

APPENDIX A

EDUCATION AT BOGOR INSTITUTE OF AGRICULTURE

by Roger Packham

1. PURPOSE OF THE INSTRUCTIONAL SYSTEM

At the Bogor Institute of Agriculture (IPB), the instructional programs are clearly aimed at producing agricultural scientists rather than agriculturists. There is a marked disciplinary focus to student studies, although it is not clear whether this focus resulted from a deliberate policy or developed in response to historical needs.

Following independence, there was an urgent need for agricultural scientists to provide leadership in policymaking and research at the highest level of government. This urgent need seems to have been met, in large part. It was not clear to the evaluation team whether IPB has considered broadening its curricula in order to produce agriculturists with a wide perspective focusing on the interactions of the agricultural ecosystem (plants/animal/soils) with its environment, and the management of this total system. Discussions with faculty, students, and alumni revealed some interest in such a goal, but also a sense of the immense difficulty in trying to introduce such an innovation, given the rigid organizational structure of faculties and departments.

2. STUDENTS

Students admitted to IPB are selected from the top 10 percent of secondary school graduates. IPB has sought to maintain the high quality of its student body while expanding opportunities for students from less advantaged backgrounds and regions. To do so, it has established an innovative selection system that relies more on the recommendation of the student's school than on the student's performance on the university entrance exam. This system has been adopted nationally, but at other universities only 25 percent of students are admitted in this way, compared with 91 percent at IPB.

Students are admitted at the diploma (S0), bachelor's (S1), master's (S2), and doctorate (S3) levels. The majority of diploma students and graduate students enroll under some form of sponsorship, with a job awaiting them upon graduation. Although this is not usually the case for bachelor's degree students, to date

they have had little difficulty finding employment after graduation. About 60 percent go into the private sector and 40 percent into Government jobs. In the private sector, IPB graduates meet a range of needs in the support areas of agriculture, such as in agrochemicals, seed companies, agribusiness, and private cooperatives. Thus, their job opportunities have expanded as agricultural technology in Indonesia has become more complex. Fewer jobs are created by improvements to subsistence agriculture.

In the Government sector, bachelor's degree graduates go mainly into the Ministry of Education and Culture, where they are hired principally as university lecturers at IPB or other universities, or into the Ministry of Agriculture, as specialist advisers, extension officers, or researchers. Graduates also enter the National Planning Board (BAPPENAS); the Ministries of Cooperatives, Transmigration, and Trade and Commerce; and Government banks.

IPB graduates appear to be well accepted in these various roles, although many employers commented that it took a year for students to come to terms with their roles and recognize that they did not "know everything."

Interviews with private sector employers, alumni, and school and government officials suggest that it may be becoming harder for students to find jobs. Many felt that the majority of IPB students prefer to work in urban areas, particularly in the Jakarta/Bogor area, because of greater chances for promotion. Only students from the outer islands seem willing to seek employment in those areas. Some interviewees believed that "too many" students were specializing in some fields of study, leading to a saturation of the job market in the cities. In fact, however, manpower surveys project a continuing shortage of agricultural graduates into the near future.

IPB graduates have clearly contributed to significant improvements in the agricultural sector in Indonesia, which employs 60 percent of the workforce and generates 26 percent of gross domestic product (GDP). Although IPB is not the only supplier of graduates, until recently it has been one of only a few universities providing graduates in significant numbers. It is doubtful that Indonesian agriculture could have achieved its current level of development without them.

3. DEVELOPING THE EDUCATION SYSTEM

There are at least three key elements in planning the education program at IPB. evaluation, response to evaluation, and

forward planning for longer range program. Evaluation takes several forms. Homecoming day, which occurs every 2 years, provides an opportunity for faculty to discuss with alumni the relevance of IPB courses to the current needs of Indonesian agriculture. In alternate years, two discussion days are held at which four employers of IPB graduates from a variety of fields are invited to address selected IPB staff and students. Informal evaluation also occurs through discussions between individual staff members and students.

Curriculum revision in response to such evaluation is directed by the faculty deans. Courses are formally examined and revised, as necessary, on a 5-year cycle, with only minor changes being made at other times. New programs may be proposed at any time by a department or faculty; such proposals must be approved by the rector.

IPB students and graduates appeared to be generally satisfied with their education. Employers and graduates consider IPB graduates to be innovative and independent, although some commented that they were generally not good "team players" (which was considered both an advantage and a disadvantage). Students seemed generally pleased with the staff-student relationship: they said that experienced staff, in particular, encourage discussion where possible (in groups of 60-150), and that they felt able to approach staff for individual help outside the classroom.

Many major impacts of IPB on the Indonesian university system came through its attention to long-range planning. Among the innovations introduced by IPB are the following:

- The innovative enrollment program
- The change from a 6- to a 4-year degree program
- The introduction of the credit system
- The introduction of graduate programs
- The introduction of diploma-level programs

Many of these innovations stemmed from the dynamic and entrepreneurial leadership of faculty who had returned from training overseas with a desire to improve the university. Now the problems confronting the university are changing, and new ways of dealing with change must be developed, as well as a recognition that change is a continuous, not a one-time, process.

APPENDIX B

FACULTY OF AGRICULTURE

by Donald Barton

1. GENERAL BACKGROUND

The Faculty of Agriculture is one of the original colleges of Bogor Institute of Agriculture (IPB), which began in 1947 as the College of Agricultural Sciences. The faculty has five departments (Table B-1) and is administered by four deans. There are 287 faculty members, of whom about 230 have teaching assignments at any given time (the remainder being on study leave or temporary assignment elsewhere).

Table B-1. Faculty of Agriculture: Degrees by Department

Department	Degree			Total
	Ph.D.	M.S.	B.S.	
Agronomy	13	17	48	78
Community Nutrition and Family Resources	2	7	27	35
Plant Pests and Diseases	8	4	22	35
Agricultural Economics	22	17	39	78
Soil Sciences	<u>10</u>	<u>10</u>	<u>40</u>	<u>60</u>
Total				
Number	55	55	177	287
Percentage	19	19	62	100

Undergraduate student enrollment in the bachelor's (S1) program was 1,961 in 1986/1987, of whom about 53 percent were men and 47 percent women. Enrollment has been increasing annually. Approximately 400 students graduated in 1986/1987, whereas the cumulative total of graduates prior to 1984 was only about 575.

The research program of the Faculty of Agriculture is funded primarily by grants from Government ministries and agencies and from foreign donors. In 1986/1987 research program funding totaled approximately \$1.283 million (see Table B-2).

Table B-2. Faculty of Agriculture Research Grants, 1986/1987

Department	Number of Grants	Number of Sources	Amount (dollars)
Agronomy	7 <u>10</u>	6 <u>9</u>	155,000 a
Subtotal	17	14	155,000
Community Nutrition and Family Resources	10	10	146,000
Plant Pest and Diseases	33	5	50,000
Agricultural Economics	4 <u>5</u>	4 <u>5</u>	92,000 a
Subtotal	9	9	92,000
Soil Sciences	7 <u>7</u>	6	840,000
Total	76		1,283,000

^aOpen; no amount specified.

Source: Faculty of Agriculture.

2. FACULTY

Although the academic and teaching experience of faculty members differ, they take pride in working as peers, with senior faculty supporting the professional development of junior faculty. There are, however, two distinct groups in terms of experience and background: those who obtained advanced degrees (M.S. and Ph.D.) overseas under University of Kentucky, Midwest Universities Consortium for International Assistance, University of

Wisconsin, and other programs, and those (62 percent) who have no advanced degrees. Thus the bulk of the faculty have limited experience.

2.1 Recruitment

New faculty members are selected by the dean in response to vacancy announcements posted at IPB and at ministries. There are many applicants for each position. Candidates' academic records are screened, recommendations from faculty are examined, and final candidates are interviewed. Most positions are filled at the bottom grade, although the rector may authorize filling a position at a higher level.

This selection process results in a faculty with a high proportion of IPB graduates. Of the 177 faculty with bachelor's degrees, 164 are graduates of IPB. The administration hopes that many of these faculty will go on to get advanced degrees, preferably at overseas institutions.

2.2 Distribution of Faculty Functions

Every 2 weeks, faculty members estimate the distribution of time spent on various work functions. Faculty of Agriculture summary records indicate that faculty members allot an average of 56 percent of their time to teaching, 12 percent to research, 12 percent to extension and public service, and 20 percent to administrative tasks. However, the average is not fully descriptive. In general, senior faculty devote a heavier proportion of their time to public service and administrative activities. (Time spent with contacts or in consulting and conferences with Government agencies is recorded as public service.) Very little time is spent on extension activities. Attendance at meetings, planning of curriculum, and serving in administrative posts on the IPB campus are all recorded as administrative tasks. The unusually large amount of time allotted to administration is attributable partly to the fact that many senior faculty occupy administrative positions at IPB or at ministries to which they have been temporarily posted.

3. EDUCATION PROGRAMS

3.1 Undergraduate Program

A high priority of the Faculty of Agriculture is the selection of top-quality high school students for admittance to its programs. Efforts are made to ensure that entering students are strongly motivated toward high academic achievement. Student scores are monitored closely.

The students, faculty, graduates, and employers interviewed for this evaluation unanimously agreed that Faculty of Agriculture students are getting the best education available in Indonesia. They attribute this achievement to the quality of students, good institutional organization, the influence of a cadre of overseas-trained faculty in all departments, the positive public service attitude inculcated in students, and the good basic curriculum.

There are, however, some growing concerns about the quality of education in the Faculty of Agriculture. A new surge in student enrollment threatens to overrun the capacity of the campus. The consequences of this expansion have been larger classes, less student access to teaching staff, less opportunity for field experiments, and greater crowding of laboratories, with less chance for individual experimentation and use of equipment.

Another problem is the remoteness of the main library, which is located on the Darmaga campus, 6 miles away. Students must travel at their own expense to Darmaga--sometimes only to find that the references they need have already been checked out. Moreover, many references are not available in Bahasa Indonesia. Because many texts are available only in English, students who are proficient in English have a distinct advantage.

Employment opportunities for graduates with a bachelor's degree vary, but generally most Faculty of Agriculture graduates have found jobs within a reasonable time. Some entering students already have jobs because they have come from the outer island universities for training and have teaching posts waiting for them. Many graduates have been hired by ministries. Because many students come from or want to stay in the Bogor-Jakarta area, demands for jobs in this area are high. However, there is growing evidence that hiring capacity in the public sector is reaching its limits, especially with the Government budget limitations imposed since 1985.

A new program instituted in the Faculty of Agriculture is geared toward informing both faculty and students of the attitudes and needs of industry. In September 1987, two half-day seminars were presented by industry leaders to discuss their experiences as IPB graduates and their experiences with IPB graduates whom they have hired.

3.2 Graduate Program

Although the graduate program at the Faculty of Agriculture is relatively young, it is turning out increasing numbers of graduates with M.S. and Ph.D. degrees. The overall program is managed by the Graduate School, which sets standards for admission, identifies coordinators (from various faculties) for degree programs within each discipline, and establishes procedures for advancement to candidacy, oral examinations, thesis, and so on.

In general, students' graduate training is subsidized by a university or a Government ministry or agency. This means that in many instances, thesis research is done on topics of direct applied interest to the student's employer. In addition, employers often provide funds to support the students' research. Students who come from the national Agency for Agricultural Research and Development (AARD) often have the added advantage of being able to do their research in the laboratories and field stations of the research institutes--which often have better facilities and equipment than those that are available at IPB.

4. FACULTY CONTRIBUTIONS TO DEVELOPMENT EFFORTS

4.1 Faculty Research

Although the total funding for faculty grants received in 1986 was considerable (see Table B-2), these figures do not tell the whole story. The incentives for faculty research are limited. Although some research work is necessary for advancement in grade, since 1985 the only domestic funding for research has come from ministry grants, while external funding has been sporadic. University funds for faculty development in research, which were available on a competitive basis prior to 1985, were eliminated as a result of Government budget cuts.

The current dependence on ministry grants means that a large proportion of research is oriented toward a few major governmental goals. For instance, of the \$1.283 million available in

research grants in 1986, almost half (\$555,000) was applied to the Government transmigration program for research on soils and land use, crop recommendations, economic studies, and follow-up studies in existing or proposed transmigration areas.

In the Plant Pests and Diseases Department, half the grants (\$25,000) are from the Ministry of Agriculture's Division of Pesticide Registration and prescribe specific studies on the effectiveness of certain pesticides being considered for use.

One external donor grant is now active, a \$150,000 Agency for International Development (A.I.D.) grant for construction of a tissue culture laboratory and for 3 years of support for the Agronomy Department. The grant focuses on the training of specialists for the anticipated increase in biotechnology activity in Indonesia.

An interesting element of the current system of grant funding is the large number of faculty assigned as grant project co-workers. It is common for a research project to have a senior faculty member as project leader and as many as 10 junior faculty as research assistants. Thus, research projects do afford some opportunity for junior faculty to acquire research experience and advance their careers.

