science	December 1970-February 1971; July-August 1975
J. Franklin Bobbitt	Agricultural Education Michigan State University	July-September 1979
Harold S. Bryan	Veterinary Public Health University of Illinois	July-November 1972
V. B. Cardwell	Agronomy University of Minnesota	March-June 1972
A. B. Chapman	Meat & Animal Science	September-December 1973
L. O. Copeland	Crop & Soil Science Michigan State University	January-April 1975
Richard B. Corey	Soil Chemistry & Fertility University of Wisconsin	October-December 1972
Ralph N. Costilow	Microbiology Michigan State University	May-August 1973
Kenneth E. Egertson	Agricultural Economics University of Minnesota	August-November 1973
John M. Emlen	Ecology Indiana University	September-November 1974
Merle L. Esmay	Agricultural Engineering	November 1970-February - September-December 1973; January-March 1981
Neal L. First	Meat & Animal Science	February-April 1974; November 1974-February 1975

Karl E. Gardner	Dairy Science University of Illinois	March-June 1978
Upton S. Garrigus	Animal Science University of Illinois	September-December 1980
Michael Grossman	Genetics University of Illinois	August-November 1974
Henry H. Hadley	Plant Breeding University of Illinois	November 1972-February 1973
T. I. Hedrick	Food Science Michigan State University	January-March 1972; October-December 1975
Hubert R. Hess	University Administration University of Wisconsin	September-December 1971
W. J. Hooker	Plant Pathology Michigan State University	February-May 1973
B. Francis Kukachka	Forest Products University of Wisconsin	February-March 1971
Wayne R. Kussow	Soil Science University of Wisconsin	July-September 1971
Walter D. Lembke	Agricultural Engineering University of Illinois	January-April 1975
Earl R. Leng	Crop Ecology University of Illinois	February-May 1971
Daryl B. Lund	Food Science University of Wisconsin	September-December 1973
E. C. Martin	Entomology Michigan State University	September-December 1971
Clarence D. McNabb, Jr.	Fisheries Michigan State University	September-November 1980
Clinton E. Meadows	Animal Husbandry Michigan State University	February-May 1973
Lynne L. Merritt, Jr.	Chemistry Indiana University	September-December 1980
C. W. Minkel	Higher Education Michigan State University	September-December 1978

Peter G. Murphy	Botany & Plant Pathology Michigan State University	September-December 1973
J. W. Pendleton	Agronomy University of Wisconsin	December 1973-March 1974 March 1974 May-August 1980
Arthur L. Pope	Meat & Animal Science University of Wisconsin	November 1971-February 1972
A. E. Ritchie	Agricultural Economics Ohio State University	January-February 1979
E. C. A. Runge	Soil Science University of Illinois University of Missouri	July-September 1972; January-March 1973
Larry D. Satter	Animal Science University of Wisconsin	April-May 1973
J. C. Schlotthauer	Veterinary Pathology & Parasitology University of Minnesota	March-May 1972
Glen Schmidt	Animal Science University of Illinois	January-April 1976
John T. Scott, Jr.	Agricultural Economics University of Illinois	February-May 1971
Stuart D. Sleight	Pathology Michigan State University	June-September 1974
Dale K. Sorensen	Veterinary Medicine University of Minnesota	September-December 1974
J. B. Stevens	Clinical Pathology University of Minnesota	June-September 1973
Bill A. Stout	Agricultural Engineering Michigan State University	January-April 1973
Robert E. Stucker	Agronomy & Plant Genetics University of Minnesota	September-December 1971
Otto Suchsland	Forestry Michigan State University	January-April 1974
Edward L. Sucoff	Forestry University of Minnesota	June 1974-January 1975
Peter L. Tack	Fisheries Michigan State University	September-December 1972

John C. Tappeiner	Silviculture University of Minnesota	July-September 1972
Joseph Tobias	Food Science University of Illinois	September-December 1973
Charles S. Walters	Wood Technology & Utilization University of Illinois	October 1971-January 1972

3. Targets of Opportunity

Daniel M. Benjamin	Forest Entomology University of Wisconsin	August 1972
Merlin S. Bergoll	Food Microbiology University of Wisconsin	December 1974
Francis F. Busta	Food Science University of Minnesota	October-November 1971; September-October 1974
Arthur B. Chapman	Genetics University of Wisconsin	March 1976
Dale C. Dahl	Agricultural & Applied Economics University of Minnesota	October-November 1973
G. Day Ding	Architecture University of Illinois	December 1974
William B. Drew	Botany & Plant Pathology Michigan State University	February 1972
Gertrude Esteros	Home Economics University of Minnesota	November-December 1973
R. H. Hageman	Plant Pathology University of Illinois	August 1975
John B. Haygreen	Forest Products University of Minnesota	February 1975
Carl N. Hittle	Plant Breeding University of Illinois	October 1972
Shigeo Imamura	English Michigan State University	March 1972
John E. Mitchell	Plant Pathology University of Wisconsin	July 1975

Philip M. Raup	Ag & Applied Economics University of Minnesota	December 1973
Edward V. Schten	Governmental Affairs University of Wisconsin	July 1974
James B. Sinclair	Plant Pathology University of Illinois	January 1973
Gerald R. Stairs	Forestry University of Wisconsin	August 1972
Peter I. Tack	Fisheries Michigan State University	July 1974
Theodore E. Wiese	Computers University of Wisconsin	March 1977
J. B. Williams	Animal Science University of Minnesota	May 1973

