

Indonesia

The Bogor Agricultural University (IPB) Development Project (II)

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Field survey: September 2004

## 1. Project Profile and Japan's ODA Loan



Project site location map



The newly-constructed Faculty of Agriculture building

### 1.1 Background

The predecessor to Bogor Agricultural University (IPB) was established in the early years of the twentieth century and while being one of the oldest universities in Indonesia it also offers the highest standards of agricultural education and research in the country. Its campus is located in the city of Bogor in West Java, a distance of some 60 kilometers from the capital, Jakarta, and since its inception, as Indonesia's center for agricultural education and research. IPB has produced human resources with specialist knowledge and skills, has provided refresher education programs for lecturers from the nation's universities and has advised on national agricultural policy. In 1994, when the project appraisal was conducted, IPB comprised seven faculties (agriculture, veterinary medicine, animal husbandry, fisheries and marine science, forestry, agricultural technology, and mathematics and natural sciences), and had a student body of 12,000 comprising non-degree (diploma), undergraduate, master's degree and doctoral students.

IPB has played a crucial role in the development of Indonesia's agriculture, but was facing quantitative and qualitative shortages of facilities, equipment and lecturers vis-à-vis student numbers, and was necessitated to improve the internal efficiency of education<sup>1</sup> and to enhance both its undergraduate and postgraduate programs. The master plan was conceived with the aim of consolidating university facilities, which were scattered across multiple campuses, within the Darmaga Campus situated some 12 kilometers outside the city of Bogor. On the basis of this master plan, the Japan Bank for

<sup>1</sup> This refers to the relationship between the inputs into (incoming students) and the outputs from (graduating students) an education system. It indicates the degree of efficiency with which students entering educational establishments graduate within the prescribed curricula framework.

International Cooperation (JBIC) implemented the Bogor Agricultural University Development Project (I) (approved in 1989); providing support primarily for the development of Faculty of Animal Husbandry and Faculty of Fisheries and Marine Sciences buildings on the Darmaga Campus and fellowship program for faculty staffs. This project is its successor.

## 1.2 Objectives

This project's objective was to improve the internal efficiency of education, make quantitative and qualitative improvements in postgraduate education, and strengthen research activities, through the development of Faculty of Agriculture and Faculty of Veterinary Medicine buildings and the implementation of a fellowship program for faculty staffs at Bogor Agricultural University (IPB) in West Java, thereby contribute to the development of Indonesia's agriculture by developing specialists and engineers in the fields of science and engineering, with a focus on agriculture, and promoting the efficient use of related knowledge and technologies in society.

## 1.3 Borrower/Executing Agency

The Republic of Indonesia/Directorate General of Higher Education (DGHE), Ministry of Education and Culture

## 1.4 Outline of Loan Agreement

Loan Amount/Disbursed Amount	7,716 million yen/6,935 million yen
Exchange of Notes/Loan Agreement	November 1994/November 1994
Terms and Conditions -Interest Rate -Repayment Period (Grace Period) -Procurement	2.6% 30 years (10 years) General Untied (consultant component: partially untied)
Final Disbursement Date	December 2002
Principal Contractors (Goods and Services)	Tokai Kogyo Co., Ltd., PT. WASKITA KARYA, PT. HUTAMA KARYA/Kajima Corporation
Principal Contractors (Consulting Services)	PT.JAYA CM MANGGALA PRATAMA/Pacific Consultants International/NISSOKEN Architects/Engineers Inc., PT. KOGAS DRIYAP CONSULTANT
Project Identification and Preparation Study (such as Feasibility Study (F/S))	1981: Government of Indonesia (Master Plan) 1989: Loan Agreement for Phase 1

## 2. Evaluation Results

### 2.1 Relevance

In view of the fact that the objectives of this project were consistent with Indonesian development policies and programs both at appraisal and at ex-post evaluation, thereby confirming the need for its implementation, the plans are considered highly relevant.

#### 2.1.1 Relevance of project plans at the time of appraisal

REPELITA VI (1994-1998), Indonesia's sixth five-year national development plan, advocated the promotion of science and technology as a means of promoting the nation's agricultural production and agro-industries. Moreover, the second long-term development framework for higher education (KPPT-JP 1986-1995) was focused on enhancing postgraduate education and reeducation programs for university lecturers at postgraduate schools, with the aim of improving the quality of education, including the field of agriculture.

This project was a high priority undertaking involving the development of educational and research facilities and the provision of support for lecturers in acquiring postgraduate qualifications of IPB, a center for agricultural education and research, and one of the top academic establishments in Indonesia.

#### 2.1.2 Relevance of project plans at the time of ex-post evaluation

PROPENAS (2000-2004), Indonesia's national development plan, called for the promotion of the nation's agricultural production and agro-industries based on the promotion of science and technology and on technological innovation. In higher education program, the third long-term development framework for higher education (KPPT-JP 1996-2005) aims to ensure equal opportunity in education and increase contributions of education to society, and take a policy for granting legal autonomy to universities, in addition to the improvement in quality of education including agricultural study, that was worked on in the second development framework.