The Faculty of Agriculture is also making some use of the agreement for cooperative research between the Directorate General of Higher Education and the Ministry of Agriculture. The Department of Plant Pests and Diseases has five grants from AARD for research on the psyllid infestations of lamtoro trees, brown plant hopper infestation of rice, and the introduction and evaluation of an insect predator.

Discussions with faculty members revealed that not much farmer-oriented research is occurring; rather, a considerable volume of current research is being directed from the top down in support of government programs. Another factor contributing to the low amount of faculty contact with farmers is the fact that AARD has responsibility for national agricultural research at the farm level. Also, the link between research and agricultural extension is not well developed.

Multidisciplinary research is not a high priority in current research programs. Graduate research is also highly monodisciplinary. Some exceptions are the research on the transmigration projects concerned with soils, agronomy, and economics and programs at other research centers in which Faculty of Agriculture staff participate. One Faculty of Agriculture staff member assisted in a farming systems research project of the Center for

Environmental Studies, which was a multidisciplinary survey of farming systems in central Java.

4.2 Faculty Publications

Faculty research findings have been published primarily through the reporting processes of the research-granting agencies. However, in 1987, the dean of the Faculty of Agriculture made funds available for an expansion of departmental publications.

The Departments of Agronomy, Soil Sciences, and Plant Pests and Diseases now publish biannual technical bulletins on their research. Also, the dean has a more popular publication, which began in 1987 and is directed toward both technical and Government audiences. All these publications are of good quality.

Other publications cover workshops and conferences of the Faculty of Agriculture, many of which report research results. Also, AARD agencies produce a variety of publications that provide a forum for the presentation of thesis research results of its employees who are enrolled in the graduate program of the Faculty of Agriculture. Moreover, because these students are carrying out research on topics reflecting AARD interests, the AARD research centers and institutes are likely to publish their thesis results.

4.3 Extension and Public Service

Extension service activities are not a responsibility of IPB, and such activities do not have a high priority among staff. However, public service activity, if defined as working for or with Government agencies, is extensive. IPB graduates who work in Government ministries continue to draw on the Faculty of Agriculture for information and advice. The involvement of senior staff in such activities is generally considered by IPB faculty to be a benefit to the university because it fosters Government contacts and illuminates Government goals. In addition, these public service activities help the faculty supplement their low civil service wages.

4.4 Outreach

Among the outreach activities of the Faculty of Agriculture are those directed toward institution building at other universities. Faculty participate in such activities either as visiting staff members or by conducting special workshops, such as the 2-week workshops on food and nutrition and on agribusiness for faculty members of the 11 universities in the A.I.D. Western Universities Education project.

5. SUMMARY

The Faculty of Agriculture continues to produce quality graduates in increasing numbers. Its success is attributed to its core of well-trained faculty (many with overseas experience), organization, student selection process, good understanding of government goals, and inclination toward public service. A look to the future suggests that improvements can be made by putting further emphasis on faculty attainment of advanced degrees and by providing more and better equipped laboratories, as well as better access to library reference materials.

APPENDIX C

THE FACULTY OF ANIMAL SCIENCES

by Roger Packham

1. INTRODUCTION

The Faculty of Animal Sciences was created in 1963, when it was split off from the Faculty of Veterinary Medicine. The faculty has 70 academic staff members; 595 bachelor's degree (S1) students were enrolled in the animal sciences program for the 1987 academic year.

The aim of the faculty is to produce graduates who are skillful and creative in solving problems of society and to conduct research on and to plan and conduct programs in animal husbandry and in fields that increase the production of domestic animals. Its aim is also to increase students' ability to think and to develop their knowledge and skills in the areas of animal production, science, nutrition, animal feed science, and socio-economic aspects of animal production.

The faculty also provides programs and staff for animal-related subjects for the Graduate School and for the Faculties of Agriculture Polytechnic, Veterinary Medicine, and Agricultural Technology.

2. FACULTY

The staff of the faculty consists primarily of IPB graduates, predominantly graduates of the Animal Sciences program. Of the 70 academic staff in 1986, 25 had Ph.D. degrees--10 from U.S. universities, 5 from other overseas universities (mainly Los Banos), and 10 from IPB. Of 37 staff with M.S. degrees, 19 received them from U.S. universities, 8 from other overseas universities (mainly Los Banos), and 10 from IPB.

An Australian Development Assistance Bureau project has supported an active program to upgrade staff. Staff from overseas worked with staff of the faculty to develop skills and the curriculum. The focus of the project was on the graduate program. To strengthen the program, courses were jointly reviewed, and some staff were sent overseas for postgraduate training or other study programs.

In addition, the new research centers established under the World Bank-Government of Indonesia Inter-University program have also supported faculty research activities and research training.

3. FACILITIES

The Faculty of Animal Sciences has a number of classrooms, laboratories, meeting areas, administrative areas, and field facilities at its disposal. Field facilities have been underutilized because of a lack of operating funds for buying, feeding, and caring for animals. Equipment and laboratories suffer serious problems because of a lack of reliable power and water supplies; inadequate training of the technical support staff, resulting in poorly maintained and underutilized equipment; and difficulties getting spare parts. In addition, funding constraints prevent the purchase of necessary chemicals and other materials. Much of the equipment is old, and key items of equipment are not available.

Access to library materials also poses a critical problem. The main campus library is on the Darmaga campus, a half-hour drive away, which is costly for students in terms of both time and money. The faculty library at Bogor is poorly equipped, its holdings composed of too many old books and student theses. The relevant books at Darmaga are mainly in English, which the students find difficult to read.

4. EDUCATIONAL APPROACH

As is the case throughout the university, instruction is based on large group lectures and laboratory and demonstration classes. Classes average 60 students, and few animals are available even for demonstration purposes.

5. FACULTY CONTRIBUTIONS TO DEVELOPMENT

To appreciate the impact that the Faculty of Animal Sciences has had on Indonesia's higher education and agricultural development, it is necessary to understand the environment in which IPB functions. In particular, it is important to realize that, to a large extent, the program and impacts of both the Faculty of Animal Sciences and the Faculty of Veterinary Medicine have been aimed at supporting the goals and objectives of the Government

either directly or indirectly. Among the macroplanning goals of the Government related to animal agriculture, as described in the National Plan (Repelita IV), are the following:

- Development of smallholder nucleus livestock breeding schemes, through proper selection, castration, artificial insemination, improved feed distribution, cattle protection, and improved soil fertility
- Increased use of work cows and buffaloes
- Expansion of ranching in appropriate areas
- An integrated farming approach, appropriately incorporating goats, sheep, and pigs with crop production
- Emphasis on large-scale poultry production for export and on chicken and duck production in the villages to improve human nutrition
- Improvement of goat and cattle milk production
- Development of animal enterprises involving rabbits, quail, pigeons, turkeys, swans, and other animals

Another Government goal has been to develop agricultural education at the secondary school and polytechnic level to meet the needs of agriculture.

The following sections describe the role of the Faculty of Animal Sciences in working to realize these goals.

5.1 Human Resources

The number of Faculty of Animal Sciences graduates grew from 8 in 1967 to 112 in 1985. Altogether, 911 students have been graduated at the bachelor's level. In addition, the number of graduates of postgraduate programs grew from 0 in 1975 to 10 in 1984. Over this period, 106 students have enrolled in graduate programs and 55 have graduated.

IPB graduates are helping to meet Indonesia's demands for qualified teachers to staff the new universities, agricultural polytechnic institutes, and agricultural secondary high schools. In this way, IPB graduates are having a major impact on the development of all levels of agricultural manpower. Without this manpower, the Government's plans for improving animal agriculture could not be implemented effectively or efficiently.

M

In addition, graduates are going into the Ministry of Agriculture as research workers and extension officers. In the Ministry of Cooperatives, they provide important support for dairy development projects, while in the Ministry of Transmigration, IPB graduates provide advice on animal production aspects of the program. Graduates employed by the Ministry of Trade and Commerce or Government banks provide advice on loans for animal enterprises.

While 40 percent of graduates go into the Government and educational sectors described above, the majority go into private industry. They enter as middle and senior managers in agricultural service industries (e.g., chemical firms, feed mills) and in private cooperatives, banks, and the like.

Comments from employers and Government representatives clearly show that these graduates are having an impact. The students are regarded as open-minded and independent, displaying initiative and frankness. However, they are not always regarded as good team members. A government representative who employed graduates of IPB and of other institutes as researchers believed that IPB graduates were independent thinkers and better at experimental design than many of the others first employed, but that after a year of in-service training, there was no difference between the two groups of graduates.

Students at the Faculty of Animal Sciences generally do not specialize in extension services, preferring the livestock production and nutrition options. This preference must reflect the students' perceptions of their future employment opportunities.

It was clear from employees that demand for graduates is still great, although opportunities for rapid career advancement are not as good as they once were.

5.2 Research

Most of the research carried out by the faculty seems to be applied rather than basic research and tends to focus on surveys, evaluations, and feasibility studies. A general survey of university staff showed that fewer than one in four academicians were actively conducting research, a proportion that probably holds as well for the Faculty of Animal Sciences. To a large extent, lack of funding accounts for this low level of research activity. In fact, many research projects remain unfinished because staff researchers do not have the funds to continue. Staff are told that funds must be spread among as large a number

of people as possible. It is hoped that the new Inter-University Centers will help alleviate some of the funding constraints on research. Also, the Australian Development Assistance Bureau project has as a major component the improvement of the quality of graduate training, of which research is an important part.

Current research projects include work on the feeding of chickens, quail production, improvement of the nutrition of cattle, meat yield and quality, a comparison of imported versus domestic semen for dairy cattle, and monitoring of the bacterial content of goat's milk. Except for the research on quail production, most of this research is based on trials involving low numbers of animals, reportedly because of a lack of sufficient funding.

5.3 Extension

The major extension activity of the Faculty of Animal Sciences has been the National Student Service (KKN) program (see Section 3.6.3 of the main report). Activities under this program have been undertaken jointly by students from the Faculties of Animal Sciences and Veterinary Medicine. Thus students working in a region attempt to educate farmers on all aspects of animal health and husbandry that would lead to improved animal production. Staff also run farmer discussion groups in areas close to Bogor.

Much of the students' fieldwork for their research projects has an extension component because students often work away from the campus (due to lack of resources) in the private sector, or with farmers and commercial companies. On occasion, they also assist in Government projects.

5.4 Public Service and Outreach

Public service activities take many forms, but they consist principally of faculty service on advisory committees, temporary assignment to Government service, and the conduct of reviews for the Government. Unfortunately, such work often takes staff away from their teaching and research duties. However, the value of public services provided has to be weighed against their adverse effect on teaching and research. Examples of public service include the temporary assignment of a faculty member to the Ministry of Agriculture as the junior minister for livestock and fisheries and the temporary assignment of two faculty members as rectors of other universities. The public service activities of

other staff are aimed at supporting Government programs, particularly in the areas of transmigration, cattle reproduction, and improved animal feeds.

Outreach activities are another form of public service. Although these efforts are led by the government, they deserve special mention here because of faculty involvement in this area. The faculty has for some time been active in developing some of the 14 animal science faculties at other universities in Indonesia, particularly the newer ones, through temporary assignment of IPB staff. In addition, staff from these universities attend IPB for graduate training, upgrading courses, and seminars.

An example of an outreach activity of this kind is the relationship the IPB Faculty of Animal Sciences developed with Jambi University in Sumatra. The Faculty of Animal Sciences at Jambi was established in the mid-1960s. Because of a lack of faculty in certain areas of specialization, Jambi was unable to offer courses in those areas and so students could not fulfill their curriculum requirements for graduation. This situation was clearly an impediment to growth of the faculty, as students were not eager to enter the animal sciences program at Jambi under these conditions. The situation began to improve in 1980 when an IPB veterinary medicine graduate became Dean of Animal Sciences at Jambi. Using his relationship with IPB, he mobilized Government help to field a team of IPB specialists for temporary assignment to Jambi. Past students who had been unable to meet the curriculum requirements for a degree in animal sciences were invited back to complete their studies. Within 2 years, Jambi was turning out animal sciences graduates--including some who had begun their studies in 1964. Jambi maintains an ongoing relationship with IPB; Jambi staff are being trained at IPB in the subject areas in which expertise is still lacking, with the goal of making Jambi self-sufficient in the Faculty of Animal Sciences. The process is being supported by the A.I.D. Western Universities project.

17

APPENDIX D

FACULTY OF VETERINARY MEDICINE

by Roger Packham

1. INTRODUCTION

The Faculty of Veterinary Medicine is one of the two original faculties of Bogor Institute of Agriculture (IPB). It was established in 1907 under the control of the government Veterinary Research Institute. Many other current faculties and departments of IPB were originally departments of this faculty, including the Faculty of Animal Sciences and many of the departments that now make up the Faculty of Mathematics and Sciences. The new faculty is located on two of the three IPB campuses in Bogor. Eventually the faculty may be moved to the Darmaga campus as one unit.