E. PARTICIPANT TRAINING

MASTER'S DEGREES

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
1. ACHMAD, Sutomo	IPB	U. of Miami	1969-1973	Marine Fisheries
2. ADIMIHARDJA, Mintarsih	UNILA	Michigan State	1977-1982	Crop Science
3. AZZAINO, Zulkifli	IPB	Wisconsin	1974-1977	Agricultural Economics
4. BUDIHARTA, Setyawan	UGM	Minnesota	1974-1976	Vet-Public Health
5. DARJONO	UGM	Minnesota	1974-1976	Veterinary Pathology
6. DARMOSUWITO, Suhadi	UGM	Minnesota	1974-1977	Food Science
7. DIRDJOSUDJONO, Sasapta	UGM	Michigan State	1970-1972	Pharmacology
8. DJOKOSUARDJO, Sukandar	IPB	Wisconsin	1971-1974	Soils
9. GUNARDI	IPB	Michigan State	1973-1975	Communications
10. HANAFI	UNPAD	Wisconsin	1978-1980	Agronomy
11. HARDIMAN	UGM	UC-Davis	1970-1971	Food Technology
12. HARRAN, Said	IPB	Illinois	1975-1977	Plant Physiology
13. HAERUMAN, Murdaningsih	UNPAD	Minnesota	1979-1981	Plant Breeding
14. ISBANDI, Djoko	UGM	Illinois	1969-1971	Plant Science
15. JASIN, Hasriel	IPB	Wisconsin	1973-1975	Agricultural Economics

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
16. KARMANA, Maman	UNPAD	Minnesota	1978-1982	Agricultural Economics
17. KEMAN, Mrs. Sumijati Sunarjo	UGM	Illinois	1971-1973	Veterinary Medicine
18. KEMAN, Sunaryo	UGM	Illinois	1971-1973	
19. KUSDIARTI, Lilik	UGM	Wisconsin	1976-1978	Agronomy
20. LAY, Bibiana	IPB	Michigan State	1975-1977	Veterinary Microbiology
21. LENGGU, Samuel	IPB	Wisconsin	1972-1974	Meat & Animal Science
22. LUMBANTOBING, Togar	IPB	Minnesota	1978-1980	Forestry
23. MANAN, Syafii	IPB	NCSU	1969-1972	Forest Management
24. MANGUNDIMEDJO, Sardjono	UGM	Minnesota	1971-1977	Veterinary Medicine
25. MANSJOER, Ikin	IPB	Wisconsin	1970-1972	Poultry Science
26. MARTOYOEDO, Rini	UNPAD	Minnesota	1979-1981	Animal Science
27. NAPITUPULA, Justin	USU	Wisconsin	1974-1976	Agronomy
28. NURTJAJHO, Sutanti	UGM	Illinois	1975-1977	Botany
29. PAWITAN, Hidayat	IPB	UC-Davis	1978-1980	Hydrology
30. PRAWIRODISASTRO, Moehadi	UGM	Wisconsin	1976-1978	Entomology
31. PRIYANTO, Hubertus Aris	IPB	Minnesota	1978-1981	Agricultural Engineering
32. RAHARDJO, Budi	UGM	Ohio State	1978-1980	Agricultural Engineering
33. RIVALI, Abdul	UNPAD	Minnesota	1978-1981	Food Science
34. RUSMAN, Yus	UNPAD	South Dakota	1978-1980	Agricultural Economics

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
35. SETIJONO, Slamet	BRAW	Wisconsin	1971-1975	Soil Fertility
36. SIMANDJUNTAK, Sahat	IPB	Wisconsin	1973-1975	Agricultural Economics
37. SOEDOMO	UGM	Wisconsin	1973-1975	Animal Husbandry
38. SOEJONO, Mohamad	UGM	Michigan State	1973-1975	Animal Science
39. SOEJODONO, Roso	IPB	Minnesota	1972-1974	Vet-Public Health
40. SOEKARDONO, Soeprapto	IPB	Auburn	1969-1971	Veterinary Medicine
41. SOEMANGAT	UGM	Michigan State	1970-1973	Ag. Mechanical Engineering
42. SOEMAWINATA, Achmad	IPB	Minnesota	1974-1977	Forest Entomology
43. SOENOEADJI	UGM	Michigan State	1974-1977	Horticulture
44. SOESARNO, Wijandi	IPB	Michigan State	1970-1972	Crop Science
45. SOETJIPTO, Chip	UGM	Michigan State	1970-1972	Zoology
46. SOMODIRYO, J. Kaselan	UGM	Minnesota	1975-1979	Plant Pathology
47. SUGENG	UGENSUD	Illinois	1976-1979	Agricultural Economics
48. SULTONI, Achmadi	UGM	Michigan State	1974-1975	Forest Entomology
49. SUTARMADI, Achmad	UGM	Wisconsin	1972-1974	Agricultural Economics
50. SUWANDHI, Sambudhi	UGM	Missouri	1978-1981	Soil Science
51. SYAMSUN, Muhammad	IPB	Wisconsin	1978-1979	Computer Science
52. TJOKROSOEDARMO, Ambarwati	UGM	Minnesota	1974-1977	Plant Pathology

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
53. WARTOMO	UGM	U-Florida	1969-1971	Animal Breeding
54. WIDODO, Sri	UGM	Wisconsin	1972-1974	Agricultural Economics
55. WIKANTADI, Bambang	UGM	Illinois	1974-1976	Animal Science
56. WINARTA, Rita	DIPON	Wisconsin	1973-1975	Food Science
57. WIRADARYA, Tantan	IPB	Illinois	1978-1980	Animal Science
58. WIRORENO, Otjo	IPB	Madison	1973-1975	Business Statistics
59. YUDODIBROTO, Haryanto	UGM	Illinois	1974-1976	Forestry

