

Ex-Post Evaluation of Japanese ODA Loan Project
“Gadjah Mada University Development Project”

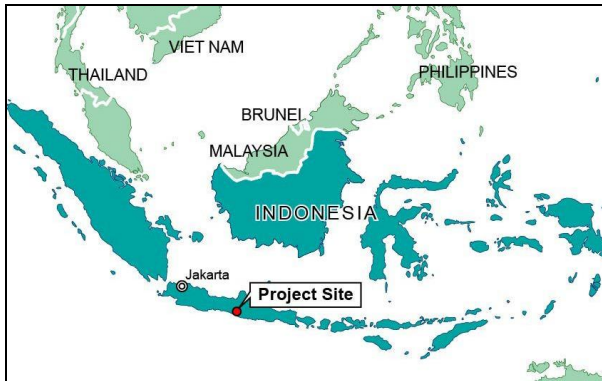
External Evaluator: Naomi Murayama, OPMAC Corporation

0. Summary

The Project objective was to develop high-quality human resources through improving the internal efficiency (shortening years from enrollment to graduation) and the education and research activities quantitatively and qualitatively by supporting development of Gadjah Mada University. This objective has been highly relevant to the country’s development plan, development needs, as well as Japan’s ODA policy; therefore its relevance is high. The building construction, the equipment procurement and the fellowship program were essentially completed in line with the initial plans, and the project cost was within the plan. However, the project period was extended for two years; therefore efficiency of the Project is fair. Based on the information gathered during this evaluation work, the Project has achieved its objectives or has shown a trend toward improvement regarding all the indicators of the internal efficiency of education, and quantitative and qualitative improvement of education and research activities, which were set at the time of appraisal; therefore its effectiveness is high. However, since some problems have been observed in terms of structural aspects, namely the operation and maintenance regulation/ system is not properly implemented, and technical aspects such as difficulties in repairs of the procured equipment, sustainability of the project effect is fair.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project Location



Gadjah Mada University

1.1 Background

Gadjah Mada University (hereinafter referred to as UGM) in Jogjakarta, Indonesia, is one of the key universities for education and research activities in Indonesia. UGM also places emphasis on contribution to local community. That is why UGM is a model school for other universities in Indonesia. UGM has played an important role in producing quality graduates who meet social needs especially in the fields of medicine and agriculture.

At the time of appraisal, development of high-quality human resources was required for industrialization in Indonesia. In addition, demand far exceeding supply was expected especially in the fields of medicine and agriculture. Under this circumstance, UGM had a plan to expand education and research activities quantitatively and qualitatively as one of the core higher education institutions in order to correspond to the social needs.

It was expected to develop high-quality human resources in the fields of medicine and agriculture as well as to make an impact on the entire higher education in Indonesia through implementation of the Project.

1.2 Project Outline

The objective of this project was to improve the education and research activities quantitatively and qualitatively in UGM, Indonesia by developing the buildings and the equipment and strengthening the teaching staff in the faculties of medicine and agriculture, thereby contributing to development of regional and national economy through supplying high-quality human resources to governmental organizations and private enterprises.

Loan Approved Amount/ Disbursed Amount	7,499 million yen / 6,479 million yen
Exchange of Notes Date/ Loan Agreement Signing Date	January, 1998 / January, 1998
Terms and Conditions	Interest Rate: 2.7 % (Consulting service: 2.3%) Repayment Period: 30 years (Grace Period: 10 years) Conditions for Procurement: General untied
Borrower / Executing Agencies	The Republic of Indonesia/ DG of Higher Education, Ministry of National Education (DGHE) and Gadjah Mada University (UGM)
Final Disbursement Date	February, 2009
Main Contractor (Over 1 billion yen)	PT. Pembangunan Perumahan (Indonesia), PT. Wijaya Karya (Indonesia), PT. Adhi Karya (Indonesia)
Main Consultant (Over 100 million yen)	PT. Duta Hari Murthi (Indonesia), PT. Cakra Manggilingan Jaya (Indonesia) /Kerta Gana (Indonesia)/ Pacific Consultants International (Japan) (JV)
Feasibility Studies, etc.	“Implementation Program” DGHE and UGM, August, 1996