The Faculty of Veterinary Medicine currently comprises the maximum allowable six departments: anatomy, physiology and pharmacology, reproduction and obstetrics, animal diseases and veterinary public health, parasitology and pathology, and veterinary clinics. These departments reveal the main purpose of the faculty, which is to educate veterinarians to help prevent, control, and eradicate animal diseases. Ensuring the efficiency of animal production is seen as a means of meeting the challenges of poverty, hunger, and malnutrition and of safeguarding human health from hazards due to unsafe animal products. The faculty also aims to train graduates to become educators in veterinary sciences in order to continue to improve training in this field and produce needed graduates.

2. STUDENTS

The Faculty of Veterinary Medicine enrolls about 150 students (60 percent male, 40 percent female) per year, or about 10 percent of the students enrolled in all bachelor's (S1) programs at IPB. The faculty has to actively promote itself to first-year students because it is not one of the more popular choices for students, despite being the only professional faculty at IPB. The low student response is due in part to the extra time required for students to qualify for their degree (5 years instead of 4), a cultural bias against animals, and the greater physical strength needed to work with large animals.

Master's degree (S2) programs are offered in the following fields: biology of reproduction, biology, veterinary science, medical entomology, and veterinary public health.

3. FACULTY

The academic staff at the Faculty of Veterinary Medicine are mainly IPB graduates with bachelor's degrees. This is not surprising, given that there are only four other veterinary faculties in Indonesia. Of a staff of 101 members, approximately 27 percent have Ph.D. degrees and 18 percent have Master's degrees. An active staff development program is underway, with as many as 24 staff away at any one time. Teaching loads are accommodated by the remaining staff. The staff development initiative will be enhanced by the Inter-University Life-Science Center, which has heavy veterinary faculty involvement.

4. FACILITIES

Inadequate facilities pose a major problem for the Faculty of Veterinary Medicine. Laboratory space is limited, and laboratories are too small. Funding for activities is always scarce. A particular problem for this faculty is its location on two campuses a half mile apart. Library materials are dispersed among five departmental libraries, the central library at Darmaga, and private staff collections.

5. EDUCATIONAL APPROACHES

The bachelor's degree program at the faculty takes 5 years to complete instead of the 4 years required at other IPB faculties. In order to provide the necessary clinical training, the Food and Agriculture Organization/World Health Organization expert consultation on veterinary education recommended 4,700 hours of veterinary courses (which does not include such subjects as English, chemistry, biology, physics, and statistics). IPB currently provides only 3,664 hours of courses. Consequently, there is a movement toward increasing the length of the program to 6 years or longer. Although such a change will be difficult to achieve for a number of reasons--the urgent need for trained veterinarians, the added cost and staff training, the limited facilities available, and the potential loss of students because of the long course of study--the faculty intends to move toward a longer program.

Currently, at the end of 5 years of study, students receive a bachelor of science in veterinary medicine in one of three areas: science stream, with an emphasis on medical subjects; professional stream, for people servicing the veterinary area but not licensed to practice medicine; and Doctor of Veterinary Medicine stream, with clinical training. The bachelor's degree requires 164 credits, with 40 percent of these in nonmedical subjects. The final clinical year reduces this proportion to 33 percent for the Doctor of Veterinary Medicine program. To date, the science stream has not had sufficient student enrollment to operate.

As is generally the case throughout IPB, courses are taught predominantly through large group lectures. Most faculty have little time to revise their lectures or otherwise supplement these large lecture classes because of their public service commitments and other constraints on their time. However, the veterinary faculty does differ from other faculties in its efforts to hold small laboratory classes with groups of only 30 students. It also offers additional support to students by assigning them to small counseling groups under the charge of an individual staff member. The formation of student study groups is also encouraged.

6. IMPACTS

6.1 Graduates

Between 1976 and 1982, the number of graduates fluctuated between 9 and 35 per year, all from the professional stream. With the increase in enrollments since 1982, the number of graduates should soon be approaching 100 per year. In 1982, an estimated 70 percent of graduates entered the private sector, joining pharmaceutical companies, large poultry companies, and animal breeding companies among others. The other 30 percent were employed by Government agencies and universities, although with the increase in graduates, that proportion was expected to increase to about 50 percent. Many veterinarians working for the Government, however, also engage in part-time private work. Of the 3,000 veterinarians, an estimated 1,900 are in the private sector.

In general, graduates have had an impact on Indonesia's agricultural development by helping the Government to achieve its goals. (These goals are presented in Appendix C, which also presents comments on graduates of the Animal Sciences Faculty,

many of which apply equally here; most employers take graduates from both faculties.)

6.2 Research

Research has been an important element of the Faculty of Veterinary Medicine. Today, new initiatives are being developed through the Inter-University Life Science Center. The more recent research projects from the graduate programs have included studies on Newcastle and Gumboro diseases of poultry, arterio-sclerosis in monkeys as a model for humans, development of new vaccines, disease transfer of malignant cattle fever, and pasteurilla and Escherichia coli in chickens.

The new Inter-University Life Science Center is expected to have an increasing impact, particularly through increased funding of research. Projects completed under Center funding include the following:

- The effect of Carbadox on biological characteristics and performance of broiler chickens and its residues in tissue
- The biological aspects of anoa (small wild buffalo found in Sulawesi)
- Antinutritional factors in mung beans

The plan for the next 5 years is to focus on the area of livestock development through four programs: feedstuffs, genetic improvement, conservation of the genetic pool, and disease control.

During 1987/1988, the major thrust of research at the facility was on embryo transfer, with four projects underway in this field. A cooperative research program had two projects: (1) a comparative analysis of health and nutrition policies related to child survival in Indonesia, Thailand, and the Philippines, with a focus on supporting breast-feeding and (2) a study estimating the prevalence of bovine leukemia virus infection in Indonesia, Malaysia, and some other Pacific rim countries. Finally, a cooperative project was continuing with the Massachusetts Institute of Technology (MIT) and the United Nations University to examine nutritional anemia in tea pickers. The research findings were being compared with results from a similar project on rural workers in Egypt.

6.3 Extension

The faculty has had a number of impacts in the area of extension. Appendix C mentions the combined efforts of students from this faculty and students from the Faculty of Animal Science during the National Student Service Program (KKN) fieldwork, which provided information to farmers on animal health and husbandry. Regrettably, no follow-up impact studies are available to assess the value of these projects or to suggest how such work can be improved.

Another extension service provided by the Faculty of Veterinary Medicine is its operation of two mobile veterinary clinics that provide animal health care services in surrounding districts. The clinics visit each district once or twice a month. The clinics are staffed by a faculty member and final-year students who are gaining clinical experience. Because of insufficient funds, service provided by these mobile clinics is limited mainly to caring for imported animals on special development programs.

Senior students also advise local villagers, and plan and implement vaccination and other health programs.

Short training courses for field veterinarians are another form of extension offered by the faculty. An example is a 2-week course on reproductive physiology given by the faculty on behalf of the Ministry of Agriculture. The goal of the course is to bring the reproduction rate in cattle and buffalo up from 17-18 percent to the ideal reproductive rate (about 38 percent) by helping field veterinarians upgrade their skills, knowledge, and techniques in the field of reproductive disorders. About 30 field veterinarians from around Indonesia will attend each of two courses.

6.4 Public Service

In common with other faculties, staff of the Faculty of Veterinary Medicine perform public service duties. The central program is the student fieldwork program. One project in which students participated was a Government program aimed at increasing the productivity of village chickens. However, no studies are available to assess the impact of this effort.

Staff members are also involved in public service activities. For example, one faculty member was asked to estimate potential vaccine production capacity in Indonesia, with

a view to planning necessary imports of vaccines or expansion of Indonesian production facilities.

Some staff are also temporarily assigned to other positions outside the faculty. For example, one professor from the faculty is currently assigned as director of private universities within the Directorate General of Higher Education.

6.5 Outreach

Outreach activities of the faculty have focused on supporting other universities and research institutes. Staff have been active in establishing and developing the Faculty of Science at the National University of Malaysia in Kuala Lumpur and have assisted Syah Kuala University in North Sumatra and Hasanuddin University in Sulawesi. Within research institutes, faculty assistance takes the form of facilitating doctoral-level research work through staff visits and monitoring of progress. Such assistance is being given, for example, to the director of the animal diseases laboratory in Medan, who is in the process of completing his doctoral-level project.

APPENDIX E

FACULTY OF FISHERIES

by George Armstrong

1. INTRODUCTION

Eleven universities within the state university system provide fisheries training. Among them, Bogor Institute of Agriculture (IPB) is the recognized leader. Its Faculty of Fisheries is old, dating back to 1963, and very large. In the early 1980s, the faculty was moved from the Bogor to the Darmaga campus. The present faculty totals 115; 22 have Ph.D. degrees, 21 have M.S. degrees, and 30 are studying for advanced degrees. Moreover, IPB has the only fisheries graduate school in the nation.

The faculty has five departments. They offer courses in sustained management of both naturally grown and cultured fish, techniques of harvesting, social and economic aspects of fisheries production and consumption, technology of processing, and marketing.

2. EDUCATIONAL TRENDS AND EMPLOYMENT OPPORTUNITIES

Three notable changes have occurred recently in the undergraduate program. First, enrollment has doubled over the past 5 years, reaching 824 students, and it continues to rise, although at a decreasing rate. Second, student preferences have shifted from aquatic resource management to aquaculture and from technical to socioeconomic aspects of production. Third, there is less emphasis on specialization. By faculty action, students will now follow a common curriculum for 2 years instead of one, with specialization beginning only in the third year.

These trends are consistent with Government interest (as set forth in the Fourth Five-Year Plan) in fishery resources as a dependable and sustainable source of income and nutrition. The trends also reflect the rising interest of the private sector in fish culture and processing and the university's sensitivity to emerging needs and its flexibility in adapting to them.

Most graduates of the 4-year program are absorbed into three main job markets: fisheries education, government research and extension, and private enterprise. Employment opportunities resulting from manpower development programs at other state-run

institutions have absorbed many graduates as junior faculty. In addition, between 1967 and 1983, about 90 special students from eight other universities graduated from IPB's Faculty of Fisheries through an affiliation program. And, since 1985, about 30 staff members of the Faculty of Polytechnic of Hasanuddin University have been accepted for training by the IPB Faculty of Fisheries.

Government jobs are available primarily through the laboratories and field stations of the Agency for Agricultural Research and Development (AARD), which maintains several research institutes specializing in marine, coastal, and freshwater fisheries; the Directorate General of Fisheries, which maintains five research and extension centers concentrating on fisheries problems; the Agency for Agricultural Education, Training, and Extension (AAETE); and the National Institute of Oceanology, which is an arm of the Indonesia Institute of Science.

Increasing numbers of students, attracted by relatively high wages, are moving into the private sector, many of them as managers of fish hatcheries or credit evaluators and monitors for banks.

The graduate program is also growing, from 4 M.S. degree candidates in 1985/1986, to 10 M.S. and 1 Ph.D. degree candidate in 1986/1987 and an additional 15 M.S. and 2 Ph.D. degree candidates in 1987/1988. Most of the candidates are employees of universities or institutes.

3. AREAS OF FACULTY IMPACT

3.1 Research

The research output of the Faculty of Fisheries during the 1980s has been materially reduced because of several factors. First, four of the five faculty departments were created after 1980; consequently, much faculty energy and time necessarily went into course and syllabus development, study for advanced degrees, and newly assigned administrative work. Second, the move from Bogor to Darmaga, which took place during the early 1980s, took many months to complete. Third, relatively few faculty members had advanced degrees in the early 1980s (although many of them do now), a factor that limited the ability of faculty to confront complex fisheries development issues. Fourth, physical facilities for research were (and continue to be) limited, particularly supplies and equipment. Finally, the undergraduate research budget was eliminated in 1985.

Consequently, for the past several years, faculty research has consisted largely of theses and dissertations developed as partial requirements for advanced degrees. The faculty considers many of these research projects to be good, but the money to publish such papers is hard to find. Projects with strong practical applications have attracted the most attention, and their findings are being used in the field.

3.2 Public Service and Extension

As in many other faculties, public service work and extension suffered because of shrinking transportation and laboratory budgets. Occasional farmer requests for help with practical problems are honored when possible; however, such assistance is limited because of lack of laboratory chemicals and adequate equipment.

Faculty do not believe that Government services are bridging the extension gap they cannot fill. Most extension service personnel are either generalists or high school graduates, without the specialized training needed to adequately address fisheries problems in the field.

One extension technique, which combines demonstration with monetary incentives, has been used by the faculty to solve several problems simultaneously. Farmers are offered a rental plan for their pond that promises a net return equal to or greater than their current return. Faculty and students use the pond for a fish culture operation, applying the latest approved methods. The farmer is encouraged to observe what they do. The profits from the aquaculture operation go to the students and their faculty supervisors. The outcome is that more farmer-producers are motivated to adopt the new approach, students and faculty "learn by doing" while enhancing their incomes, and faculty-private sector relationships are established.

3.3 Outreach

The faculty's outreach contributions have been extensive. During the 1960s and 1970s, the faculty accepted fourth-year students from provincial universities. These students completed their last year at IPB and then returned home and received their degree from their parent university.