PhD DEGREES

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
1. ALL, Abdullah	SYIAH KUALA	Illinois	1972-1976	Animal Science
2. ATMAWIDJAJA, Rubini	IPB	Syracuse	1970-1972	Forestry
3. AZWAR, Norman	IPB	Illinois	1971-1976	Animal Nutrition
4. BARIZI	IPB	NCSU	1970-1973	Exp. Statistics
5. DARDAK, Abu	USU	Wisconsin	1973-1977	Soil Fertility
6. DJAJASUNKANTA, H.	UNPAD	MSU	1974-1978	Agronomy
7. DJAKASUTAMI, Sulya	UNPAD	Missouri	1974-1978	Soil Science
8. DJOJOMARTONO, M.	IPB	MSU	1975-1979	Agricultural Engineering

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
9. EIDMAN, Muhammad	IPB	Texas A & M	1973-1978	Fisheries
10. GUHARDJA, Edi	IPB	Illinois	1971-1975	Agronomy
11. HADI, Soetrisno	IPB	Wisconsin	1970-1974	Forest Pathology
12. HADIKOESWORO, H.	IPB	Wisconsin	1971-1975	Agricultural Economics
13. KAMIL, Jurnalis	Andal.	Mississippi State	1972-1973	Seed Technology
14. KOSWARA, Jajah	IPB	Wisconsin	1971-1975	Agronomy
15. MAKMUR, Amris	IPB	Wisconsin	1973-1977	Horticulture
16. MARTOJO, Harimurti	IPB	U-Florida	1969-1972	Animal Breeding
17. NUR, Muhamad	IPB	Wisconsin	1971-1976	Food Chemistry, Food Sci.
18. SAMINGAN, Thajono	IPB	Wisconsin	1973-1976	Plant Ecology, Forestry
19. SARAJAR, Christoffel	IPB	NCSU	1974-1978	Forestry
20. SASTRAPRAWIRA, Ukun	UNPAD	MSU	1974-1978	Agronomy
21. SITOMPOL, Hillen	IPB	Illinois	1972-1977	Veterinary Science
22. SOEKARTO, Soewarno	IPB	Illinois	1974-1977	Food Science
23. SOEPARDI, Goeswono	IPB	NCSU	1969-1972	Soil Science
24. SUNJAYA, Prasatja	IPB	Wisconsin	1971-1975	Entomology
25. SURJOKUSUMO, M. S.	IPB	Purdue	1973-1976	Forestry Engineering
26. SUTARDI, Toha	IPB	Wisconsin	1972-1976	Animal Science

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
27. TANUDIMADJA, Kusmat	IPB	Iowa State	1970-1973	Veterinary Anatomy
28. TARYMINGKENG, Rudaolf	IPB	Wisconsin	1971-1975	Forest Entomology
29. WIDARMANA, Sadan	IPB	Minnesota		
30. WIGNJOSOESASTRO, Noerjanto	SYIAH	Wisconsin	1974-1979	Animal Science, Nutrition

MS/PhD DEGREES

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
1. ABIDIN, Achmad Surkati	IPB	Illinois	1972-1976	Horticulture
2. ADNAN, Mochammad	UGM	UC-Davis Illinois	1970-1971 1977-1980	Food Science
3. ANNUDDIN	IPB	Minnesota NCSU	1975 1975-1982	Statistics
4. ASTUTI, Maria	UGM	Michigan State	1973-1978	Animal Husbandry
5. ARBI, Nitza	Andal.	Wisconsin	1972-1976	Agronomy
6. BAIHAKI, Achmad	UNPAD	Minnesota	1971-1975	Agronomy
7. BANGUN, Arab	UGM	Illinois	1974-1981	Veterinary Microbiology
8. BEY, Achmad	IPB	Wisconsin	1976-1981	Meteorology
9. COTO, Zanrial	IPB	Minnesota	1973-1978	Forestry
10. DHALHAR, Mohamad Azron	IPB	Minnesota	1971-1973 1975-1980	Agricultural Engineering

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
11. DWIDJASATMOKO, Jusup Subagja	UGM	Michigan State	1976-1981	Zoology
12. ERIYATNO	IPB	Michigan State	1974-1979	Agricultural Food Processing
13. FARDIAZ, Dedi	IPB	Michigan State	1975-1980	Food Science
14. FARDIAZ, Srikandi	IPB	MSU	1975-1980	Food Science
15. GANI, Darwis	IPB	Minnesota	1971-1975	Education Administration
16. HADIOETOMO, Ratna	IPB	Michigan State	1973-1980	Microbiology
17. HARDJOAMIDJOJO, Soedodo	IPB	Illinois NCSU	1975-1977 1978-1981	Soil & Water Engineering
18. JUNUS, Masud	HASANUDDIN	Michigan State	1973-1977 1978-1979	Watershed Mgt./Forestry
19. JAHI, Amri	IPB	Wisconsin Ohio State	1975-1977 1977-1980	Agriculture & Extension Ed.
20. KOOESWARDHONO, Mudikdjo	IPB	Wisconsin	1972-1978	Agricultural Economics
21. MANDAGI, Johannes	Sam R.	Minnesota	1974-1980	Agricultural Economics
22. MANGKOEKOWIDJOJO, Soesanto	UGM	Minnesota Michigan State	1971-1973 1976-1979	Clinical Pathology
23. MATTJIK, Ahmad	IPB	Minnesota Colorado State	1975-1977 1977-1981	Statistics
24. MULJONO, Eddy	UGM	U-Florida	1970-1975	Animal Husbandry