2. Outline of the Evaluation Study

2.1 External Evaluator

Naomi Murayama, OPMAC Corporation

2.2 Duration of Evaluation Study

Duration of the Study: December, 2010 – October, 2011

Duration of the Field Study: March 19 – April 3, 2011, May 22 – May 28, 2011

2.3 Constraints during the Evaluation Study

There were some constraints on data availabilities making it difficult to compare the data between appraisal and ex-post evaluation and to consider the transition of data. In particular, UGM's statistical data prior to 2005 such as number of students are not available because they have not been computerized and properly stored. Furthermore, the premises of calculation for baseline data and targets set at the time of appraisal are unknown at this time.

3. Results of the Evaluation (Overall Rating: B¹)

3.1 Relevance (Rating: ③²)

3.1.1 Relevance with the Development Plan of Indonesia

Regarding higher education, Repelita VI (1994-1998), Indonesia's sixth five-year national development plan, aimed at increasing the percentage of science major students, especially engineers, from 14% to 25% of total students for the duration of Repelita VI by intensively strengthening the faculties of science at universities in order to realize education appropriate to the societal demand. Regionally, it put a priority on universities located in eastern regions of Indonesia. Therefore, at the time of appraisal, it met the national development plan to enforce the fields of science in higher education in eastern region of Indonesia.

In PRJM (2010-2014), the national development plan at the time of ex-post evaluation, education is cited as the second priority issue out of 11 issues. It says that "education development directly contributes to the achievement of economic development by being conducted along with measures for creation of job opportunities and entrepreneurs and against challenge of labour demand". Moreover, it strives to enhance higher education in order to develop human resources with leadership and in order to promote economic development. According to DG of Higher Education Ministry of National Education (hereinafter referred to as DGHE), they put emphasis on human development in the fields of science, technology, vocational training and agriculture, especially agricultural economics and agribusiness, even today. Therefore, the objective of the Project is still consistent with the development policy at the time of ex-post evaluation.

3.1.2 Relevance with the Development Needs of Indonesia

At the time of appraisal, since severe shortfalls in human resources in the fields of medicine and agriculture are pointed out in Indonesia, it was necessary to develop the faculties of medicine and agriculture in universities. At the time of ex-post evaluation, it is difficult to identify which faculties need support based on the statistics because it is not possible to obtain the excess and deficiency data disaggregated on human resources by academic field. It can be said in general, however, that development needs for higher education are growing more than before for the following reasons. Table 1 shows that graduates from primary education and secondary education have been increasing for nearly a decade. In addition, it is aimed to increase gross enrollment rate of higher education from 18%³ in 2009 to 25% in 2014 in PRJM (2010-2014).

Table 1: Transition of gross enrollment rate in Indonesia

		Unit: %		
age \ year	year	2003	2006	2009
7-12		96.4	97.39	97.95
13-15		81.0	84.08	85.43
16-18		51.0	53.92	55.05
19-24		11.7	11.38	12.66

Source: BPS, Statistik Pendidikan, 2003, 2006, and 2009

Furthermore, as the economy steadily grows in Indonesia, households can afford to increase their children's educational expenditure. Thus the number of students going on to universities is expected to increase. In light of the above, it is assumed that there are still development needs for higher education.

¹ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

² ③: High, ②: Fair, ①: Low

³ This is not consistent with the figures in Table 1 due to the different sources.

3.1.3 Relevance with Japan's ODA Policy

Japan's Official Development Assistance (hereinafter referred to as ODA) Charter in 1992 stressed that Japan was tied closely to Asian countries historically, geographically, politically and economically and put priorities on support to the Asian region. It also focused on human development and research collaboration for improvement and promotion of technology. The project objective was consistent with Japan's ODA policy at the time of appraisal.