In another outreach program, staff members from selected provincial universities come to Darmaga for 6 months to 1 year to study in a specialized field (e.g., limnology). The emphasis of the program is on teaching. Students learn by assisting in laboratories, assessing lecturing techniques, and helping to prepare course materials.

In addition, IPB Faculty of Fisheries staff sometimes go to provincial institutions to help set up laboratories, demonstrate the use of equipment, or conduct experiments. The faculty also helps to train Government fisheries service personnel from the provinces to carry out special jobs, such as inspection and sampling to determine compliance with import/export regulations.

Finally, the AAETE or the Directorate General of Fisheries conducts training courses, to which IPB is invited to contribute. IPB Faculty of Fisheries staff give lectures and demonstrations and otherwise work to strengthen agency programs. At such meetings, and while visiting outlying campuses, faculty are often drawn into advisory and consulting roles. Deans and leaders from other universities invite the faculty staff to comment on procedures and techniques for establishing fisheries departments, developing curricula, selecting appropriate equipment, or designing laboratories. Thus, institution building, through both informal and formal channels, has been a notable faculty activity.

4. OBSERVATIONS AND CONCLUSIONS

As large as it is, the Faculty of Fisheries is being strained by current events to meet its commitments to a growing student body, expanding educational needs in the provinces, increasing private sector interest in fisheries, and continuing demands by Government for specialized personnel.

Teaching and outreach have been the faculty's major long-term contributions. Involvement in public service has been minor, due in part to budget limitations.

Research has languished. However, with the departmental reorganization and the move to Darmaga completed, and as more faculty members earn advanced degrees, faculty attention is being refocused. Research is viewed as a force that can strengthen and improve classroom teaching; help meet the practical needs of producers, processors, and marketers; generate income for student support; and upgrade in-house facilities.

The large, highly specialized faculty, with its new physical plant and growing resource base, represents a major Government

investment. The challenge facing the faculty is how to use its resources to best advantage.

The next logical step in the faculty's development is long-term planning to redefine and clarify faculty goals and priorities. Although planning must take advantage of the unique strengths of the faculty, it must also remain consistent with the goals and priorities of the central Government and of IPB.

APPENDIX F

FACULTY OF FORESTRY

by George Armstrong

1. 1975 STUDY OF FORESTRY MANAGEMENT

Four of the eight universities in Indonesia offering forestry training have a faculty of forestry, while the rest have a department of forestry. The Bogor Institute of Agriculture (IPB) has the oldest Faculty of Forestry. Created by the Dutch during the 1940s, it was absorbed into the Faculty of Agriculture about 1950 and became a faculty of IPB in 1963. Today it is divided into three departments, has a professional staff of 98, and offers a basic 4-year undergraduate curriculum (the model for which originated at IPB in 1972). Since 1978, it has also offered graduate training at the master's degree and Ph.D. levels. Gadjah Mada University is the only other institution offering such a program. As leading (pembina) institutions, both have a responsibility to assist other developing institutions in strengthening their staffs and programs.

A landmark 1975 study of forestry education in Indonesia described the IPB Faculty of Forestry and its program, reviewed important areas needing development, and made recommendations for development. It is against the findings of this study that the changes of the last 10-12 years at IPB are assessed here.

The 1975 study correctly foresaw several changes affecting forestry in Indonesia: substantial expansion of forest exploration in the Outer Islands, rising awareness of the importance of the ecological role of the forest, increasing interdependence of forestry and agriculture, and a resulting need for several thousand trained forestry professionals to fill forest management, teaching, and research positions in the Government.

However, the study found the universities to be poorly equipped to meet such needs. At IPB, the nation's largest forestry faculty (40 persons, only 37 percent of whom had graduate degrees) was admitting 44 students a year and graduating only 36. Small enrollments and attrition signaled one kind of delay, while the 5-year curriculum signaled overeducation and still another kind of delay. The clear-cut need was to increase and speed up the output of graduates. But faculty salaries were low, and faculty members were accepting employment or contracts with other agencies, thus limiting their teaching time. Furthermore, course overlaps, irrelevant material, and important omissions (particularly management and ecology) weakened the curriculum. In the

classroom, the study found an overemphasis on lectures and a critical need for a 3-year technical training program to help meet Indonesia's need for an estimated 13,000 forestry technicians.

Sponsored research at IPB at the time of the 1975 study consisted of four short, unrelated projects, whereas national needs for research were viewed as overwhelming. The significant constraints to research were small budgets and lack of trained people. The team suggested that greater efficiency could be gained through specialization among universities. Specialization was suggested in wood products and pine plantation research for IPB, in watershed management and teak plantations for Gadjah Mada, and in management of natural forests for Outer Island schools. Forestry economics, products development, wildlife management, ecology, inventory, administration, and genetics were identified as areas of priority research and faculty preparation at IPB.

2. TWELVE YEARS LATER

2.1 Introduction

From today's vantage point, the 1975 study was clearly correct in its prediction of major trends and in its concern that Indonesia would be unable to produce the large numbers of trained people or conduct the research that the country needed. Nevertheless, many of the recommended adjustments have been made. A 4-year curriculum has been adopted, and enrollments have increased: some 200 students are enrolled and an equal number graduate annually. The faculty is 150 percent larger than it was in 1975, although the proportion with advanced degrees is still only 37 percent. A new department, the Department of Forest Resource Conservation, has been added, and the curriculum has been revised to strengthen coverage in that area. A Forest Economics Study Program also has been added as a management option, and an introductory forestry course provides an overview of forestry issues and activities.

The graduate program, initiated in 1978, has produced increasing numbers of master's and Ph.D. degree graduates. Most graduate students are Government employees training for more advanced teaching and research positions. Thesis research by these students is typically oriented to priority problems faced by the offices or institutions to which they belong. Facilities for the research often are provided by the employer.

Teaching continues to be dominated by the lecture, and texts and professional literature are still underemphasized. The underlying reasons for these tendencies are low faculty salaries; off-campus staff assignments; scattered, weak library resources; declining foreign-language facilities; and inadequate budgets for books and journals. The low salaries force extracurricular employment and encourage faculty members to reduce the time spent on course preparation. For example, the technique of using tested lecture notes apparently endures primarily because it saves time.

To meet the need for technicians, a network of polytechnic institutions is being created on the campuses of established universities. These polytechnic institutions provide 1- to 3-year, postsecondary training. One of six such institutions now operating is the Polytechnic of the University of Mulawarman in Samarinda, East Kalimantan, which will offer a course of study in forestry. At present IPB is providing forestry training to 12 potential faculty of this polytechnic unit.

2.2 Research

If forestry research needs were overwhelming in 1975, they are even more so now, with the acceleration of forest industrialization, social problems created by a growing population, newly recognized environmental problems, and economic problems. One response of the Government to this problem has been to develop offices and institutes to support and conduct research. Within the Ministry of Forestry, the Board for Forestry Research and Development, on which IPB is represented, guides the programs and activities of the Forestry Research and Development Center, the National Biological Institute, the Southeast Asian Regional Center for Tropical Biology, the Board for Technology Research and Development, the Directorate General of Reforestation and Land Rehabilitation, the Soils Research Institute, the Ministry of Population and Environment, and various wood-using industries.

Despite such broad and varied research interest in forestry affairs, faculty accomplishments are modest. The major reasons are clear: limited funding and lack of trained people to tackle the many problems effectively. In 1985/1986, the IPB forestry faculty, numbering over 80 people, was involved in research projects totaling no more than \$200,000. Although the staff of the IPB Faculty of Forestry represented the strongest single collection of trained foresters in the nation, their input to research was limited because of funding constraints.

The quality of research also suffers for other reasons. Lack of adequate laboratory space, machinery, and equipment is a problem; unreliable or inadequate statistics is another. A 1979 study by the Faculty of Forestry put the problem this way: "Inconsistency of figures on forest products proves a dominant feature, whereas basic, pertinent data are in many cases unavailable."¹ The situation appears to be much the same today. A third problem has been weak interdisciplinary communication, which has tended to inhibit a broad attack on complex problems and to generate a narrow response to issues.

Although faculty members continue to seek sponsors for research, opportunities are becoming scarcer. There is some indication that the percentage of faculty time spent on research activity is declining.

2.3 Outreach

The Government is developing other smaller forestry training institutions in outlying areas. Several need help, not only in training faculty but also in designing curricula and establishing an effective working environment, including laboratories and classrooms. Although IPB continues to provide training for prospective faculty members for such institutions (e.g., field visits and personal faculty guidance), it is doing so less often because financial support for such activities has been severely reduced.

2.4 Public Service

Faculty members engage in public service through their temporary assignments to Government agencies and by providing information and guidance to the general public. Several distinguished members of the Faculty of Forestry hold important positions within the Government, including the Director General of Forest Protection and Nature Conservation in the Department of Forestry, Assistant to the State Minister of Population and Environment, Rector of Mulawarman University, and Rector of Cendrawasih University. Several others serve on boards, committees, and other Government bodies on a part-time basis. Although these activities detract from on-campus teaching, research, and other univer-

¹Bogor Institute of Agriculture Fakultas Kehutanan. 1979. "Forestry for Industrial and Rural Development in Indonesia." Bogor: Indonesia: IPB.

sity involvement, they permit IPB to make valuable contributions to national planning and decision-making and to strengthen university-government linkages.

Service to the private sector is increasing, in part because of the new, vocal constituencies that are demanding attention. For example, private conservationist groups, industrial associations, concessionaires, marketing groups, and the media look increasingly to the university as a source of unbiased information and opinions on current issues. In addition, an increasing number of farmers and other private citizens who have forestry-related problems look to the university for assistance.

Building this important communication bridge with emerging interest groups and earning a reputation for truth and accuracy in the analysis of forestry issues are increasingly recognized as valuable tasks of the Faculty of Forestry.

APPENDIX G

FACULTY OF AGRICULTURAL TECHNOLOGY

by Patricia Vondal

1. INTRODUCTION

The Faculty of Agricultural Technology, created in 1964, is one of the original faculties of the Bogor Institute of Agriculture (IPB). In 1983, it moved to the new Darmaga campus, thus enabling it to significantly expand its facilities. The faculty's special niche in the field of technology is its specialization in agricultural technology. The goal of the faculty is to engage in teaching, research, and public service activities in order to improve pre- and post-harvest technologies. A particular objective is to improve the quality, nutrition, and safety of Indonesian food products for domestic and export markets by focusing on processing, storage, and marketing technologies.

Like the other faculties at IPB, the Faculty of Agricultural Technology is administered by a dean and vice deans for education, research, and public service, respectively. The faculty has three departments: Food Technology and Nutrition, Agroindustrial Technology, and Agricultural Mechanization. Table G-1 lists the departmental laboratories for research and curriculum development.

2. STAFF

Of the 117 staff members in the Faculty of Agricultural Technology, 21 percent have Ph.D degrees, 25 percent have master's degrees, and 55 percent have undergraduate degrees. As is the case for the other IPB faculties, most of the teaching staff (91 percent) has been recruited from within IPB.

As part of its staff development plan, the administration tries to send its teaching staff to outside institutions (preferably abroad) for graduate education. A particularly important source of fellowships for overseas postgraduate training of faculty staff was the Agency for International Development (A.I.D.), through the Midwest Universities Consortium for International Activities (MUCIA) program, which ended in 1978. Since then, important sources of fellowships have been the British Council for study in England, the Columbo Plan for study in Australia, the Japanese foreign assistance program, and the Belgian Government. Currently, fellowships are also available from the

Food Science Inter-University Center funded through the World Bank.

Table G-1. Laboratories of the Faculty of Agricultural Technology, by Department

Department	Laboratories
Agricultural Mechanization	Tools and Machines of Agricultural Estates Land and Water Technology Systems Managements of Agricultural Mechanization Agricultural Energy and Electricity Food and Agricultural Product Technology Agricultural Building Construction
Agroindustrial Technology	Industrial Technology Chemical Technology Marketing Bioindustry
Food Technology and Nutrition	Food Chemistry Food Microbiology Food Processing Food Biochemistry and Nutrition Food Industry

3. EDUCATION

3.1 Undergraduate Education

3.1.1 The Student Body

The students at the Faculty of Agricultural Technology are among those with the highest grade point averages at IPB, in part because graduates of this faculty are offered some of the highest paying private sector jobs in the country. Graduates of all three departments usually find employment within 3 months. Thus the competition for admission to this faculty is great, and only

students with the highest academic standing after their first year at IPB are accepted.

Undergraduate enrollment has grown rapidly, increasing by 65 percent between 1982 and 1986. Not all the increase is related to the faculty's popularity; part is due to the universitywide mandate from the Directorate General of Higher Education to increase enrollments. The faculty contains one of the lowest female student populations at IPB: only 27 percent of the 879 undergraduate students in 1985/1986 are women (see Table G-2). Although total student enrollment is almost equally divided among the three departments, female enrollment fluctuates widely among the departments. The largest percentage enrollment of women is in the Food Technology and Nutrition Department (42 percent of the 292 students), while the smallest percentage (12 percent of the 303 students) is found in the Agricultural Engineering Department.