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
25. NASOETION, Lutfi	IPB	Michigan State	1975-1979	Soils
26. NOOR, Zuheid	UGM	Illinois	1974-1980	Food Science
27. NOTOWIDJOJO, Wardjiman	UGM	Minnesota	1972-1974 1976-1980	Veterinary Medicine & Surgery/Veterinary Medicine
28. PALLAWARUKKA	IPB	Wisconsin	1974-1981	Dairy Science
29. PILIANG, Wiranda	IPB	Wisconsin	1975-1980	Poultry Science
30. PRAWIROKUSUMO, Soeharto	UGM	Illinois	1973-1977	Livestock Production & Marketing/Animal Science
31. PRODJOHARJONO, Subronto	UGM	Michigan State	1970-1972 1978-1981	Veterinary Medicine
32. PURWADARIA, Hadi	IPB	Michigan State	1974-1980	Agricultural & Food Eng.
33. RACHMAT, Zaki	IPB	Wisconsin NCSU	1973-1975 1975-1979	Forestry
34. SARBINI, Gusti	Lam. Mang.	Minnesota	1974-1979	Plant Pathology
35. SARWONO	IPB	Minnesota	1975-1980	Soils
36. SASTROSOEWIGNO, Soestarto	UGM	Minnesota Iowa State	1974-1977 1977-1981	Statistics
37. SASTROSUMARTO, Setijono	UGM	NCSU	1970-1975	Forest Management
38. SETIAMIHARDJO, Ridwan	UNPAD	Wisconsin U-Kentucky	1975-1978 1978-1982	Horticulture
39. SINUKABAN, Naik	IPB	Wisconsin	1976-1981	Soil Science
40. SISWADI	IPB	Minnesota NCSU	1974-1977 1977-1981	Statistics

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
41. SISWADI, Soepardjo	IPB	U-Kentucky	1970-1974	Agricultural Engineering
42. SOEBIANTORO, Bambang	UGM	Michigan State Auburn	1974-1977 1978-1981	Fisheries
43. SOEKOTJO	UGM	Michigan State	1977-1980 1981-1981	Forestry
44. SOERODIKOESOEMO, Wibisono	UGM	Minnesota	1971-1973 1978-1981	Botany
45. SOESETYA, Handojo Bambang	BRAWIL.	Minnesota	1979-1981	Beef/Sheep Production
46. SOLAHUDDIN, Soleh	IPB	Wisconsin	1975-1980	Agronomy
47. SRIHADIONO, Untung	UGM	Wisconsin U-Washington	1971-1973 1976-1980	Forestry Production/ Forestry Management
48. SUDARMADJI, Slamet	UGM	Michigan State	1970-1975	Food Science
49. SUGIANTO, Tjahjadi	IPB	Illinois	1977-1982	Agricultural Economics
50. SUKAHAR, Lukito	UNPAD	Michigan State	1977-1981 1981-1982	Resource Development
51. SUMITRO, Achmad	UGM	Minnesota	1970-1975	Forestry
52. SUPARTO, Rahardjo S.	IPB	U-Washington	1970-1973	Forestry/Engineering
53. SURYATMANA, Giat	UNPAD	Michigan State	1974-1980	Agronomy

<u>Name of Participant</u>	<u>Indonesian University</u>	<u>University Attended</u>	<u>Dates in U.S.</u>	<u>Field</u>
54. TRANGGONO	UGM	Michigan State	1976-1981	Food Science
55. UNGERER, Tonny	IPB	Wisconsin	1970-1975	Veteinary Physiology
56. UNTUNG, Kasumbogo	UGM	Michigan State	1974-1978	Entomology
57. WIRAKARTAKUSUMAH, M. A.	IPB	Wisconsin	1974-1981	Food Science
58. YAHYA, Sudirman	IPB	Wisconsin	1978-1982	Agronomy
59. ZAKARIA, Michael	IPB	Michigan State	1973-1978	Plant Pathology

Twenty or more additional Indonesian participants studied in the U.S., but received no degree for a variety of reasons.

F. GRANT 176/LOAN 041 EXPENDITURE SUMMARY

<u>LINE ITEM</u>	<u>BUDGET</u> <u>7/1/71 - 3/31/81</u>	<u>DISTRIBUTED &amp;</u> <u>ESTIMATED</u> <u>7/1/71 - 12/31/81</u>	<u>BUDGET</u> <u>MINUS</u> <u>DISBURSEMENTS</u>
Salaries & Benefits	\$ 2,280,755.00	\$ 2,213,249.00	\$ 67,505.55
Indirect Costs	914,362.00	898,698.10	15,663.90
Allowances	351,041.00	290,915.30	60,125.70
Travel	440,435.00	401,616.51	38,818.49
Equipment	2,441,201.00	2,367,177.62	74,023.38
Participants	5,645,859.00	5,899,964.52	(254,105.52)
Other Direct Costs	<u>171,968.00</u>	<u>130,029.66</u>	<u>41,938.34</u>
TOTALS	<u>\$12,245,621.00</u>	<u>\$12,201,651.16</u>	<u>\$43,969.84</u>

**APPENDIX B.**

**PREDICTING SUCCESS OF FOREIGN GRADUATE STUDENTS**

**IN U.S. INSTITUTIONS:**

**THE INDONESIAN CASE\***

DALE W. WIMBERLEY\*\*  
DONALD G. McCLOUD\*\*  
WILLIAM L. FLINN\*\*

THE OHIO STATE UNIVERSITY

**DRAFT**

May 1984

\* We gratefully acknowledge the assistance of Jayne Allison, Pam Brown, Nancy Fox, Mark Simpson, and Herb Whittier in data preparation and in the preparation of this manuscript. Thanks are also due Terry Bigalke for sharing with us some points of Indonesian culture and Suzanne Vaughan for advice on statistical problems. Any remaining errors are the sole responsibility of the authors. Direct communications to the first author at: MUCIA, The Ohio State University, 134 Derby Hall, 154 North Oval Mall, Columbus, OH 43210.

\*\*The authors are, respectively: Graduate Research Associate, MUCIA, and doctoral candidate, Department of Sociology; Associate Executive Director, MUCIA, and Assistant Professor, Department of Political Science; and Executive Director, MUCIA, and Professor, Departments of Rural Sociology and Sociology.