The objectives of this project are consistent with these policies and programs. The importance of IPB in developing human resources and undertaking research in the field of agriculture remained high at the time of ex-post evaluation, thereby confirming the necessity for this project.

### 2.2 Efficiency

Despite some delays in project implementation, actual outputs and costs were satisfactory in relation to the original plans, and the efficiency of project implementation

is thus broadly judged to have been high.

### 2.2.1 Outputs

The outputs planned at the time of appraisal are detailed below.

- (1) Building construction work: Construction of buildings for Faculty of Agriculture, Faculty of Veterinary Medicine and the Veterinary Teaching Hospital on the Darmaga Campus (total: 78,000m<sup>2</sup>).
- (2) Procurement of equipment/furniture: Procurement of furniture for the two faculties aforementioned and of educational and research equipment for the same two faculties and for the Faculty of Mathematics and Natural Sciences<sup>2</sup>.
- (3) Fellowship program: Support for 22 lecturers in the Faculty of Agriculture and Faculty of Veterinary Medicine to study abroad for the acquisition of master's degrees and/or doctorates.
- (4) Consulting services: engineering services (ES): 1,708 man months (M/M); project management services (PMS): 862 M/M; academic fellowship services<sup>3</sup>.
- (5) Technical assistance: Dispatch of equipment selection specialists (1 M/M) and equipment utilization specialists (7 M/M).

ODA loan covered all the foreign currency costs incurred in the implementation of the aforementioned outputs and some of the local currency costs.

Actual outputs were as follows. Comparison between the IPB-developed master plan and the actual outputs of Phase 1 and Phase 2 (this project) of the project are shown in Table 1.

- (1) Building construction work: Almost as planned; buildings for the two faculties and the Veterinary Teaching Hospital were constructed. The total floor area of buildings constructed was 83,800m<sup>2</sup>, or 106% of the initial plans.
- (2) Procurement of equipment/furniture: Provision was in line with the original plans. As detailed in "2.2.2 Project Period", the initially prepared equipment list become outdated by delays in project implementation necessitating re-selection and resulting in a 40% modification of the spec contained in the original list.
- (3) Fellowship program: As planned; 22 lecturers, eleven from the faculty of agriculture and eleven from the faculty of veterinary medicine, acquired postgraduate qualifications (master's/doctoral degrees) at universities in Japan or in other foreign countries<sup>4</sup>.

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<sup>2</sup> Construction of a new building for the Faculty of Mathematics and Natural Science is in progress under funding from the Indonesian government and IPB.

<sup>3</sup> Due to the small scale of the academic fellowship services, this component was not planned in terms of man months but as a lump-sum contract equivalent to 10% of the overseas study costs.

<sup>4</sup> One lecturer from the faculty of agriculture acquired both a master's degree and a doctorate, the remainder acquired doctorates. The countries where the lectures acquired the degrees were as follows: eight lecturers

(4) Consulting services: Due to delays in implementation, ES amounted to 2,691 M/M (158% of the initial plans) and PMS to 1,571 M/M (182%). Academic fellowship services were provided as planned.

(5) Technical assistance: As planned, the equipment selection specialist dispatch amounted to 1 M/M. The plan to dispatch equipment utilization specialists had to be canceled because of the upcoming L/A closing, another consequence of the delays in implementation. The instruction on operating the procured equipment was provided by lecturers with experience in the use of the equipment and through training provided by the manufacturers.

Table 1: IPB Master Plan Achievements

Faculty	Master Plan Achievements (New buildings on the Darmaga Campus)
Agriculture	Completed under Phase 2 project
Veterinary Medicine	Completed under Phase 2 project
Fisheries and Marine Science	Completed under Phase 1 project
Animal Husbandry	Completed under Phase 1
Forestry	Not started yet
Agricultural Technology	Completed using Indonesian government funds
Mathematics and Natural Science	Under construction by IPB
Economics and Management	Not started yet
General Basic Courses	Not started yet
Administrative bureau	Completed under Phase 1 project

Source : IPB

Figure 1: Several of the project outputs



New faculty of veterinary medicine bldg.



Veterinary Teaching Hospital



Laboratory equipment procured for existing facility of faculty of mathematics and natural science

### 2.2.2 Project Period

The project period planned at the time of appraisal was 74 months, or from November 1994 through January 2001. Actual project period was 100 months, or from November 1994 to March 2003 that was equivalent to 135% of the original plans.