Table G-2. Faculty of Agricultural Technology Student Enrollment by Gender and Department, 1985/1986

Year/Gender	Agricultural Mechanization Departments	Agroindustrial Technology Department	Food Technology and Nutrition Department
Second			
Men	76	58	53
Women	11	30	35
Third			
Men	76	67	52
Women	10	16	33
Fourth			
Men	115	83	63
Women	15	30	56
Subtotal			
Men	267	208	168
Women	<u>36</u>	<u>76</u>	<u>124</u>
Total	303	284	292

3.1.2 Curricula and Training

Curriculum in the Agricultural Mechanization Department includes basic courses in agricultural science, soil science, agronomy, thermodynamics, fluid mechanics, machinery mechanics, climatology, and hydrology, as well as an introduction to the basic equipment used by rural agriculturalists in Indonesia. Most of the remaining courses are related to the analysis of material and mechanical construction for agricultural technology development, including machinery and technology for factories, farms, and irrigation facilities. Graduates of this department are prepared to work in private industries concerned with technology research, development, and production.

The Agroindustrial Technology Department focuses on the agricultural product industry. This program of study is the only one of its kind in Indonesia, and the faculty is currently awaiting approval from the Directorate General of Higher Education to add a new master's degree program in agroindustrial technology.

At the bachelor's (S1) level, basic courses are offered in biology, food science, and chemistry, as well as in chemical analysis, economic analysis, computer applications, and statistical analysis. The majority of course work is related to the food industry and includes industrial operations and processes, industrial regulations, statistics, and planning and management. Courses are also given in industrial sociology and personnel management. Graduates are prepared to work in the private food industry or estate crop management and in public agencies involved in setting production targets for basic consumption and export crops.

In the Food Technology and Nutrition Department, the curriculum is structured to prepare students for employment in the food industry, including the design, planning, improvement, and marketing of food products. Graduates also find employment with the Ministries of Agriculture, Industry, Health, and Trade. Basic courses include analytical chemistry, biology, biochemistry, statistical methods, computer applications, economics, rural sociology, and introductory food technology. More advanced course work concentrates on food chemistry, food technology, food microbiology, fermentation technology, and nutritional analysis.

3.1.3 Laboratory Facilities

Practice and basic research in laboratories are a crucial element of education in this faculty, and it is in this arena

that problems occur. There is essentially no budget for lab materials for undergraduate use or for basic student research. Available funds are primarily for graduate students and faculty staff. Hence, students must pay for their own research and for basic laboratory materials, which certainly adversely affects the scope and quality of student work.

3.2 Graduate Education

Associated with the Faculty of Agricultural Technology is the graduate program in food science, which offers master's and Ph.D. degree training. The best students from the Food Technology and Nutrition department are admitted to this program, which also provides advanced degree training for the faculty staff. Graduate enrollment also includes staff from food science departments of Outer Island universities. Students in this program benefit from the facilities and equipment at the associated Center for Food Technology Research and Development, which is one of IPB's research centers. IPB was also selected as a site for the Food Science Research Center funded by the World Bank under the Inter-University Center program. This facility is currently under construction next to the faculty building. In the future, this Inter-University Center will provide not only equipment and materials for research in food science, but also instruments for the food technology research center. This center and its associated programs will certainly augment the quality of graduate and undergraduate programs at this faculty.

3.3 Summary

In summary, the Faculty of Agricultural Technology at IPB is producing graduates knowledgeable in agricultural technology and all aspects of the food industry. Graduates are prepared for employment in production, planning, or management in both the public and private sectors. With the decline of oil revenues, private sector food production for export has become increasingly important to the Indonesian economy. It is in this area in particular that IPB graduates from this faculty will be making their impact.

4. FACULTY INVOLVEMENT IN RESEARCH, OUTREACH, AND EXTENSION

4.1 Research

The Faculty of Agricultural Technology has had substantial impacts through its research, much of which has involved innovative breakthroughs related to the food industry in Indonesia. The processed food industry, particularly the export segment, is in its infancy and there are few other universities in Indonesia that have the critical mass of trained staff, facilities, and equipment to contribute to the development of this industry.

Research is highly encouraged by faculty administration. Staff members are expected to develop their own research proposals. Submitted proposals are subject to approval by the department head and the vice dean of education, research, and public service before they can be submitted to donors for funding. Thus, some level of quality control is exercised at the faculty administrative levels.

Prior to 1985, research funds were available through grants from the Directorate General of Higher Education to the Center for Food Technology Research and Development. Current research funding comes from a number of outside sources, including the United Nations University in Japan, the International Foundation for Science in Sweden, A.I.D., and the International Atomic Energy Agency in Austria. Indonesian Government research funds are obtained from the Ministries of Agriculture, Industry, Health, and Transmigration, as well as from the Central Bureau of Statistics. The Food Science Inter-University Center will provide a new source of research grants once it becomes fully operational.

In addition, some research work is done under contract to ministries or the private sector. For example, the Penari Bali coffee company asked the staff to help improve its process for producing instant coffee, a widely sold product in Indonesia. The Agroindustrial Technology Department, in particular, has actively encouraged private industry research funding by sponsoring a national symposium with representatives from both private industry and government.

Most staff research in this faculty is directed toward one of the following goals: (1) improving agricultural technology for production, (2) decreasing post-harvest losses, (3) improving production forecasting for key commodities related to market demand, (4) improving the nutritional quality and sanitation of traditionally prepared foods, (5) designing agroindustrial facil-

ities, and (6) developing processing methods for commercial application for Indonesian food commodities. There is little emphasis on new food product development.

Research in developing processing methods for commercial applications is particularly important because Indonesia, lacking the processing capabilities for large-scale commercial enterprises, has always exported its basic commodities in raw form for processing elsewhere. Indonesia has had to purchase imported processed coffee, spices, candy, dairy products, and other items for which it had provided the raw ingredients.

Faculty contributions to Indonesia's food processing industry are but one example of the faculty's impact on the agricultural sector of Indonesia's economy. With the advent of the new research facilities, instruments, and funding from the Food Science Inter-University Center, this faculty can be expected to continue, and even raise, its level of high-quality research.

4.2 Outreach and Extension

Like many other faculties at IPB, the Faculty of Agricultural Technology is involved in outreach and extension activities in fulfillment of its public service mandate. Staff from its departments are sent for short-term teaching projects and as advisers to several universities in Indonesia to strengthen their food science departments. Staff also provide training courses on industrial management and technical skills to the Ministry of Industry. Such outreach activities facilitate the trend toward developing food production technologies.

The main goal of the faculty's extension activities is to increase industry awareness of hygienic methods of food processing and storage. However, the faculty does not specialize in extension activities and offers no extension courses. Rather, employees involved in extension work within the Ministry of Industry are trained by staff from the Food Technology and Nutrition Department in techniques of sanitary food preparation, which are then taught to roadside restaurateurs and other food vendors in the area. Under the National Student Service program, undergraduate students are expected to teach villagers the techniques for sanitary food preparation and storage that they have learned in their classes.

APPENDIX H

SOCIAL SCIENCES

by Patricia Vondal

1. INTRODUCTION

The Faculties of Fisheries, Animal Sciences, and Agriculture in the Bogor Institute of Agriculture (IPB) all have a Department of Social Sciences (or Social Economics). The Department of Social Economics in the Faculty of Agriculture is the largest department on campus (larger even than some faculties), with a current student body of 558 and a teaching staff of 72. Since 1983, attempts have been made to create at IPB a faculty of social economics, which would presumably unite all three departments (see Section 6 below).

The Social Economics Department in the Faculty of Agriculture has the highest proportion of staff with advanced degrees within IPB (56 percent); 58 percent of the 40 staff members with advanced degrees have a Ph.D. degree. The high education level of the staff has been one of the department's attractions and an underlying factor in some of the impacts it has made.

One reason for the high educational level of the department's staff is that the Faculty of Agriculture has always placed high value on the socioeconomic aspects of agriculture and the Ministry of Education has historically supported social science programs in agricultural colleges. Accordingly, between 1958 and 1965, many of the staff of the Faculty of Agriculture were sent abroad under fellowships from the A.I.D.-University of Kentucky program to obtain graduate degrees in agricultural economics and rural sociology. The staff trained under this program formed the core faculty of this department.

Social sciences at IPB have always been related to agricultural issues and agricultural development in Indonesia, with an emphasis on agricultural economics, extension, farm management, rural sociology, and survey fieldwork. Theory is supplemented by survey fieldwork in order to instill in students an orientation toward the study of actual village situations.

2. EDUCATION

2.1 Undergraduate Programs

The Department of Social Economics offers three undergraduate programs, which begin after the students' first common year: agribusiness, extension and education, and agricultural and resource economics. The staff has planned these programs to meet the changing needs for social science skills related to agriculture in Indonesia. Until 1986, students could choose either agricultural extension or agricultural business for their area of concentration. In 1986, the agricultural business program was split into two areas of concentration, one related primarily to natural resource and agricultural economics and the other to large-scale and agroindustrial farm management and finance. These two programs are scheduled for further development because of a general concern that they are not sufficiently differentiated.

Prior to the establishment of the three program areas, students chose overwhelmingly to enter the agricultural business concentration (see Table H-1) because of the perceived lack of job opportunities in agricultural extension. Even today, courses in economics and business management (excluding research methods and data analysis) still predominate in the department.

Among the department's undergraduate programs, the agribusiness course of study has had the greatest impact. Its strength is most likely attributable to the high number of staff with overseas graduate training.

Graduates of the department are filling a continuing need for specialists in agricultural policy and program analysis and research. The majority of the students graduating in this field have found employment within the public sector. Until very recently, most graduates were employed by Government agencies and agricultural research centers under the Ministries of Agriculture, Population and Environment, and Cooperatives, and the major banks (in relation to credit for agricultural commodity production for farmers). However, as Indonesia's private agricultural and food industry sector continues to develop, the trend toward seeking employment in the public sector may change. According to students in this program, many graduates prefer to seek higher paid employment in the private sector in agricultural related business and industry.

Table H-1. Student Enrollment in Social Economics Programs, 1981-1986

Program Year/ Concentration	1981/82	1982/83	1983/84	1984/85	1985/86
Second ^a	122	152	172	185	193
Third					
Agribusiness	66	85	86	119	122
Agricultural Extension	40	39	46	50	50
Fourth					
Agribusiness	42	67	77	109	115
Agricultural Extension	<u>11</u>	<u>53</u>	<u>24</u>	<u>48</u>	<u>47</u>
Total	281	394	405	511	527

^aStudents do not choose a specific program of study until their third year.

2.2 Graduate Programs

The graduate program in agricultural economics has also had an impact, due largely to the reputation and experience of the trained staff. Begun in 1975, the graduate program is one of the three largest at IPB. One of the major clients of the program is the Center for Agro-Economic Research, which is part of the Agency for Agricultural Research and Development (AARD). Some 55 percent of the 38-member senior research staff received a master's degree in agricultural economics from IPB. Twenty-five percent of the research staff have undergraduate degrees in agro-economics from IPB and were directly recruited by the center, with a view to sending them back to IPB for further graduate training (Ph.D. candidates are sent abroad to gain a different perspective). The center's major contribution to Indonesia's agricultural development is through its program of issue-related research and analysis and the analysis of policy alternatives for decision-makers in the agricultural sector.

The graduate program in agricultural extension and communication has had less of an impact. (The program is discussed in detail in Section 3.5 of the main report.) Basically, it is agreed that individuals graduating in this field require considerable technical expertise outside the social sciences if they are to be hired by the Government as extension workers. Graduates tend to work as generalists outside their area of specialization or as low-level management assistants in government. Some students interviewed indicated that they planned to become journalists writing articles on new products and technologies for farmer magazines, newsletters, and newspapers. Top students graduating from this program can apply to enter the graduate program in development communication (extension) or rural sociology.

The graduate programs in rural sociology were created in 1975. Some of the students in this program come from the Center for Development Studies, which is located in the Social Economics Department complex on campus. The top students graduating from the extension and agricultural communication program are invited to join the center staff as assistant researchers on a year-long trial basis. Those research assistants who show promise for research work are invited to enter the rural sociology graduate program, in which they will conduct a year-long research project under one of the center's four major research programs. Rural sociologists from the senior staff of the Social Economics Department and the graduate program are heavily involved in conducting research through the center and supervise these graduate students. Students who excel in the graduate program and the center's research programs are invited to join the Social Economics Department teaching staff. This teacher/researcher "apprenticeship" program for the recruitment of highly qualified department staff was an innovation begun by the center. Other departments with related research centers are being encouraged to emulate this program.

Fewer public sector employees are sent by their agencies to the rural sociology graduate program than to the agricultural economics programs. A few employees from the Center for Agro-Economic Research are sent to study the role of rural institutions in agricultural production, marketing, and technology transfer. The Center for Research on Estate Crops, which is another branch of the Agency for Agricultural Research and Development (AARD), also has sent several people to this graduate program.