**PREDICTING SUCCESS OF FOREIGN GRADUATE  
STUDENTS IN U.S. INSTITUTIONS: THE INDONESIAN CASE**

The needs for skilled manpower is acute in most developing countries. These nations must build and maintain educational systems to meet future needs for personnel but the burden of this task falls on a set of institutions that frequently experiences its own shortages of qualified people.

Developing countries have adopted a variety of programs to deal with staff shortages in higher education (Altbach, 1982). One frequent approach is to send faculty and staff from Third World universities abroad for advanced training. Indonesia has taken this approach as a means of strengthening its universities. Although these programs date from the earliest days of Indonesian independence, they were dramatically expanded in the 1970's and are likely to continue their expansion throughout the 1980's.

Beginning with such USAID funded efforts as the Higher Agricultural Education Project,<sup>1</sup> which provided the sample for this study, the government of Indonesia, through the Directorate General of Higher Education within the Ministry of Education, has undertaken a program of advanced foreign training for lecturers and junior faculty of its major universities. This project was supplemented in 1978 by a second USAID funded effort involving faculty members from non-agricultural disciplines. Additional fellowship programs were funded by other governments including the French West Germans, Australians, Japanese, Dutch and British. These disparate programs were loosely held together through the Directorate General's "Project Doctor," which had a target of 400 Ph.D.'s trained abroad by 1980 (Jenkins, 1980).

While this number may seem large, it is minor in view of the depth of Indonesia's shortage and the magnitude of the demand for higher education. Indonesia, in effect,

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1. Contract No. AID/ea-176. See also Page (1978) for a summary of USAID's strategy for providing fellowship assistance to Third World students. For a broad view of foreign assistance programs and educational development, see Hurst (1981).

emerged from the colonial period without a system of higher education; before independence there were only about 3,000 college students in a total Indonesian population of 65 million. At the time of independence in 1946, there were only approximately 600 university-trained agriculturalists in Indonesia, and most of these were Dutch professionals who subsequently left the country (Thomas, 1973).

As late as 1950, the total number of graduates from the two major agricultural faculties, Gadjah Mada University (UGM) in Yogyakarta and the Agricultural Institute at Bogor (IPB), was only 10 persons. In an attempt to deal with this manpower problem in agriculture, Indonesia sought assistance from U.S. universities in the 1950's. Most of these programs were terminated in the early 1960's but reinstated in the 1970's as the Indonesian government put renewed emphasis on higher education. It decreed the formation of state universities and founded 52 agricultural facilities (Aanenson, 1979). In the late 1960's the Indonesian government also began shaping a strategy for higher education that included a standardized credit system of course work, a comprehensive state university for every province, and graduate level programs at selected national universities.

The number of faculty members holding advanced degrees remains critically small. By the end of the next five year plan in 1989, an additional 1,138 agriculturalists with post-graduate training will be required to achieve a 40 percent level of graduate training among agricultural professors. Thus approximately 4,500 professors, some holding advanced degrees and others holding only bachelors' degrees, will be attempting to teach an agricultural student body of 54,000, up from 26,000 in 1981-82. These agricultural students will be trained for roles in a society of 165 million, where 90 percent of the population are engaged in agriculture and related jobs.

While Indonesia's need to educate many people in a short time is not unique in the developing world, its problem is one of the largest. The fourth five-year plan calls for an enrollment of 457,800 undergraduate students in all fields by 1989, nearly double

the 1982 number. This goal will require an increase of approximately 17,000 college professors (Amidjaja, 1983). To have any hope of attaining these aims, the Government of Indonesia must continue to train abroad significant numbers of its current and future faculty members.

Not only must the Indonesian candidates for foreign training be chosen carefully, but also the training programs in the host country's universities must be designed with caution. Evaluation of the factors related to academic success should guide the Indonesian government and U.S. universities in program planning. Several questions will be examined here: How important are TOEFL scores and language training in predicting graduate school success for foreign students? How well do grades in the students' home institutions correlate with academic success in the U.S.? What roles do non-academic factors play in students' success? This research explores these issues for a group of Indonesian university faculty who worked toward graduate degrees in the U.S. over the past 15 years.

#### Characteristics of Individuals

Between 1969 and 1983, the Midwest Universities Consortium for International Activities (MUCIA) assisted in the training of 169 Indonesians in post-graduate agricultural study in U.S. universities. Only 23 percent of all Indonesian college professors in agriculture have advanced degrees, and the participants in the MUCIA program now constitute 24 percent of this group. Approximately 81 percent of the individuals sent for study in the United States were faculty members at either IPB or UGM (see Table 1). Although their positions varied, at the time of departure for study abroad most were junior lecturers. Their average undergraduate Indonesian GPA was 6.6 on a 10 point scale (standard deviation = 0.46 with a range from 5.5 to 8.7) and their average TOEFL score was 528, ranging from a low score of 440 to a high score of 648 points (standard deviation = 34.3). Less than one-third had had one or more

semesters of English at an Indonesian university, although most had studied English at some point during their years of formal education and many had enrolled in private courses or institutes to study English on their own. Thirty-five percent of the students took English for one to four semesters at U.S. universities.

At time of enrollment in the U.S. institution, the average self-defined age of the students was 35 years (standard deviation = 4.6 years, with a range from 25 to 48). More than 4 of every 5 were married, but only approximately one-half of the married students had dependents accompanying them. The latter proportion was no doubt relatively low because of USAID rules that required dependents' travel be paid by the student.

Forty-three percent of the individuals pursued a Master of Science degree only. Twenty-one percent wanted to pursue only a Ph.D. degree, while 36 percent planned to study for both Master's and Ph.D. degrees. They enrolled in a wide range of agricultural fields related for the most part to their teaching responsibilities, although there were cases in which an individual shifted to a new field of study abroad, usually because the home institution (UGM or IPB) planned to establish a new teaching program based on the candidate's experience. Average GPA in the United States was 3.32 (ranging from 1.15 to 3.90, with a standard deviation of 0.36). Eighty-four percent obtained the degree or degrees they pursued.