According to the report received from IPB, the delays were mainly attributable to (1)

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from the faculty of agriculture studied in Japan, two in Malaysia and one in the US; ten lecturers from the faculty of veterinary medicine studied in Japan and one studied at a Philippine university.

delay in the consultant selection process, (2) delay in building construction work (consequent upon the price fluctuations that accompanied Indonesia's economic crisis in the late 1990s, which caused delays in determining construction equipment prices), and (3) delay in equipment procurement (re-tender due to outdated the initial equipment list caused by delay in construction work). Efforts to avoid further delays were apparently attempted, by shortening the equipment procurement process, for example.

### 2.2.3 Project Costs

Actual total project costs amounted to 7,145 million yen against a planned cost of 9,078 million. The lower project cost is considered attributable to the depreciation of the local currency (Rupiah), which exceeded inflation, and to competitive bidding, which enabled cost-effective ordering.

### 2.3 Effectiveness

This project's objectives can be three points as follows: (1) to improve the internal efficiency of education, (2) to make quantitative and qualitative improvements in postgraduate education, and (3) to strengthen research activities at IPB. Based on information collected during the study, the improvements that have been made in all three points generally surpass the original targets and project objectives are thus considered to have been achieved.

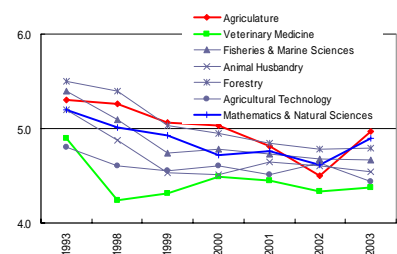
Given that, of the three faculties procured equipment, the other project is being implemented in the faculty of mathematics and natural sciences<sup>5</sup>, and that all three faculties have obtained funds from other sources and are encouraging their lecturing staff to obtain postgraduate qualifications, it is inferred that these other projects are also contributing to the effects detailed below.

#### 2.3.1 Improvements in the internal efficiency of education

##### (1) Shortenings of years to graduation<sup>6</sup>

The prescribed academic terms from entrance to graduation are four years for undergraduate programs and two years for master's programs. Looking at the performance of students in the faculties covered by this project, average years to graduation for the cohort of

Figure 2: No. of years to graduation (faculty average)



Source: IPB

<sup>5</sup> While this project was in progress, the World Bank was funding a project that involved the provision of equipment for undergraduate programs.

<sup>6</sup> The rate of repetition is frequently used as a representative indicator of educational internal efficiency, but since it was not possible to obtain sufficient data to utilize this parameter during the field survey, the number of years to graduation was used alternatively.

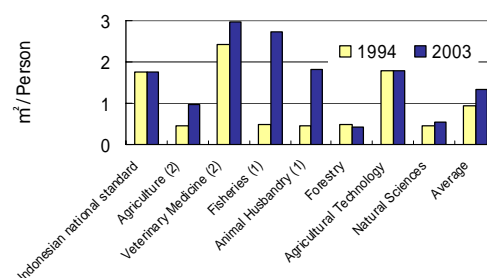
students that graduated in 1993 were as follows: agriculture: 5.3 years, veterinary medicine: 4.9 years, mathematics and natural sciences: 5.2 years (all being undergraduate programs), while the average for master's programs was 2.2 years; in 2003, there had been reductions in all the figures as follows: agriculture: 5.0 years, veterinary medicine: 4.4 years, mathematics and natural sciences: 4.9 years (all being undergraduate programs), while the average for the master's cohort was 2.1 years. Given that the numbers of entrance, of enrolled students and of graduates all increased beyond projections cited in the IPB-developed master plan (revised in 1992), it may be concluded that more students are graduating in shorter periods of time<sup>7</sup>.

As evidenced in Figure 2, the figures for individual faculties fluctuate year on year, but since 2000 when the new agriculture and veterinary faculty buildings were completed, the reductions in number of years to graduation in these two faculties have been slightly greater than those seen in other faculties. Given that the procurement of equipment for the new buildings was not completed until 2003, it will take several more years before the causal relationship between this project and the number of years to graduation can be fully investigated.

## (2) Increased floorage per student

The floor area of educational and research facilities vis-à-vis student numbers was studied, as this being one of the promotional factors for improvements in internal efficiency. Post-project, the floor area of classrooms per student in all faculties covered by this and the Phase 1 project had increased. In the two faculties covered by the building construction component of this project, the floor area increased from 0.5m<sup>2</sup> to 1.0m<sup>2</sup> in the faculty of agriculture and from 2.4m<sup>2</sup> to 3.0m<sup>2</sup> in the faculty of veterinary medicine. However, reflecting the surge in student numbers in the faculty of agriculture, the floorage of classrooms has yet to meet the Indonesian national standard (INS), i.e. 1.5-2.0m<sup>2</sup><sup>8</sup>.

Figure 3: Per student floorage



Source: IPB

Note: A (1) after the faculty name indicates that it was covered by the Phase 1 project, and a (2) that it was covered by the Phase 2 project.