This project has been highly relevant to the country's development plan, development needs, as well as Japan's ODA policy; therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The Project is composed of construction of buildings for faculties of medicine and agriculture⁴, procurement of education and research equipment, fellowship program (degree program and non-degree program of UGM lecturers in Japan), and technical assistance and consulting services for smooth project implementation. The outputs of each component are as shown in Table 2.



Building (Faculty of Forestry)

Table 2: Comparison of Outputs (planned and actual)

	Planned	Actual
① Construction of buildings and infrastructure development for seven faculties		
Gross floor area	68,000 m ²	86,180 m ²
Infrastructure development	Land development and utilities	Access road, landscape development, fence, parking area and additional facilities (power supply, water supply, firefighting and electrical distribution systems)
② Procurement of education and research equipment		
Quantity of procured equipment	1,058	2,433
Quantity of procured furniture	22,308	26,689
③ Academic fellowship program		
Degree program	20 persons	25 persons
Non-degree training	15 persons	16 persons
④ Technical assistance		
Selection of equipment	7.5 MM	2.47 MM
Selection of fellows	4.0 MM	0.00 MM
⑤ Consulting services		
Engineering services	440 MM	776.05 MM
Project management services	327 MM	505 MM
Fellowship services	73 MM	79 MM

Source: JICA appraisal documents, Responses to the questionnaire

⁴ Targeted faculties of the Project are seven faculties as follows: Faculty of Medicine, Faculty of Dentistry, Faculty of Forestry, Faculty of Agriculture, Faculty of Agricultural Technology, Faculty of Veterinary Medicine, and Faculty of Animal Husbandry.

The project outputs were slightly added and/or modified from the plan depending on components. Regarding construction of buildings for seven faculties, the gross floor area of buildings and the related space increased by 18,180 m² because of wider lobby area for student waiting, additional greenhouse and warehouse space and so on. In regard to infrastructure development, access roads, power supply facilities and the chemical waste water treatment facilities etc. were added for smooth and efficient operation of other components of the Project. In respect of procurement of academic equipment, some equipment was additionally procured because the planned equipment was not sufficient for research and education especially in Faculty of Agriculture, Faculty of Agriculture Technology and Faculty of Forestry. Some furniture was also added as Package F1 in response to the addition of buildings. As to fellowship program, since more degree holders and teaching staff with the latest academic knowledge were needed in order to accelerate the UGM's plan of Center of Excellence in Science and Technology Development, six fellows were added. The technical assistance experts for selection of fellows were not hired because the consultant for fellowship services dealt with the selection work and the workload was increased. The workloads of other consulting services, engineering services and project management services, were increased due to extension of the project period. In any case, these additions and modifications were acceptable as the planned components were modified with JICA's concurrence.

3.2.2 Project Inputs

3.2.2.1 Project Cost

Actual project costs amounted to 7,702 million yen (of this, the actual loan disbursement amounted to 6,479 million yen) against the estimated costs of 9,998 million yen (of this, the planned loan amounted to 6,479 million yen), and were lower than planned. The reasons for the lower project cost were attributable to the depreciation of local currency which exceeded inflation and to competitive bidding which enabled cost-effective ordering.

3.2.2.2 Project Period

The project period planned at the time of appraisal, which was defined as the period from signing of the Loan Agreement to the final disbursement, was 108 months, or from November 1997 to February 2007. The actual project period was 132 months, or from January 1998 to February 2009, which was equivalent to 122% of the original plan, and was slightly longer than planned. The main reasons for the longer project period were as follows:

- 1) As the Java earthquake that occurred on May 27, 2006 during implementation of the Project caused damage to buildings and equipment supported by the Project, the project period was extended for two years in view of the period needed for restoration and exchange of damaged items, and
- 2) The procurement of some additional equipment, Package F1, was delayed for two years later than planned because it took more time for the procurement procedure than planned and for getting the export permit for some equipment from the Japanese government.