## ANALYSIS

Data were collected from the records of all degree candidates (N = 169) who participated in the MUCIA/AID Indonesian Higher Agricultural Education Project in the United States. This analysis specifically attempts to identify characteristics associated with the success of these students. Few studies have focused on predicting success among foreign graduate students in the U.S. (Hendel and Doyle, 1978), although other research has treated general problems of admission (Johnson and Gother, 1978; College

and University, 1981) or personal and psychological problems of foreign students (Payind, 1978). The most widely studied aspect of foreign student life seems to be the test of English language proficiency (TOEFL) and its implications for graduate study (Berry et al., 1978; D.C. Johnson, 1977; Lovinguth et al., 1979).

The criteria used to determine the success of each candidate are (1) his or her graduate GPA in the United States and (2) whether he or she earned the degree(s) pursued. (If completion of both the M.S. and Ph.D. were initially planned, earning only the M.S. was defined as failure.) Use of the GPA provides a measure of the quality of graduate work performed, while degree completion measures success as defined by the formal goal of the program. The two success indicators have a correlation of 0.47 ( $p \leq .001$ ). Some variables to which success may be related are: (1) the presence of the student's family members, (2) the number of the student's dependents, (3) the student's Indonesian GPA, (4) the student's TOEFL scores, (5) English training in Indonesia, (6) the student's age, and (7) the year the student began studies under the program. The relevance of family presence, previous academic success, and English training and proficiency has already been suggested. The number of dependents a student has, his or her age, and the date the student began graduate studies are primarily useful as non-substantive control variables in the multivariate analysis.

### Bivariate Analysis

Table 2 shows bivariate correlations between the success criteria, GPA and degree completion, and other variables for all available data. The most striking feature of the table are the correlations between family presence (whether some or all dependents accompanied the student) and GPA (0.34), ( $p \leq .001$ ) and family presence and degree completion (0.26),  $p \leq .01$ . That is, the student accompanied by his or her family tended to have a higher GPA and was more likely to complete the degree(s) sought. The correlation between presence of dependents and graduate GPA is comparable in

magnitude to that between Indonesian GPA and graduate GPA. The remaining correlations with graduate GPA, including those for language training and language skills, are of lesser magnitude. A similar pattern holds for correlations with degree completion.

### Multivariate Analysis

A conventional multiple regression analysis (limited to the 120 married participants for whom there were no missing data on GPA or any of the seven independent variables) was performed for GPA. Degree completion, a dichotomous dependent variable, required the use of a different multivariate technique; logistic multiple regression analysis was chosen.

Table 3 presents the initial results of the regression for GPA. Not all of the independent variables had significant effects, however, and the least significant variables were successively removed from the full equation until all remaining independent variables had effects significant at the 0.05 level. The resulting "trimmed" regression model is shown in Table 4. Only two predictors remain in the equation for graduate GPA: (1) whether the participant was accompanied by his or her dependents and (2) the participant's Indonesian university grade point average. Together these two variables explain approximately 25 percent of the variance in graduate GPA (24 percent if one adjusts for degrees of freedom). The unstandardized coefficients (b) indicate that having some or all dependents present in the U.S. raises a student's GPA 0.193 points, on the average, when Indonesian GPA is held constant. When presence of dependents is held constant, the participant's graduate GPA increases an average of 0.254 points for each point in the student's Indonesian GPA (recall that Indonesian GPA's were measured on a ten point scale).

The effect of Indonesian GPA is only slightly stronger than that of presence of dependents. Dependents' presence uniquely accounted for 8.6 percent of variance in

graduate GPA, compared to 11.2 percent for Indonesian GPA. That Indonesian GPA would have such a substantial effect is not surprising, since it is a measure very similar to the dependent variable. One expects grade point averages to correlate well. The correlation between these GPAs would almost certainly have been stronger if this were not a select group; restricting the range of Indonesian GPA (by directly and indirectly selecting participants on this characteristic) should attenuate its correlation with graduate GPA. What is somewhat surprising is the fact that presence of dependents has virtually as strong an effect as Indonesian GPA, especially when English language training and competency fail to demonstrate any significant effect on graduate GPA.

Conventional ordinary least squares regression is an inappropriate technique in the case of degree completion, since degree completion is a skewed dichotomous dependent variable. However, the logistic multiple regression model is appropriate under these circumstances and, unlike techniques such as log-linear analysis, permits the use of continuous independent variables. The chosen logistic regression procedure uses a Newton-Raphson algorithm and maximum likelihood estimation (SAS Institute, 1983). The maximum likelihood estimates (MLE, or B), are comparable to unstandardized partial regression coefficients. The proportional effect of a change in an independent variable is  $B(P(1-P))$ , where  $(P(1-P))$  is the variance of the dependent variable evaluated at P, the mean (i.e., the proportion completing the degree (Hanushek and Johnson, 1977)). A "partial R" is also reported for each independent variable; this statistic indicates the relative contribution to the model by each predictor. The uncorrected R ranges from -1.0 for a perfect negative relationship to +1.0 for a perfect positive relationship and takes a value of zero if there is no relationship. A model  $R^2$  is reported in both uncorrected form and in a form corrected for the number of independent variables. The uncorrected  $R^2$  is analogous in interpretation to the  $R^2$  used in conventional regression analysis.