The graduate programs in agribusiness and resource economics are too new to have made any real impact. Basically, the new agribusiness program is being developed to meet the increased demands for improved management and financial skills among large-

scale commercial export and domestic food enterprises, food processing plants, and agricultural industries producing fertilizer, pesticide, and animal feed. Similarly, the resource economics program, which is still under development, will focus on more traditional agricultural and resource economics, with less of a business orientation.

Another major impact that the Department of Social Economics has had on education is the development of the graduate program in planning for regional and rural development, which was created in 1978 by the department's senior staff members. The idea for the program came from a staff member who had received his overseas graduate education in agricultural economics through an A.I.D.-sponsored program during the 1960s. According to this staff member, he and his colleagues had been advised by the IPB rector to continue their education so that they would be able to provide development planning assistance to BAPPEDA, the Provincial Planning Board. Many of the staff in the Social Economics Department who had been sent abroad for master's and Ph.D. degrees did come back to assist BAPPEDA offices in Java as part of their public service activities. However, the staff soon realized that BAPPEDA personnel lacked training and skills in program planning. Thus, the new graduate program was developed with the needs of BAPPEDA in mind. Today staff from BAPPEDA and many other government offices charged with planning are sent to pursue a master's degree in the planning for regional and rural development program. Indeed, the Office of Agricultural Planning in BAPPENAS, the National Planning Board, is dominated by graduates from this program.

Finally, the Department of Social Economics has had an impact on higher education in Indonesia through its graduate training of academic staff from other universities.

In summary, IPB's Department of Social Economics has had an impact on higher education in Indonesia through its graduates. These graduates, who are involved in policymaking, planning, management, and research, are contributing to Indonesia's educational needs in the economic and social aspects of agricultural and rural development.

3. RESEARCH

3.1 Introduction

The academic staff of the Department of Social Economics are actively involved in research. In the 1987/1988 academic year,

92 percent of the staff were involved in research. As with most of the other departments, a majority of the research is contracted by a Government agency or ministry or a donor agency. According to staff, research originated by the department or the staff is practically nonexistent, especially since funding from the university's central research institute ceased in 1985.

The department is often requested to investigate, evaluate, assess, or monitor various social, economic, and health issues related to Government programs. Department staff are also asked to join teams for donor-originated feasibility studies, evaluations, and the like. Frequent clients include the National Family Planning Board; the Ministries of Health, Agriculture, Transmigration, Population, and Environment; and the Directorate Generals of Cooperatives and of Animal Husbandry. Projects usually last from 6 to 24 months, with an average length of 12 months. Because the research is usually of an interdisciplinary nature, staff frequently request members of other academic departments to join them as team members.

A Government research contract begins with a request by one of the ministries to investigate a certain issue or program. It is the department staff, however, who develop the actual research program, its working hypotheses and methodology, and a list of participating team members, which they then submit as a research proposal.

According to the department chair, such research contracts are critical to institutional development. A number of staff have developed their master's or Ph.D. thesis as a result of their involvement as research team members. Younger team members also obtain valuable experience in field research methods and data collection and analysis, particularly if they work with more experienced staff members or expatriate researchers. Examples for course lectures are also derived from involvement in these research projects, which is an important consideration given the absence of up-to-date teaching materials and books.

As was stated in Section 2, department staff have always been active in advising public sector decision-makers and planners as part of their public service work. In addition, many public sector employees are graduates of the department and its related graduate programs. The department's reputation for having a well-educated staff and the staff's long-term, close ties with the Government as educators and advisers have combined to make the department a primary candidate for research contracts in development programs involving the social sciences.

Thus, for example, the Ministry of Health recently requested the department to conduct a 2-year investigation of village food

security. A prime reason cited for the award to IPB rather than to another university is the long and positive relationship the department has had with the Ministry. This relationship began in 1972 when senior staff members evaluated the Ministry's Family Nutrition Program to determine why it was not working and proposed an alternative approach. In 1975, the department received funding to test their proposed approach in a pilot project in a few selected poor rural villages in Java. Their program was successful in raising nutrition levels and infant body weights and became the foundation for the revised Family Nutrition Program. This project is but one of many impact and evaluation studies the department has conducted for the Government. The department often provides its research clients with program revisions or alternatives, which frequently influence Government policy.

3.2 The Department's Role in the Development of the Agro-Economics Survey

The Agro-Economics Survey (AES) was created in 1965 as a semi-independent research organization by an ad hoc interministerial organization in response to a decree of the Vice Premier of Economic Development. AES's original mandate was to assess Indonesia's agricultural resources and conditions in rural communities and to evaluate agricultural and agrarian policies. From the start, the Social Economics Department played a significant role in the development of AES because of the field survey experience of its trained rural sociologists.

The department has been a leader in coordinating many AES surveys throughout Indonesia in conjunction with other universities in Java, Sumatra, and Sulawesi. AES provided some of the first documentation on the impacts of the Green Revolution on Indonesian villages and rural populations. AES continued to monitor the impacts of Indonesia's rice intensification programs in its rice belt areas and made many recommendations concerning credit programs, technology introduction programs, and the like. Since 1975, AES's Rural Dynamics Study Series has been analyzing the effects on rural institutions of economic and social changes resulting from induced agricultural and rural development. Thus, AES has been crucial in providing in-depth evidence on the impacts of national planning on microeconomic and social conditions in Indonesia.

The relationship between the Social Economics Department and AES has been mutually beneficial. For example, AES has been extremely important to the development of the department by providing training and research experience for its staff and stu-

dents. Involved staff members have also benefited from the guidance, training, and active participation of expatriate researcher/teachers provided by the Agricultural Development Council and A.I.D.

Since the establishment in 1983 of AARD's Center for Agro-Economic Research (CAER), the once considerable impacts made by AES have become fewer. AES has lost half of its research staff to CAER, and funding levels from its long-term supporters, A.I.D. and the Agricultural Development Council, have been significantly reduced. However, CAER research topics are more concerned with macroeconomic issues than with social and microeconomic data. Obtaining social and microeconomic data remains a strength of AES, which, because of its nongovernmental funding sources, can afford to be more flexible in its choice of research topics and recommendations. As a semi-independent research organization, AES, with assistance provided by the Social Economics Department staff, provides a much needed independent voice and insight on Government agricultural policies and programs.

3.3 Impacts Through Research Publications

Department staff have published a substantial amount of material on their research efforts. The majority of these reports are published in Indonesian, although some are also published in English. However, insufficient funding for marketing and distribution is a major factor limiting the scope of the impact from these publications. The impact of the reports is further reduced because they rarely synthesize research data in any depth or relate the data to larger issues. Most of the publications are actually research reports for Government clients, and these apparently are not widely distributed.

The impacts of AES have been of greater significance than those of the Department of Social Economics. AES research findings have been published regularly with assistance from the Agricultural Development Council, and these volumes are widely used by national and international researchers. The National Agriculture Library in Bogor also has copies of these research volumes.

The Center for Development Studies also publishes research reports. The center publishes a monthly newsletter that highlights conclusions from center seminars and introduces research issues. Most of its publications report on research activities of the center's four research programs: (1) women in development, (2) social indicators, (3) human resources, and (4) farm management enterprises.

The center is currently planning to produce eight monographs detailing the results of research conducted in 12 provinces between 1981 and 1987 on the role of women in development. The goal of the overall study is to contribute to the identification of policies and programs at the national, regional, and local levels that can help resolve some of the problems constraining women's participation in development. The reports will consist of 24 case studies and a synthesis report detailing the overarching issues found in the case studies and presenting recommendations for changes in programs and policy.

A few of the professors on the department staff have published textbooks on agricultural economics, rural sociology, and women in development through Gadjah Mada University Press. Although these are important sources of undergraduate teaching materials, in general, few social science textbooks are published in Indonesian. Most staff members do not have time to write textbooks or case studies, and the majority of published materials originating from this department are findings from contract research.

It is perhaps appropriate to mention here the overall lack of library materials and texts for students enrolled in this department. The department maintains a small library, but it has few materials and many of these are out of date or in English--a situation mirrored in all IPB faculties.

4. PUBLIC SERVICE

All department staff members are involved in public service activities ranging from teaching in outreach programs in other universities to holding high-level positions in ministries. Five of the department's 11 full professors have been temporarily assigned to full-time administrative positions by the Government of Indonesia, and many more are active as part-time advisers to the various Government ministries, agencies, and boards. In these ways, the department continues to have an impact on policy and planning in Indonesia.

A 1977 department evaluation cited Indonesia's shortage of trained economists as a major reason for the high demand for staff services in Government planning and policymaking. For example, in 1977, 25 percent of Indonesia's economists with Ph.D. degrees and about 50 percent of its agricultural economists were at IPB. Although these figures have certainly changed over the past decade, the department's well-established relationship with the central government, in addition to its proximity to Jakarta,

has helped the department maintain a high level of public service.

Because the department contains one of the largest concentrations of graduate-trained rural sociologists and agricultural economists in the country, IPB and the Government have requested the department to become involved in outreach programs in other provinces. Staff members with graduate degrees (primarily the agricultural economists) regularly provide short-term assistance (2-4 weeks at a time) to the universities of Jambi, Lampung, Brawijaya, and others. These services include special short courses, seminars, and thesis supervision for graduate students.

5. PLANS FOR THE ESTABLISHMENT OF A FACULTY OF SOCIAL ECONOMICS

Given the department's large teaching staff, high enrollment, and varied undergraduate and graduate programs, the administration of IPB would like to merge all three social economics departments at the university into a single faculty. Thus, in 1983, IPB's rector requested the department to submit a plan for the development of a Faculty of Social Economics.

Some of the projected benefits of establishing a faculty are (1) greater planning autonomy for curriculum and staff development, (2) greater prestige for the social sciences as a program of study at IPB, and (3) greater possibilities of attracting research funds. A potential drawback is that the social science program would be less firmly anchored in agricultural sciences and interaction with those fields would be reduced because there is no mechanism for encouraging or allowing students to take courses outside their chosen faculty. Although department staff currently invite colleagues from other departments in the Faculty of Agriculture to join them in conducting contract research projects, if a separate faculty were created, extra efforts might have to be made to ensure that multidisciplinary activities continue.

One of the reasons that plans for the formation of such a faculty have not yet coalesced is the concern of the Social Economics Department staffs in the Faculties of Fisheries and Animal Sciences that their expertise in the technical disciplines within those faculties would suffer as a result of diminished interaction with other departments in those faculties. Curricula in the Faculties of Fisheries and Animal Sciences are more technically oriented and social science courses are fewer and more narrowly focused to support areas of technical specialization than they are in the Faculty of Agriculture. The department in the Faculty

of Agriculture is much less enmeshed in the technical agricultural sciences, and its students can major in the social sciences as soon as they enter the faculty in their second year. These students receive a fairly broad training in a wide range of social science theory and method courses and graduate as social scientists. Staff from the social economics departments of the Faculties of Fisheries and Animal Sciences believe that because of the technical nature of their programs, separate curricula of course offerings in the social sciences would be necessary if the departments of social sciences were consolidated in a new faculty.

6. CONCERNS FOR THE FUTURE

One of the most pressing concerns expressed in the Social Economics Department at the Faculty of Agriculture is with the quality of undergraduate education. Forty-four percent of the active teaching staff lack postgraduate training. The more educated the staff member, the more likely it is that he or she will be involved in substantial administrative duties on campus; teaching and supervising graduate students; research projects away from the campus; advising Government agencies, ministries, or national boards; and traveling to other universities to help them develop their graduate programs. With half the 11 full professors away on temporary assignment to public service on a full- or part-time basis, their classes must be taught by less educated and experienced staff. The better educated staff may be spending only one-third or less of their professional time in teaching and advising on campus.

Decisions concerning the allocation of staff time and plans for upgrading the staff are two major issues of concern in this department--in fact, for the majority of departments at IPB. Because of the rapid rise in student enrollments and the large number of staff with only undergraduate degrees, the department questions the practice of sending experienced staff to other universities to help improve the quality of their graduate training. A related concern is that the heavy public service and outreach commitments of many of the staff with advanced degrees will hurt the department's research programs.

Through staff development planning, the department hopes to exercise some control over these problems. Although somewhat limited, fellowships from the Ford Foundation are still available for sending young staff abroad for master's and Ph.D. degree training. Some postgraduate training abroad is available through the new Inter-University Center program, but the Social Economics Department has no scientific ties with any of the three centers

at IPB because the centers' work is not related to the social sciences.

In the past, A.I.D., through a contract with the University of Kentucky, and the Agricultural Development Council, with assistance from the Ford Foundation, were extremely important in providing staff fellowships for higher education. However, the University of Kentucky program did not include staff from the Social Economics Department because of a deliberate decision to emphasize the biological sciences. The Agricultural Development Council was expected to arrange for staff training for social scientists. In any case, funding for higher education from both sources has been declining.