In regard to reason 1), it could not be avoided since the earthquake was an unforeseen natural disaster. The first handing-over of the restoration package, added after the earthquake, was completed in October 2008 on time. On the other hand, Package F1 (the second reason) was added before the earthquake and basically was not affected by the disaster. The main reason was to take time for the procurement procedure. Although tenders were invited in 2006 and two companies bided, both did not meet the requirements; therefore the rebidding was conducted. In addition, it took time to get the export permit for some equipment as mentioned above. Consequently, Package F1 could not be also completed by the time set after the rebidding (December 2008).

All the procurement of equipment included in the original plan was completed within the

planned period.

Although the project cost was within the plan, the project period slightly exceeded the plan; therefore efficiency of the Project was fair.

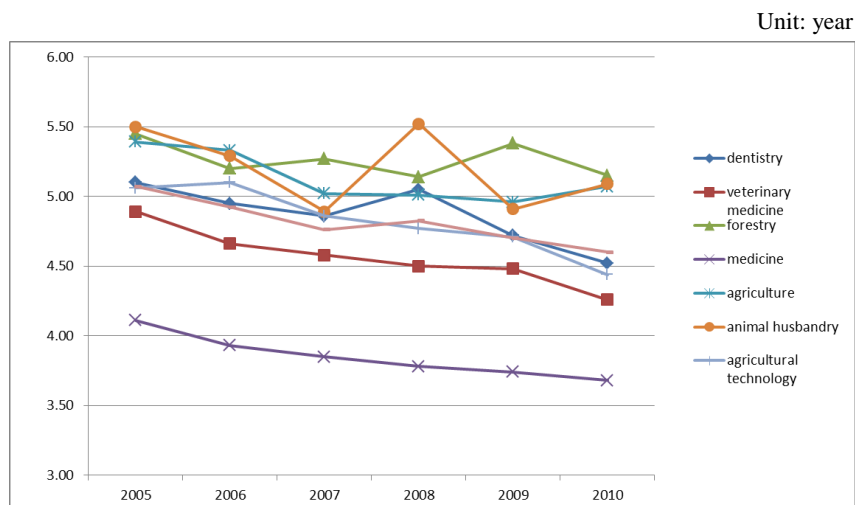
3.3 Effectiveness (Rating: ③)

3.3.1 Quantitative Effects

3.3.1.1 Results from Operation and Effect Indicators

(1) Internal Efficiency of Education

There are several indicators for internal efficiency of education. The number of years from enrollment to graduation is utilized as an indicator in this evaluation since it is possible to obtain the baseline data before the implementation of the Project. The prescribed years from enrollment to graduation are four years in UGM.⁵ The average years from enrollment to graduation were 5.5 years in the faculties of medicine and 6.7 years in the agricultural faculties before the implementation of the Project. It was targeted to graduate within five years on average in every faculty by 2005. As the Project was not completed as of 2005, the average number of years from enrollment to graduation in the agricultural faculties was 5.35 years and was still more than five years. On the other hand, Faculty of Medicine and Faculty of Veterinary Medicine already achieved the target and the average numbers of years were 4.11 years and 4.89 years in 2005, respectively. At the time of ex-post evaluation, it was 4.15 years in the medical faculties and 4.94 years in the agricultural faculties. These are dramatically improved as shortened by 1.35 years in the medical faculties and by 1.76 years in the agricultural faculties.



Source: Responses to the questionnaire (UGM)

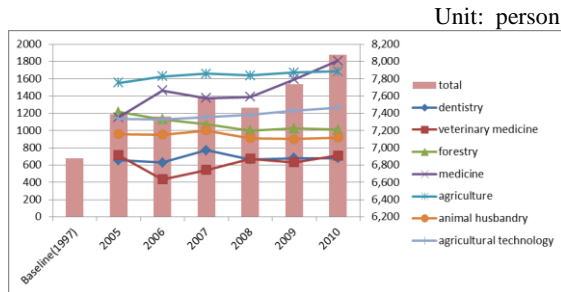
Figure 1: Numbers of years to graduation (Average in each faculty)

The main reason for shortening the duration from enrollment to graduation is considered that the laboratory equipment and clinical training instruments procured by the Project made it possible to reduce student waiting time for the equipment and to make education and research more efficient.