All seven variables initially used as regressors in the graduate GPA model were considered as independent variables for the model of degree completion, but because of methodological difficulties in using all seven, three variables were chosen on the twin bases of theoretical concerns and the results of the regression model for graduate GPA (which is highly correlated with degree completion).<sup>2</sup> The three independent variables chosen were: (1) the presence of dependents, (2) Indonesian GPA, and (3) TOEFL scores.<sup>3</sup>

The logistic regression analysis coded had no missing data in the dependent variable or any independent variables examined. Degree completion as 0, representing failure (14 participants), or 1, representing completion (108 participants). Table 5 presents the full logistic regression model with the three independent variables. Because of the number of participants who did not complete their degrees, the model was trimmed based on outcomes of separate analyses for each of the three combinations of two independent variables. The criterion of a 0.05 level of significance was used to remove variables, as in the regression analysis of graduate GPA. Neither Indonesian GPA nor TOEFL scores were significant in any analysis using a pair of independent variables, but the presence of dependents was significant in each case. In consequence, only family presence was retained for the final model, shown in Table 6.

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2. The small number of married participants (16) who did not complete their degrees constrained the number of independent variables that could be used. For example, one rule of thumb for logistic regression analysis of binary variables is to include no more than one independent variable for each ten observations in the smaller category of the dependent variable (SAS Institute, 1983).

3. These three variables represent some of the factors that one might expect to influence graduate success most strongly among these students, namely, contact with family members, prior academic ability, and English language competency. The number of a student's dependents, a student's age, and the year the student began graduate study were merely control variables of little substantive importance; all performed poorly in the OLS regression analysis and did not seem to merit inclusion in the logistic regression analysis under the constraints of the data. English language training in Indonesia was excluded because TOEFL scores provide a more direct measure of English skills, a more relevant characteristic than mere English training.

As in the case of graduate GPA, the presence of the student's family contributes positively to completion of his or her degree. The proportional effect of a change from absence to presence of the family, 0.303, indicates that a student whose family accompanied him or her to the U.S. is estimated to be 30.3 percent more likely to complete the degrees sought.

## CONCLUSIONS

The analysis indicates that an Indonesian student's undergraduate GPA in Indonesia and the presence of family members in the U.S. are major factors associated with success in graduate school. Bivariate correlations suggest this is the case when graduate GPA, and to a lesser extent, degree completion, are used as criteria of success. Conventional regression analysis shows that the presence of dependents and undergraduate GPA each has a substantial influence on married students' graduate GPAs when several other variables are controlled. Similar results were obtained in a logistic regression analysis of successful completion of the degree (or degrees) pursued, except that only the presence of dependents had significant effects when undergraduate GPA and TOEFL scores were controlled.

These results suggest several conclusions for the evaluation of credentials and other characteristics of Indonesian students who may participate in foreign graduate education programs in the future. First, although a candidate's Indonesian GPA is already taken into account in selection for study abroad, a more stringent criterion based on GPA could well improve the collective performance of participants. This issue will increase in importance as opportunities for foreign fellowships increase; as the "better" candidates (based on higher GPA) are drawn into the program, the remaining individuals will have a statistically lower potential for success. The value of implementing a more rigorous selection criterion must be balanced against the demand for Indonesian faculty with graduate degrees and the small number of Indonesians who complete undergraduate degrees. One option might be to search for younger candidates with higher Indonesian GPA rankings rather than to maintain a priority system based on seniority.

Decisions about the selection of fellowship candidates from one cohort or another are not likely to be within the purview of the receiving university. However, a second conclusion from this analysis may be of value to sponsoring agencies, contract agencies

and the admitting university. Captured in the fact that students' previous GPA's provide a much stronger indicator of success than TOEFL scores is the implication that TOEFL scores should be evaluated flexibly in cases where an individual holds a high Indonesian GPA. Too frequently, in fact, the opposite is true: candidates are selected for programs largely because the funding and/or contracting agencies know that a TOEFL score below a specified minimum will dictate automatic rejection by the university. The proposition derived from this study is clear -- overall, the brighter students (if Indonesian GPA is accepted as a measure of this) can cope in a U.S. graduate school with a comparatively poorer command of English. Conversely, the average or below average student, as might be anticipated, needs all the help he or she can get including an excellent command of English. Perhaps an admission policy of inverse requirements for GPA and TOEFL scores is workable.

A third conclusion provides a more appropriate means of enhancing the graduate performances of married participants. Participants may be expected to have more successful graduate careers if they are accompanied by their families, a situation that would require additional financial assistance to participants. The strong impact of this variable on graduate GPA and on degree completion suggests that the value in enhanced performance may exceed the additional costs. The results of this study clearly call into question the notion that the presence of dependents will only serve to distract the student. A student's separation from family appears to be not only a personal hardship but also a threat to individual educational success and consequently to the purposes of the entire program.

#### FURTHER RESEARCH

The results of the multivariate analysis do not, of course, apply to unmarried students, who are not included in the analysis and do not have "families" as defined here. An interesting topic for further research should be to determine how unmarried

persons cope with separation from family and friends. Perhaps inherent in the condition of being "single" are sufficient secondary support mechanisms which wither after the individual marries. Whether this mechanism can easily be transferred from Indonesia to a foreign environment remains unknown.

Other issues remain unresolved as well. One set of questions involves the quality of programs in which students are enrolled: would these results hold if one were to control for variables such as the quality of the student's department (as determined by available rankings of graduate departments in U.S. universities) and the number of Indonesians enrolled in the same university? Furthermore, might such variables statistically "interact" with other variables already included in the analysis? Higher-quality departments may well have more difficult graduate programs. Presence of a student's family under such conditions may provide an important source of social support that enhances chances of success. The size of the Indonesian student population at a university might also contribute to success by providing a substitute for family presence. Conversely, the size of the local Indonesian population may counteract success, due to the possible negative impact of this variable on English competency (i.e., by reducing the student's interaction within social contexts in which only English is spoken).