Two major sources of funding for staff development remain: contracts for research projects from the Government of Indonesia and from international donors, which provide opportunities for staff to conduct thesis research. Course work is completed through IPB's own graduate degree programs, with small amounts of fellowship assistance from the Directorate General of Higher Education's Graduate Program Management Team. Thus, most staff are not only graduates of the department's own undergraduate programs, but they are also increasingly receiving their postgraduate training at IPB and conducting their thesis research on Government-requested topics. Such inbreeding may adversely affect the quality of the department's staff, particularly the development of critical thought--a quality important for teaching, research, and analysis in any field.

APPENDIX I

EXTENSION TRAINING AT BOGOR INSTITUTE OF AGRICULTURE

by Shakir Hussein

1. INTRODUCTION

The Faculties of Agriculture, Animal Sciences, Fisheries, and Forestry of the Bogor Institute of Agriculture (IPB) all have their own extension teaching staff, curriculum, and course requirements. In the Faculties of Agriculture, Livestock, and Fisheries, extension is a division of the Department of Social Economics. In the Faculty of Forestry, extension is taught in the Department of Forest Management. Only in the Faculty of Agriculture can students register to pursue studies for an undergraduate degree in (agricultural) extension.

2. COURSE REQUIREMENTS

Extension courses are required only in some of the departments of the Faculties of Fisheries and Forestry. In the Faculty of Fisheries, all students in the Department of Social Economics and Aquaculture are required to take an extension course; the three other departments do not require an introduction to extension. In the Faculty of Forestry, only students in Forest Management are exposed to the forestry extension course (Methods of Social Communication). Students in the Departments of Conservation of Forest Resources and Management of Forest Products are not required to take extension courses, even though some of their graduates work as forest conservation officers and reforestation officers with considerable extension education responsibilities.

The Faculty of Animal Sciences has a more comprehensive approach to extension training. Students in all departments are required to take two specified extension courses. In addition, students contemplating working in extension after graduation can take three additional extension courses in their final year, which enhances their employability as a subject matter specialist in the Ministry of Agriculture.

In the Faculty of Agriculture, besides students registered in the Division of Extension (Department of Social Economics), only students in the Departments of Plant Protection and Nutrition are required to take an extension course. Students in agronomy and soil science, for example, are not required to take any extension course even though some eventually work in the

Ministry of Agriculture as subject matter specialists in a predominantly agricultural extension position.

Students specializing in extension are required to take seven extension courses, six extension-related courses, five courses in general areas (e.g., human ecology, cooperatives, farm management, scientific writing), and six introductory technical courses (e.g., agronomy, climatology, soil science, food and nutrition, management, and plant protection). An accomplished student is likely to know a little of many subjects but have inadequate training and skills in all of them except extension.

The largest employer of extension personnel is the Ministry of Agriculture. Graduates with a bachelor's (S1) degree are normally employed as subject matter specialists at the district (kabupaten) and provincial levels. Those at the district level are required to have strong backgrounds in agricultural technology. Each of the 27 provinces has a position for a subject matter specialist in extension and positions for subject matter specialists in five other technical areas. Also the Agency for Agricultural Research and Development (AARD) employs teachers in extension at their agricultural high schools.

The majority of graduates in extension are unlikely to be employed in the Ministry of Agriculture because of their weak technical background. However, this may not be a serious problem if there are adequate employment opportunities in other areas (e.g., family planning, transportation, and banking). Unfortunately, data on the employment of extension graduates are unavailable. However, none of the several final-year students interviewed for this evaluation seemed worried about finding employment after graduation.

3. PRACTICAL TRAINING

The extent and quality of practical training in extension vary among the faculties. The Faculties of Fisheries and Forestry do not offer fieldwork in extension, whereas the Faculty of Animal Sciences offers practical extension training for students who elect extension as a program in their final year. In the Faculty of Agriculture, only students in the Division of Extension and Education receive practical extension training. However, all IPB students spend 2 months of their final year working in villages and thus experience some level of interaction with farmers.

Students pursuing a degree in extension spend several periods of varying duration (1 week, 2 weeks, 2 months) in villages

learning about village social, cultural, economic, nutritional, and sanitation practices. Practical exercises also involve collecting data for the development of an extension program and evaluating some ongoing extension programs in several fields (agriculture, health, transmigration, and so on). The students seem to be very confident about their ability to apply such training.

4. LIBRARY RESOURCES

Library resources on extension include some of the old U.S. texts, such as Cooperative Extension by Kelsey and Hearne and Getting Agriculture Moving by Mosher. However, other important classics in the field are unavailable. Unfortunately, a more serious problem than availability of reading materials is the students' inability to read English. Working through a text with a dictionary is very demanding. Only introductory texts on extension are available in the Indonesian language.

5. RESEARCH

The pioneering spirit of the 1960s at IPB seems to have faded not by design but by force of circumstances. Because of the shortage of university research funds, many staff members now undertake research on behalf of external agencies that determine the research questions or the problems to be investigated. Because these research activities often cover broadly divergent topics that do not complement each other, this research does not usually contribute to the generation of new theories, models, or systems. Also, many current research efforts are basically evaluative surveys, which do not require staff members to think out the problems or conceptualize strategies and theories in search of solutions, as did research projects in the past.

A significant impact from the earlier period was the achievements of IPB's "action research" in pursuit of strategies to increase farmers' productivity. The historical ineffectiveness of agricultural extension in helping to increase production motivated IPB to experiment with an innovative approach to agricultural extension in three villages in Krawang District, a major rice-producing area on the northern coast of Java. This experiment became known as the Krawang project. In 1963, 12 fourth- and fifth-year students of the university were sent to live in the villages and work closely with groups of 50 farmers each. Although these students were not experienced in extension or rice technology, their enthusiasm compensated for these deficiencies.

They instructed farmers on the more advanced techniques of rice cultivation, in the process carrying out demonstrations and quasi-experiments on farmers' plots. Working with small groups of farmers facilitated the development of close relationships between students and farmers, thereby evoking feelings of mutual trust and credibility and reducing the psychological distance between "teacher" and "learner." This combination of trust, credibility, close supervision, availability of needed materials, and continuous advice and encouragement motivated farmers to use the new recommendations.

The experiment was a great success. The yields obtained by farmers in the experiment were 50 percent higher than those obtained by other farmers. Impressed by this achievement, the Government of Indonesia funded an expansion of the project that included other universities, and eventually the Krawang approach was adopted as the national extension methodology of the Ministry of Agriculture and was given the name BIMAS (Mass Guidance).

Since then, staff research has continued but without the same results. Much of the research has concentrated on sociological issues or problems rather than on extension education. No research has been conducted by extension staff members on the Training and Visit system despite the general perception that this extension strategy has many problems that affect its success in the field.

Much of the research in the Division of Extension has been conducted by students for their thesis. This type of research covers a wide range of topics, including extension, village development, role of women, credit, marketing, supplies, family planning, nutrition, BIMAS, and so on. However, the majority of student research seems to concentrate on sociological issues and problems rather than on extension education issues and problems.

The results of student research need to be disseminated in order to make relevant agencies and policymakers aware of their findings. Because of the large number of such research projects, the best way to increase awareness of the Extension and Education Division's research activities and the utility of the findings might be a publication of research abstracts, which could be distributed to the relevant agencies.

APPENDIX J

THE PUBLIC SERVICE INSTITUTE OF BOGOR INSTITUTE OF AGRICULTURE

by Shakir Hussein

1. INTRODUCTION

Public service or service to society is an integral part of the tridharma philosophy of university education in Indonesia. Both staff and students are required to work outside the university on projects contributing to national development. The public service activities of most staff members consist of part-time consultancies or full-time staff assignments to ministries or to national, provincial, or regional development projects. Student public service projects are limited almost exclusively to the development of rural areas.

Public service provides a means for higher education to tangibly demonstrate its relevance to national development. Such work goes beyond theory to the practical application of the concepts and strategies taught in universities. Through public service, the relevance of university teaching to reality is continuously tested in practical situations, thus forcing improvements in curricula and refinements of theories and strategies for rural development.

This type of work and interaction with society was pioneered by the Bogor Institute of Agriculture (IPB) in the early 1960s, and was institutionalized through the creation of the Institute of Public Service in 1979. This institute, through its four centers (the Center for Regional Development, the Center for Community Education, the Center for Student Service, and the Center for Extension Services), assumed responsibility for coordinating most of the university's public service activities directly related to rural development.

2. STRUCTURE OF THE PUBLIC SERVICE INSTITUTE

The Institute of Public Service is directed by a chairman who has the same status as a university dean. The chairman is assisted by the heads of the four centers and by an advisory committee composed of at least one member from each faculty. Also, IPB faculty members are recruited to assist in implementing programs requiring their expertise. The institute chairman and the heads of the four centers work only part time in their public

service capacities; each is also a full-time member of a regular faculty.

3. THE CENTERS OF THE INSTITUTE OF PUBLIC SERVICE

3.1 Institute and Center Goals

Although each center of the Institute of Public Service has its specific responsibilities, center activities are consistent with the overall goals of the institute. Because of the centers' integrated approach to rural development efforts, center activities complement each other. This approach is inherent in the institute's goals, which are briefly described below:

- To cooperate with regional governments in the study, development, and implementation of new or improved strategies to more effectively achieve rural development
- To conduct action research in applied science and technology in order to produce proven models that would support development
- To promote, arrange, and conduct training in several professional fields at the central and local levels in order to equip development workers with needed skills
- To promote the development of leadership and provide extension and consultation in several professional fields at the central and local levels
- To coordinate the programs of student service to facilitate village development through the use of students' expertise and activities

The four centers work cooperatively on many of these activities. A prominent example is their cooperation in the ongoing action research to develop a model village. This program is testing a strategy which promotes simultaneous development of socioeconomic and cultural organizations and activities. The Center for Regional Development develops and tests planning strategies and trains village leaders in implementing the planning process. The Center for Extension and Service organizes farmer groups and provides agricultural technology and extension services. The Center for Community Education provides training in the formation and management of local organizations. The Center for Student Service coordinates the activities of students in order to provide villages with needed skills and leadership for the

continued development of these organizations and activities. A more detailed description of each center's activities and achievements follows.

3.2 Center for Regional Development

Consistent with IPB's pioneering thrust of the 1960s and long before the creation of the Center for Regional Development, IPB was experimenting with new strategies to accelerate the development of rural areas. IPB sought to increase the effectiveness of regional development by introducing the concept and practice of coordination and integration of development efforts. It introduced guidelines and trained officials at the district level in Sukabumi and supervised the implementation of this concept. For this purpose, IPB also promoted the organization of the Coordination, Integration, and Development Board (BAKIPDA).

As the concept was being implemented, IPB continued to monitor the impact and to work on perfecting the concept of an integrated and cooperative approach to development. Planning, rather than coordination, was discovered to be more important at the district level. As a result, coordination and integration were replaced by planning, and the organization responsible for its implementation was renamed the Development Planning Board (BAPEMKA). Coordination and integration were instituted at the village level, where the participation of local people in development activities and coordination of development efforts were emphasized. IPB continued to provide training for the efficient implementation of these concepts in six districts.

The success of the planning process promoted by IPB prompted the Government, with the help of IPB, to institutionalize regional development planning at the provincial and district levels throughout Indonesia. IPB also provided training and supervision for the successful implementation of this effort. This planning process is still being used in all provinces and districts, and IPB continues to provide training for its successful operation.

A more recent advance made by the center has been the development of a strategy based on central place theory to rationalize the introduction and expansion of services and support institutions in rural areas. This strategy is currently being promoted, but it has not yet been adopted, by regional and provincial governments.

3.3 Center for Extension and Service

While the Center for Regional Development works mainly at the district and provincial level, the Center for Extension and Service concentrates on village development. The Extension and Service Center conducts action research in search of strategies that would accelerate village economic development. It is currently involved in testing a strategy to promote agricultural development through the use of improved agricultural technology. In this experiment, the Center provides a group of farmers with all inputs (seeds, fertilizers, limestone, pesticides, and the like) free of cost, together with continuous advice and supervision on their correct use. Use of the technology is closely monitored and the results are carefully evaluated. The costs of inputs are used in determining the economic feasibility of the technology being promoted. Farmers' reactions to the technology are also obtained in the process. The Ministry of Agriculture does not practice this innovative approach to determine ecological adaptability, economic feasibility, and farmers' receptivity to new technology.

3.4 Center for Student Service

Student service is a practical exercise in rural development. Final-year students of IPB and all other national universities live in villages for a period of 2-3 months, employing their knowledge and skills to assist or accelerate village development. This national practice appears to have been a product of IPB's pioneering period of 1960s, when IPB first sent students to the villages to live and work with rice farmers to improve rice production. This service was institutionalized at IPB in 1975.

Since 1975, 9,372 students have participated in this program in hundreds of villages in 64 districts of 14 provinces. In 1984/1985 alone, 1,300 students assisted 261 villages. Assistance normally includes improving or developing all areas essential for development: village administration; compilation and analysis of statistical information; promotion of improved agricultural technology; formation and development of social, economic, and cultural organizations; mobilization of villages and promotion of their participation in development activities; stimulation of cultural expressions; and initiation of small economic enterprises.