<sup>7</sup> In 2003, there were 14,225 undergraduates and 5,786 graduate students enrolled at IPB, while 2,718 undergraduates and 830 postgraduates graduated that year. Between 1993 and 2003 the dropout rate fluctuated at around 1-3% of active students, and was showing signs of rising. In passing, the dropout rate is also on the rise at public universities in Japan and findings from a 1998 survey showed it to be around 1.7% (it had dropped to around 1.2% in 1990).

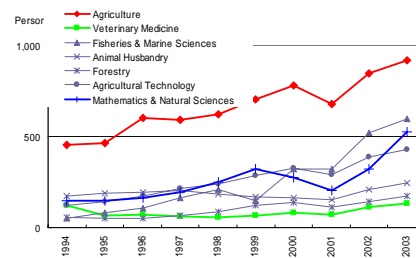
<sup>8</sup> For reference, asked to provide information on the floor area of classrooms in the agriculture and veterinary medicine faculties, a representative national agricultural university in Japan gave the figure of 4.2m<sup>2</sup>/student.

### 2.3.2 Quantitative and Qualitative Improvements in Postgraduate Education

#### (1) Increased numbers of postgraduate students

The numbers of postgraduate students enrolled in all faculties are on the increase. Between 1993 and 2000, the university's master plan called for the following increases in the numbers of postgraduate students enrolled on either master's or doctorate programs in the faculties covered by this project: faculty of agriculture: 455 to 730, faculty of veterinary medicine: 120 to 280, and faculty of mathematics and natural sciences: 148 to 370. Against these targets, with the exclusion of the faculty of veterinary medicine, which had a postgraduate cohort of 132 students, in 2003 postgraduate numbers in the agriculture and mathematics and natural sciences faculties had risen above the projections (agriculture: 920, sciences 525). Even in the faculty of veterinary medicine, although the numbers of postgraduate students in 2003 was fewer than that of in 1994, it was the largest number since 1995.

Figure 4: No. of students on master's degree/doctoral programs

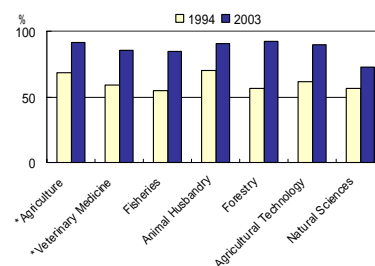


Source: IPB

#### (2) Higher ratio of lecturers holding master's degrees and/or doctorates

IPB was aiming to increase the ratio of lecturers with master's degrees and/or doctorates from their 1993 levels of 69% in the faculty of agriculture, 59% in the faculty of veterinary medicine and 57% in the faculty of mathematics and natural sciences, to an inter-faculty average of 70% by 2000. Against this, in 2003 the figure for the faculty of agriculture was 92%, for the faculty of veterinary medicine 86% and for the faculty of mathematics and natural sciences 73%, i.e. the ratios had all increased beyond the target figure. In the faculties covered by the project's fellowship program, more than half the respective teaching bodies now hold doctorates: 53% in the faculty of agriculture, 50% in the faculty of veterinary medicine<sup>9</sup>. The Indonesian government's policy not to increase lecturer numbers means that the total number of lecturers employed by IPB has decreased slightly from 1,288 in 1994 to 1,251 in 2003.

Figure 5: Percentage of lecturers with master/doctoral degrees



Source: IPB

Note: Asterisks indicate faculties covered by the foreign study program

As to the extent of project contribution to postgraduate degree acquisition among

<sup>9</sup> The only other faculty with a rate exceeding 50% is the faculty of agriculture technology (55%), which was targeted for technical cooperation by the Japan International Cooperation Agency (JICA).



lecturers, of those lecturers obtaining doctorates during the period covered by the project (80 in the faculty of agriculture, 13 in the faculty of veterinary medicine), 14% of lecturers in the former and 85% in the latter participated in the project-funded fellowship program.

### (3) Increased number of graduate study programs

Between 1994 and 2003, the number of master's and doctoral study programs offered by the faculty of agriculture increased from nine to fourteen, by the faculty of veterinary medicine from six to seven and by the faculty of mathematics and natural sciences from five to six. These three were the only faculties to introduce new study programs during this period, and all were established in 2003, after the completion of project facilities<sup>10</sup>. This suggests that the construction of new buildings and the provision of laboratory equipment have encouraged IPB to offer new research areas.

### (4) Provision of opportunities for clinical training

The Veterinary Teaching Hospital that was constructed as part of this project is providing faculty students with opportunities to receive clinical training, and postgraduate students are participating in actual diagnostic activities on a rotational basis. Clinical training was formerly provided in the small veterinary clinic on the Bogor City Campus, but since it is now possible to breed animals (including large animals such as cows and horses) in the stables that were constructed under the project, students now have increased opportunity to receive clinical training. Moreover, the provision of endoscopic diagnosis equipment, surgical equipment for large animals, cameras and monitors for observing procedures and operations, and the development of observation rooms, means that it is now feasible to provide clinical training in more advanced techniques.