Another issue is the national or cultural background of the sample group: would a student's nationality influence the results in one way or another? More specifically, does the Indonesian educational system prepare students particularly well (or poorly) to succeed in U.S. universities? Are there elements of "national character" or cultural characteristics that may make Indonesians more "family oriented" than some other peoples? Is there a cumulative impact on success -- as more and more Indonesians go abroad for study, do they return to strengthen the national system and to ease foreign study for future participants? Other participant programs managed over the past decade under MUCIA contracts suggest anecdotally that these factors are important, but more data are required to answer these questions.

**TABLE 1**  
**SOCIAL CHARACTERISTICS OF**  
**INDONESIAN AGRICULTURE GRADUATE STUDENTS, 1969-1979**

1)	Indonesian University Affiliation	
	Institut Pertanian Bogor (IPB)	49.7%
	Universitas Gadjah Mada (UGM)	31.4
	Other Indonesian Universities	18.9
	<b>TOTAL</b>	<b>100.0%</b> (169)
2)	U.S. University Enrollment	
	University of Wisconsin	27.8%
	Michigan State University	21.9
	University of Minnesota	20.1
	University of Illinois	11.8
	Other U.S. Universities	18.4
	<b>TOTAL</b>	<b>100.0%</b> (169)
3)	Year of Initial Enrollment in U.S. University	
	1969	4.1%
	1970-1972	34.9
	1973-1975	43.2
	1976-1978	15.4
	1979	2.4
	<b>TOTAL</b>	<b>100.0%</b> (169)
4)	Accompanying Dependents	
	Single-Not Applicable	13.0%
	No dependents	37.3
	One to four dependents	41.4
	Five or more dependents	3.0
	No information	2.8
	<b>TOTAL</b>	<b>100.0%</b> (169)

5) Area of Study

Agronomy	14.2%
Animal Science	11.2
Forestry	11.2
Veterinary Science	10.1
Horticulture	8.3
Food Science	8.3
Agriculture Economics	7.7
Agricultural Engineering	6.5
Other Areas	<u>22.5</u>
TOTAL	100.0% (169)

TABLE 2

ZERO-ORDER CORRELATIONS BETWEEN SELECTED VARIABLES AND SUCCESS OF  
INDONESIAN AGRICULTURAL GRADUATE STUDENTS

VARIABLES	DEGREE COMPLETION	GRADUATE GPA
1) Presence of Dependents	.26 n = 137 p $\leq$ .01	.34 n = 136 p $\leq$ .001
2) Number of Dependents	.08 n = 137 p > .10	-.11 n = 136 p $\leq$ .10
3) Indonesian GPA	.15 n = 148 p $\leq$ .05	.36 n = 145 p $\leq$ .001
4) TOEFL	.13 n = 153 p $\leq$ .05	.22 n = 151 p $\leq$ .01
5) Semesters English Training at Indonesian university	.08 n = 162 p > .10	.15 n = 160 p $\leq$ .05
6) Age	-.11 n = 161 p > .10	-.14 n = 159 p $\leq$ .05
7) First Year of Study	.08 n = 169 p > .10	-.06 n = 160 p > .10

**TABLE 3**  
**FULL REGRESSION MODEL FOR GPA (N = 120)**

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INDEPENDENT VARIABLE	b	STANDARD ERROR OF b	BETA	r	INCREMENT TO R <sup>2</sup>
(Constant)	2.02	1.09			
Presence of dependents	0.193	0.0550	0.300	0.370	0.078
Number of dependents	0.00420	0.0172	0.021	-0.061	0.000
Indonesian GPA	0.241	0.0628	0.325	0.403	0.094
TOEFL	0.00111	0.000759	0.122	0.210	0.014
Semesters English training at Indonesian University	-0.0219	0.0342	-0.058	0.040	0.003
Age	-0.00619	0.00600	-0.088	-0.154	0.007
First year of study	-0.0102	0.0110	-0.081	-0.099	0.005

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R<sup>2</sup> = 0.286

$\bar{R}^2$  = 0.241

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**TABLE 4**  
**TRIMMED REGRESSION MODEL FOR GPA (N = 120)\***

INDEPENDENT VARIABLE	b	STANDARD ERROR OF b	BETA	r	INCREMENT TO R <sup>2</sup>
(Constant)	1.57	0.396			
Presence of dependents	0.193	0.0527	0.300	0.370	0.086
Indonesian GPA	0.254	0.0607	0.342	0.403	0.112
R <sup>2</sup>	0.249				
$\bar{R}^2$	0.236				

\* All independent variables are significant at the .05 level.

TABLE 5  
FULL LOGISTIC REGRESSION MODEL FOR DEGREE COMPLETION (N = 122)

INDEPENDENT VARIABLE	MLE B	STANDARD ERROR OF B	PROPORTIONAL EFFECT	R	CORRECTED R
(Intercept)	-6.71	7.98			
Presence of dependents	2.83*	1.06	0.288	0.285	0.242
Indonesian GPA	0.744	7.918	0.0756	0.087	0.000
TOEFL	0.00595	0.00907	0.000605	0.070	0.000

\*  $p < 0.01$

Model Chi-Square = 17.02, df = 3,  $p < 0.001$

$R^2 = 0.196$

Corrected  $R^2 = 0.127$

TABLE 6

TRIMMED LOGISTIC REGRESSION MODEL FOR DEGREE COMPLETION (N = 122)

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INDEPENDENT VARIABLE	MLE B	STANDARD ERROR OF B	PROPORTIONAL EFFECT	R	CORRECTED R
(Intercept)	1.20*	0.317			
Presence of dependents	2.98*	1.06	0.303	0.302	0.262

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\*  $p < 0.01$

Model Chi-Square = 15.90, df = 1,  $p < 0.001$

$R^2 = 0.183$

Corrected  $R^2 = 0.160$

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