This practice of student service has many benefits for the students, the villages, and the universities. Students gain

experience in solving practical socioeconomic problems in rural areas. They conduct analyses of the villages to help identify development needs and problems facing the villagers. They also have an opportunity to develop some skill in planning, developing, and implementing programs to meet the needs and alleviate the problems they have identified. This exercise helps the students to realize the complexity of the socioeconomic problems facing people in rural areas, as well as the difficulties involved in solving these problems. Students also become conscious of the limitations of their individual training. They come to realize the need for interdisciplinary approaches, thus enhancing their appreciation for other disciplines.

Most of the students at IPB come from cities and towns, so their concept of village life is usually narrow. Their exposure to the realities of poverty, malnutrition, inadequate or nonexistent facilities, unemployment and underemployment, lack of resources, and so on is usually an unforgettable educational experience that is likely to increase their understanding of the need for greater rural development efforts. Should they become policymakers or leaders, their decisions are likely to be grounded in this experience.

3.5 Center for Community Education and Training

The Center for Community Education and Training conducts training for leaders of community organizations and assists in the formation of some social and economic organizations. The training is aimed at improving the administrative and management aspects of the organizations and providing the skills necessary for undertaking and operating new enterprises. The center has conducted basic management training for leaders of women's organizations and assisted in the formation of cooperatives.

4. SUMMARY

The Institute of Public Service provides a valuable service to rural areas and to provincial and district centers. It has made significant contributions to regional development planning and to village development. Moreover, it has broadened students' perspectives on development needs and problems. But could it have made--or can it make--a bigger contribution? More specifically, is the student service program a useful exercise and could it be improved?

The Institute of Public Service has some weaknesses in staffing, programs, funding, and publicity. For example, the institute has no full-time professional staff. The chairman and the heads of the four centers are all full-time staff of other institutions, where they have regular teaching and research duties. The limited time available for public service constrains their efforts to plan, develop, and implement programs.

Lack of funding for most of the activities of the institute is another serious constraint. In some cases, meager contributions from donor agencies have been the only hope for continuing some programs.

Student service has proven to be a useful exercise for students, the villages, and the university. However, the program is inadequately financed. Students have to finance part of the costs and in many cases have to use their own funds to purchase the supplies needed to implement the programs that are developed. Students obviously are not enthusiastic about the prospect; thus programs can be seriously hampered. Without supplies, the villagers' participation in development activities is limited to theoretical training without any practical involvement. The villagers are not enthusiastic about this approach, either.

An even more serious problem is the "hit and run" approach of the program. A group of students is normally sent to one village for 2-3 months, too short a time for students to gain the trust of the villagers and establish their credibility. Much of the time is spent in problem/needs identification and planning and development of programs, which leaves very little time for program implementation. At the end of the 2-3 months, the students depart without having trained an adequate cadre of local leaders to continue the work. They do not return the next semester.

Such an approach is not conducive to the production of socioeconomic or technological change. It would be extremely useful if there were some continuity of efforts for a period of 2-3 years: One group of students would be replaced by another group after a short transition period. For this plan to work, some students would be required to do their public service in the seventh semester, some in the eighth semester, and some during their summer vacation.

Further evaluation of program impact in the field is needed. With some improvement in implementation of the student service program and some generous financial assistance, student service could demonstrate its potential for rural development in addition to its already obvious benefits to students and to the univer-

sity. Correspondingly, with some improvements in programming and financing, the other areas of the Public Service Institute can also realize their potential.

APPENDIX K

THE PUBLIC SERVICE INSTITUTE OF IPB

by Shakir Hussein

1. INTRODUCTION

Public service or service to society is an integral part of the "tridharma" philosophy of university education in Indonesia. It is obligatory for both staff and students and requires them to work outside of the university for some time on projects contributing to national development. The public service of most staff members takes the form of part time consultancy or full time staff assignments to national, provincial or regional development projects or regular subject ministries. Students, on the other hand, contribute their effort almost exclusively to the development of the rural areas. In both cases staff and students use their higher learning for the promotion of national development.

Public service provides a means for higher education to demonstrate tangibly its relevance to national development. It goes beyond theory to the practical application of concepts and strategies taught in universities. The appropriateness of their teaching to reality is continuously tested in practical situations and thus forces improvements in curricula and the refinement of theories and strategies for rural development.

This type of work and interaction with society was pioneered by IPB in the early sixties, and in 1979 was institutionalized by the creation of an Institute of Public Service. This Institute through its four centers assumed the role of leadership with responsibility for coordination of most of the university's public service activities. The consultancies and other activities of the university's staff members mentioned above are not coordinated by the Institute. All other activities directly related to rural development are.

2. STRUCTURE OF THE INSTITUTE OF PUBLIC SERVICE

The Institute is directed by a chairman who has the same status as a Dean in the university. He is assisted by the heads of the four centers and by an advisory committee made up of at least one member from each faculty. Also, staff members of regular faculties are recruited to assist in the implementation of programs requiring expertise not possessed by the Institute. Neither the chairman nor the heads of centers work full time in their positions at the institute. Each is a full time member of a regular faculty and only works part time in their public service capacity.

The structure of the Institute is shown in figure 1.

Fig. 1. Structure of the Public Service Institute of IPB.

3. THE CENTERS OF THE INSTITUTE OF PUBLIC SERVICE

3.1 Institute and Center Goods

Although each Center has its specific responsibilities, their activities are consistent with the overall roles of the Institute. The activities of the Centers also complement each other in their "integrated" rural development effort. This approach is inherent in the mandated roles of the institute which are briefly described:

- To cooperate with regional government in the study, development, and implementation of new or improved strategies in search of more effective ways to achieve rural development.
- To conduct action research in applied science and technology in order to produce proven models that would support development.
- To promote, arrange and conduct training in several professional fields at the central and local levels in order to equip development workers with needed skills.
- To promote the development of leadership and provide extension and consultation in several professional fields at the central and local levels.
- To coordinate the programs of student service to facilitate accelerated village development through the use of students' expertise and activities.

The four centers work cooperatively on many of these activities. A prominent example is their cooperation in the ongoing action research to develop a model village. This program is testing a strategy which promotes simultaneous development of socio-economic and cultural organizations and activities. The Center for Regional Development develops and tests planning strategies and also trains the village leaders in the implementation of the planning process. The Center for Extension and Service organizes farmer groups and provides agricultural technology and extension. The Center for Community Education provides training in formation and management of local organizations. The Center for Student Service coordinates the activities of the students to provide the village with needed skills and leadership for the continued development of these organizations and activities. A more detailed description of each Center's activities and achievements follows.

3.2 Center for Regional Development

Consistent with its pioneering thrust of the sixties and long before the creation of the Center for Regional Development, IPB was experimenting with new strategies to accelerate the development of the rural areas. It sought to increase the effectiveness of regional development by introducing the concept and practice of coordination and integration of development efforts. It introduced guidelines and trained officials at the regency level in Sukabumi and provided supervision in the implementation of this innovation. For this purpose it also promoted the organization of a Coordination, Integration and Development Board (BAKIPDA) with special responsibilities for implementation. As the concept was being implemented, IPB continued to monitor its impact and to work on its perfection. Planning rather than coordination was discovered to be more important at the regency level. As a result, coordination and integration was replaced by planning and the organization responsible for its implementation was renamed Development Planning Board (BAPEMKA). Coordination and integration were instituted at the village level where participation of local people in development activities and coordination of development efforts were emphasized. IPB continued to provide training for the efficient implementation of these concepts in six Regencies.

The success of the planning process promoted by IPB prompted the government to institutionalize regional development planning at the provincial and regency levels throughout Indonesia. This was done with the help of IPB. IPB also provided training and supervision for its successful implementation. This planning process is still being used in all provinces and regencies and IPB continues to provide training for its successful operation.

A more recent advance made by the Center has been the development of a strategy based on central place theory to rationalize the introduction and expansion of services and support-institutions in the rural areas. This strategy is presently being promoted but has not been adopted as yet by regional and provincial governments.

3.3 Center for Extension and Service

While the Center for Regional Development works mainly at the regency and provincial level, the Center for Extension and Service concentrates on village development. It conducts action research in search of strategies that would accelerate village economic development. It is presently involved in testing a strategy to promote agricultural development through the use of improved agricultural technology. In this experiment it provides a group of farmers with all inputs (seeds, fertilisers, limestone, pesticides, etc.) free of cost together with continuous advice and supervision on their correct use. The utilization of the technology is closely monitored and the results carefully evaluated. The costs of inputs are used in determining economic feasibility of the technology being promoted. Farmers' reactions to the technology are also obtained in the process. This is an innovative approach not practiced by the Ministry of Agriculture to determine ecological adaptability, economic feasibility and farmers' receptivity to the new technology.

3.4 Center for Student Service

Student service is a practical exercise whereby final year students of IPB and all other national universities live in villages for a period of time (two to three months) during which they employ their knowledge and skill to assist or accelerate village development. This national practice appears to have originated from IPB's innovative idea of the sixties when students were first sent to the villages to live and work with rice farmers to improve their rice production. This service was institutionalized at IPB in 1975.

Since 1975 a total of 9,372 students have participated in this program. They have operated in hundreds of villages in 64 regencies of 14 provinces. In 1984/85 alone 1300 students assisted 261 villages. Assistance normally includes improving or

developing all areas essential for development -- from village administration to compilation and analysis of statistical information, promotion of improved agricultural technology, formation and development of social, economic and cultural organizations, mobilization of villages and promotion of their participation in development activities, stimulation of cultural expressions, initiation of small economic enterprises, etc.

This practice has many benefits for the students, the villages, and the university. Students gain experience in solution of practical socio-economic problems in the rural areas. They conduct analyses of the villages to determine, among other things, development needs and problems facing the villagers. They also have an opportunity to develop some skill in planning, developing and implementing programs to alleviate or eliminate the needs and problems identified. This exercise helps the students to realize the complexity of the socio-economic problems and needs facing people in rural areas, and also the difficulty in solving these problems. They also become conscious of the limitations of their individual training. They realize and hopefully appreciate the need for interdisciplinary approaches and thus enhance their appreciation for other disciplines.

Most of the students at IPB originate from cities and towns and their concept of village life is usually very narrow. Their exposure to the realities of poverty, malnutrition, inadequate or absent facilities, unemployment and underemployment, lack of resources, etc. is usually an unforgettable educational experience which is likely to increase their appreciation for greater efforts to promote and achieve rural development. Should they become policy makers or leaders, their decisions are likely to be grounded in experience.

3.5 Center for Community Education and Training

This Center conducts training for leaders of community organizations and assists in the formation of some social and economic organizations. The training is aimed at improving the administrative and management aspects of the organizations and to

provide skills necessary for the undertaking and operation of new enterprises. It had conducted basic management training for leaders of womens' organizations and assisted in the formation of cooperatives.

4. SUMMARY

The Institute of Public Service provides a valuable service to the rural areas as well as to provincial and regency centers. It has made significant contributions in regional development planning and undoubtedly in village development. It has also broadened students' perspective of development needs and problems. However, could it have made, or can it make a bigger contribution? Further, with specific reference to student service, is it a useful exercise and could it be improved?

With respect to the Institute there are some weaknesses in staffing, programs, funding and publicity. There is no full-time professional staff in the Institute. The chairman and the four heads of centers are all full-time staff of regular facilities where they have their regular teaching and research duties. The limited time available for public service does constrain their planning, development and implementation of programs.

Lack of funding for most of the activities of the Institute is a serious constraint. In some cases meager contributions from donor agencies have been the only hope for programs continuation.

It has been shown that student service is a useful exercise for the students, the villages and the university. However, there is inadequate financing of the program. Students have to finance part of the costs and in many cases have to use their own funds to purchase supplies needed to implement the programs developed. Students obviously are not enthusiastic about the prospect and programs can be seriously hampered. Without the availability of supplies the villagers' participation in development activities is limited to theoretical training without any practical involvement. The villagers are not enthusiastic about this approach either.

A more serious problem is the "hit and run" approach used in the program. A group of students is normally sent to one village for 2 - 3 months. This time is too short to gain the trust of the villagers and establish credibility. Much of the time is often spent in problem/needs identification, planning and development of programs and very little is left for program implementation. At the very end of the 2 - 3 months the students depart without having trained an adequate cadre of local leaders to continue the work initiated. They do not return the next semester. This approach is not conducive to the production of socio-economic or technological changes. It would be extremely useful if there is some continuity of efforts for a period of 2-3 years. One group of students may be replaced by another group with a short transition period. For this to work some students may be required to do their public service in the 7th semester, some in the 8th semester, and some during their summer vacation.

Evaluation of program impact in the field is needed. With some improvement in implementation of the student service program, and some generous financial assistance, student service could demonstrate its potential for rural development besides its already obvious benefits to students and to the university. Correspondingly, with some improvements in programming and financing the other areas of the Public Service Institute can realize their potential.