Figure 6: Postgraduates in the midst of diagnosis activities



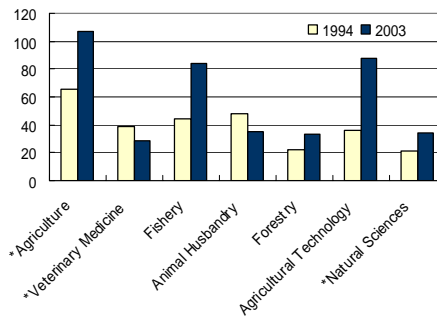
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<sup>10</sup> The combined numbers of undergraduate and postgraduate study programs (undergraduate study programs equate to departments) increased in all three faculties between 1994 and 2003: in the faculty of agriculture from 19 to 29, in the faculty of veterinary medicine from 7 to 9, and in the faculty of mathematics and natural sciences from 13 to 14. All new subjects were established after the completion of project facilities.

### 2.3.3 Strengthening of Research Activities

The number of research activities being undertaken by IPB (including both “researches” involving either basic or applied research and “public service activities”<sup>11</sup>, results from which are applied and/or disseminated in society by IPB) increased from 276 in 1994 to 410 in 2003<sup>12</sup>. This includes joint projects and funded research involving more than thirty private companies, suggesting that research activities at IPB are being built

Figure 7: No. of research activities at IPB



Source: IPB

Note: Asterisks indicate faculties covered by the project

up, thereby enabling the university to make a direct contribution to society through applied research and the provision of services. As regards the faculties covered by this project, research activities in the agricultural and veterinary medicine faculties respectively increased from 66 to 107 and from 21 to 34 during the same period. The overall number of research activities being undertaken by the faculty of veterinary medicine is on the decline, but during the field survey a faculty lecturer explained that the expansions of research facilities have made it possible to undertake a wider variety of research, and that there are plans to implement more projects in the future.

The medical services now being provided by the Veterinary Teaching Hospital, although they are not counted in the aforementioned research activities, may be said to represent one of the direct contributions being made to society by university-produced knowledge<sup>13</sup>. The number of diagnoses made at the hospital increased from 240 in 2003 to 669 in 2004 (through September)<sup>14</sup>. Of these, the number of referrals from other hospitals climbed from 120 in 2003 to 352 in 2004 (through September), suggesting that the hospital is functioning as an advanced medical facility (referral hospital).

Some of the equipment procured for the hospital (endoscopic diagnosis equipment, surgical equipment for large animals, etc.) has yet to be fully utilized in research and clinical activities. According to hospital staff, this is because there are few opportunities to perform the diagnoses that require this equipment and the hospital technicians have yet to fully master the techniques required to operate some of the apparatus (see “2.5

<sup>11</sup> Public service projects indicate consulting and promotional/training activities that are delivered directly to the general public or to the business community; for example, IPB is studying/promoting improved crop varieties and growing methods, and providing related training.

<sup>12</sup> This number indicates the research activities that are being implemented via the IPB administration bureau and does not include those being carried out independently by the faculties/departments.

<sup>13</sup> It is believed that some research activities based on clinical practice are being carried out at the Veterinary Teaching Hospital, but it was not possible to confirm the numbers.

<sup>14</sup> The establishment of a sub-clinic in downtown Bogor in 2004 served to increase the number of diagnoses, and, as already mentioned, to increase the opportunities for students to receive clinical training (for details, see “2.3.2 Quantitative and Qualitative Improvements in Postgraduate Education”).

Sustainability”). However, this equipment is scarce in Indonesia, thus the potential exists to improve the quality of IPB both as a core university and as a referral hospital.

### 2.3.4 Internal Rates of Return

The internal rate of return was not calculated at appraisal, but for the purposes of this evaluation, an attempt was made to calculate the economic internal rate of return (EIRR). Including costs as (1) project costs and operation and maintenance costs, and (2) future earnings from students who did not enter the workforce after graduating from high school and/or university but went on to university and/or graduate school, and benefits as (1) wage growth resulting from larger numbers of graduates, (2) wage increases stemming from longer periods spent in employment (i.e. the reduction in number of years to graduation), and (3) savings on educational expenses stemming from longer periods spent in employment, yielded an EIRR of 1.2%<sup>15</sup>.

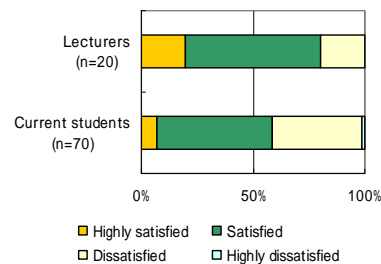
### 2.3.5 Use of/Satisfaction with Facilities (Beneficiary Survey)

As part of the field survey, beneficiary survey was undertaken regarding the use of and satisfaction with IPB facilities; it covered 20 IPB lecturers, 71 current students and 10 lecturers from other universities<sup>16</sup>.

Firstly, asked to name three pieces of educational and/or research equipment that they used on a regular basis, the total of 91 lecturers and current students from IPB named

microscopes (61 people), computers (35 people), LCD projectors (19 people), spectrophotometers (17 people) and various other devices, citing a total 606 different

Figure 8: Satisfaction with IPB Facilities



Source: Beneficiary Survey

<sup>15</sup> Regarding benefits, only those directly attributable to the project (wage increases and savings in educational expenses among the students who benefited directly from the project) for which information could be obtained during the field survey were factored into the calculation. Some research quantifies indirect benefits (external effects), i.e. the ripple effects generated in society by university-educated individuals (direct beneficiaries), and factors these into IRR calculations, but due to difficulties in identifying and quantifying these indicators they were not employed for this calculation. The low EIRR is conceivably explained by (1) delays in implementation which aggravated the effects of inflation and the worsening exchange rate at the end of the 1990s, pushing up project costs on a local currency basis when calculated taking 2003 (project completion) as the base year, and on the benefit side, (2) by the limitations on the indicators that could be factored into the benefit calculation as quantifiable effects, and (3) by the fact that since considerable improvements had already been effected in the number of years required to graduate prior to the completion of this project, the wage increment that could be factored into the benefit calculations for this project was minimal.

<sup>16</sup> The breakdown of the respondents is as follows. Lecturers: 9 from agriculture, 5 from veterinary medicine and 6 from the mathematics and natural sciences faculty. Current students: 30 from agriculture, 20 from veterinary medicine and 21 from the mathematics and natural sciences faculty. Other university lecturers: Gadjah Madah University (UGM); 5 from the faculty of agriculture and 5 from the faculty of veterinary medicine.

items. On use frequency, 17.6% stated that they use the equipment daily, 58.5% that they use it at least once a week. During observations conducted during the field survey it was confirmed that microscopes, centrifuges, measuring apparatus and lab equipment was being used by students for practical training.

As to satisfaction with the facilities, 80% of IPB lecturers and 57.7% of current students (valid responses were received from 70 students) stated that they were satisfied. Reasons given for dissatisfaction with the facilities included the failure of some equipment, limited use opportunities and insufficient quantities of equipment (for details on the current status of equipment and resources, see “2.5 Sustainability”).

## 2.4 Impact

The higher objective of this project was to contribute to development in the agriculture sector through human resource development and the development and dissemination of technologies. As detailed above, IPB has been offering the highest standards of education and research, predominantly in agricultural sciences, in Indonesia for many years, and many of its graduates are leading figures in national development<sup>17</sup>; moreover, the knowledge of its human resources and the outcomes of its research have been and continue to be applied in governmental and business circles. The qualitative improvements in education and research that were effectuated by this project are considered to have encouraged IPB to make further contributions to agricultural development.

### 2.4.1 Developing the human resources that will play leading roles in agriculture, veterinary medicine and natural sciences

Graduates from IPB’s baccalaureate programs are employed in educational and/or research institutes, in other public sector organizations and in the private sector<sup>18</sup>. According to records available at evaluation, the number of “other”, which includes those graduates whose career paths are unknown, has increased over pre-project levels, and comparatively fewer are seeking jobs in educational/research institutes and public-sector organizations. By contrast, the percentage of those completing postgraduate programs who choose to become lecturers has remained above 60%.

Since the facilities and equipment development under this project was completed in 2003, it is still too early to ascertain what the post-graduation activities of its

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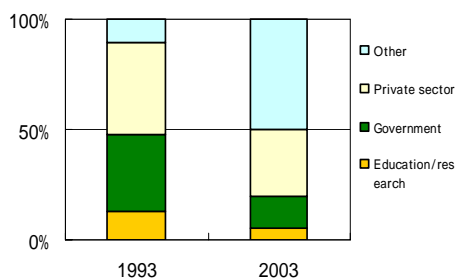
<sup>17</sup> The ministers of agriculture, forestry and industry incumbent at evaluation are all former IPB students.

<sup>18</sup> It was not possible to obtain statistics on how many baccalaureate graduates went on to study for postgraduate degrees but IPB states that number of job-finders includes some who entered graduate school after finding employment (in Indonesia, many people study for postgraduate degrees using grants/subsidies provided by their companies).

beneficiaries. In view of the fact that IPB was producing graduates who now occupy leading roles in society before this project was implemented, the activities of future graduates may be expected to continue playing a central role in related sectors.

The graduate school at IPB has served as a place for refresher education and the acquisition of academic qualifications. In 1993, 85% of students enrolled on master's degree programs at IPB and 68% of its doctorate students were working adults, but the university reports that both figures hit 100% in 2003<sup>19</sup>. Furthermore, 78% of students enrolled on master's degree programs and 63% of those on doctorate programs are lecturers at other universities, which suggest that IPB is contributing to qualitative improvements in the education and research being provided at other universities through its refresher education programs.

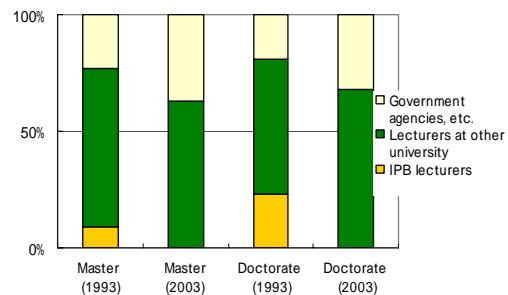
Figure 9: Career paths of baccalaureate graduates  
(Average for agriculture, veterinary medicine, science faculties)



Source: IPB

Note: "Other" includes unknown career choices, but no breakdown is available.

Figure 10: Career paths of MSc/PhD graduates



Source: IPB

#### 2.4.2 Utilization of research results in society

At the time of evaluation, several joint research projects involving external organizations and private companies utilizing facilities developed under the project have just started and it is expected that the results will be put to practical use in the future. As an example of an up-and-running project, there is a meat processor, a joint venture between IPB and an Indonesian food company, and IPB knowledge is being utilized in the development and introduction of quality control technologies<sup>20</sup>. IPB has also concluded a contract concerning the project for development and commercialization of animal vaccines by the joint venture with a Japanese pharmaceutical company, and it is scheduled to start in a short time.

<sup>19</sup> Of these, 5-10% are self-funded, 5-10% are receiving government scholarships and the remainder are being funded by the organizations to which they are affiliated.

<sup>20</sup> This project is providing veterinary medicine faculty students with opportunities to receive practical training.

### 2.4.3 Environmental Impacts

IPB reports that the waste being generated on campus is being appropriately disposed of. Effluent from the laboratories is being treated in the neutralizing tank that was installed as part of this project, and other wastewater is being treated at wastewater treatment facilities and then discharged into rivers. The laboratory animals used by the faculty of veterinary medicine are being cremated in the incinerator that was built under the project. Solid waste is being disposed of at the landfill designated by the local authority. There have been no specific reports of environmental pollution following the completion of this project.

The Darmaga Campus on which the project buildings were constructed had already been requisitioned as a site for IPB development when the master plan was drawn up and there was thus no need to acquire additional land.

## 2.5 Sustainability

At the time of evaluation, there were no specific problems with the operation and maintenance systems being employed for facilities at IPB, and in view of the fact that all facilities are currently in good condition. Thus, the sustainability of project effects is considered to be high.

### 2.5.1 Executing Agency

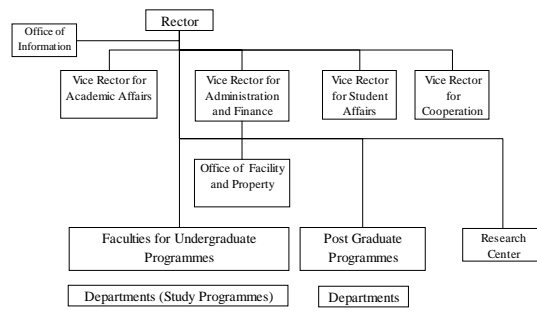
#### 2.5.1.1 Technical Capacity

The operation and maintenance of facilities and equipment that were developed for the use of the IPB community is the responsibility of the administrative bureau, that of individual faculty facilities and equipment of the respective faculties (or departments). The techniques for operating sophisticated laboratory equipment have broadly been mastered thanks to training provided by the suppliers and instruction from lecturers who have returned from overseas studies. As mentioned earlier, it was explained that since some of the advanced diagnostic equipment that was supplied to the Veterinary Teaching Hospital is used infrequently, hospital technicians have not yet fully mastered the necessary operational techniques.

### 2.5.1.2 Operation and Maintenance System

IPB, along with three other national universities<sup>21</sup>, was accredited as a separate legal entity in 2000. Its budgetary and institutional autonomy has increased as a result. The Project Implementation Unit (PIU), which was responsible for the IPB development project, is pursuing development work on the basis of the master plan and in close liaison with the administrative bureau (run by the vice president of university resources). Documents obtained from IPB and hearings from the IPB suggest that the monitoring and consolidation of information relating to university facilities and to project effects is being properly collected from the concerned departments.

Figure 11: IPB Organizational Chart



Source: IPB

### 2.5.1.3 Financial Status

IPB's budget comprises subsidies received from the Indonesian government, tuition fees, revenues from research activities, and funds raised by the university in the form of donations, etc. In 2004, its total budget was Rp. 282.3 billion, an increase of approximately 1.3 fold over its budget for the preceding year (Rp. 221.6 billion)<sup>22</sup>. IPB has been working to increase university revenues since gaining autonomy in 2000 and the ratio of government subsidies to its overall budget is decreasing, from 41% in 2003 to 38% in 2004. The administrative bureau is strengthening its ties with the private sector in a bid to increase facility usage and to raise revenues.

The operation and maintenance budget for facilities and equipment has almost doubled, from Rp. 5.6 billion in 2003 to 11.5 billion in 2004, and according to IPB estimates, it is sufficient to cover the necessary operation and maintenance costs (Rp. 8.2 billion annually for all university buildings). By contrast, according to hearings from individual departments, allocations from the university budget for the operation and maintenance of educational and research equipment are not sufficient, the shortfalls are being made up through independent departmental efforts<sup>23</sup>.

<sup>21</sup> The other three are University of Indonesia (UM), Bandung Institute of Technology (ITB) and Gadjah Madah University (UGM).

<sup>22</sup> Inflation for 2004 was forecast at 6.5% meaning that this represents a real budgetary increase.

<sup>23</sup> Revenue generated by research projects/social service projects is allocated to the university, to the faculties and to the departments in fixed proportions. The departments collect fees from companies and perform various tests under contract, with the revenues therefrom being spent on operation and maintenance.

### 2.5.2 Operation and Maintenance Status

When the field survey was conducted, there was no evidence of any major problems with the operation and maintenance status of facilities and equipment that were developed via this project. Although some equipment in the faculty of mathematics and natural sciences has not been repaired after breaking down due to excessive use, it was explained that the problem can be dealt with by replacing low-cost parts. The administrative bureau maintains a list of all equipment owned by the various laboratories.

## 3. Feedback

### 3.1 Lessons Learned

Since sophisticated laboratory equipment quickly becomes outdated, on projects that implement procurement of such equipment together with building construction work, particular attention must be paid to coordination between the equipment selection/tendering process and progress in construction work, and efforts need to be made to ensure that equipment with the appropriate specifications is installed promptly right after building work is completed for effective utilization.

### 3.2 Recommendations

[To the executing agency] It is desired that IPB consider measures to promote utilization of equipment (the sophisticated laboratory equipment belonging to the Veterinary Teaching Hospital, etc.) that is in short supply in Indonesia in order to maximize the effects and impact of developments through research and the dissemination of results produced there from.



### Comparison of Original and Actual Output

Item	Planned	Actual
(1) Outputs		
1. Building construction	Construction of faculty of agriculture, veterinary medicine and related buildings; Veterinary Teaching Hospital (Total: 78,000m <sup>2</sup> )	almost as planned (Total: 83,800m <sup>2</sup> )
2. Equipment procurement	Provision of educational/research equipment for agriculture, veterinary medicine and mathematics and natural sciences faculties	Distributed as planned. Spec was subject to a 40% modification vis-à-vis the original plans.
3. Fellowship program	Total: 22 lecturers	As planned
4. Consulting services		
1) ES	1,708MM	2,691MM
2) PMS	862MM	1,571MM
3) Academic fellowship services	Lump-sum contract (10% of overseas study program costs)	As planned
5. Technical assistance	Equipment selection specialists: 1MM Equipment utilization specialists: 7MM	Equipment selection specialists: as planned Equipment utilization specialists: not dispatched
(2) Project period		
1. Loan agreement	Oct. 1994	Nov. 1994
2. Consultant selection	Jul. 1994 – Jun. 1995	Jun. 1995 – Feb. 1996
3. Building construction		
1) Bidding	Dec. 1995 – Jul. 1997	Aug. 1996 – Jul. 1997
2) Work	Aug. 1998 – Jul. 1999	Jul. 1997 – Aug. 2000
4. Equipment procurement		
1) Bidding	Feb. 1997 – Aug. 1998	Jul. 1997 – Jul. 2002
2) Procurement	Sept. 1998 – Nov. 1999	Jul. 2002 – Mar. 2003
5. Furniture procurement		
1) Bidding	Feb. 1997 – Aug. 1998	Jul. 1997 – Jul. 2001
2) Procurement	Sept. 1998 – Jul. 1999	Jul. 2001 – Jan. 2002
6. Fellowship program	Sept. 1995 – Aug. 2000	Jul. 1995 – Mar. 2003
7. Technical assistance	May 1995	Apr. – Jun. 1995

	Feb. – Mar. 2000	
(3) Project costs		
Foreign currency	3,563 million yen	2,864 million yen
Local currency	6,145 million yen	4,283 million yen
	(110,302 million Rp)	(279,542 million Rp)
Total	9,078 million yen	7,147 million yen
ODA loan portion	7,716 million yen	6,928 million yen
Exchange rate	1 Rp = 0.05 yen	1 Rp = 0.015 yen
	(as of April 1994)	(average for 1994-2003)