⁵ Regardless of the prescribed years, students have been able to graduate in a shorter time if they can get the required credits since mid-1990s.

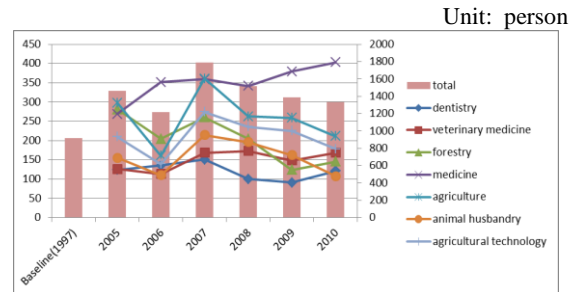
(2) Quantitative Improvement of Education: Increase of Number of Students and Graduates

In order to confirm quantitative improvement of education by development of buildings and educational facilities, the numbers of students and graduates, which had been set as indicators at the time of appraisal, were analyzed.⁶



Source: JICA appraisal documents, Responses to the questionnaire

Figure 2: Transition in number of registered students in 7 faculties



Source: JICA appraisal documents, Responses to the questionnaire

Figure 3: Transition in number of graduates in 7 faculties

Table 3: Transition in number of dropouts in 7 faculties

Year	Baseline (1996/97)	2005	2006	2007	2008	2009	2010
dropout	23	25	45	33	10	1	1

Source: JICA appraisal documents, Responses to the questionnaire

The total number of registered students in seven faculties has been increasing since 2005 and reached as many as 8,106 in 2010. This is attributed to expansion of admissions by setting up new departments in the faculties. Although total number of graduates in seven faculties increased from 915 in 1996/97 to 1,334 in 2010, the number has been decreasing in faculties other than Faculty of Medicine and Faculty of Veterinary Medicine especially since 2007. The total number has been decreasing year by year, too. The number of dropouts has been decreasing since 2007, and it was only one in total in 2009 and 2010, respectively (Table 3). Considering that the number of registered students in the faculties other than Faculty of Forestry, Faculty of Animal Husbandry and Faculty of Dentistry is increasing and the number of years to graduation in each faculty is shortening, it is very difficult to explain the decrease in the total number of graduates, in particular the decrease in the number of graduates in Faculty of Agriculture based on these figures. The data on number of graduates submitted by UGM might not be reliable in view of UGM's data archiving and interviews with all relevant persons who explained that the number of students and graduates is supposed to increase. In order to monitor the project effect and to manage the university properly, it is necessary to improve the data archiving on numbers of registered students and graduates.

At any rate, the development of buildings (86,180 m²) in seven faculties and equipment allows UGM to accept more students than before implementation of the Project. The Project contributed to quantitative improvement of education, namely increase in registered students, to certain extent.

⁶ The basis for calculation of the baseline data and the target are unknown and it was not possible to reconfirm the number of students as of 1997 during the site survey because of data archiving problems in UGM. Therefore, the analysis was attempted based on recent transition, but not in comparison with the target.

(3) Qualitative Improvement of Education

In this section, the ratio of lecturers with master's/ doctorate degrees, which was available data during the site survey, was considered and improvement of their education/ research abilities was confirmed in order to analyze qualitative improvement of education quantitatively. In addition, the degree of improvement of students' performance was confirmed based on the Grade Point Average (hereinafter referred to as GPA)⁷ which is generally used as an indicator for performance in Indonesia.

As of 2010, 100% or close to 100% of lecturers in the faculties except for Faculty of Forestry took master's/ doctorate degrees. The lecturers with master's or doctorate degrees increased drastically compared to the time of appraisal (Table 4).

Even in Faculty of Forestry which has the least degree holders, it increased by approximately 6% or from 68.91% in 1997 to 75.28% in 2010. This resulted from UGM's active encouragement to take degrees as the Center of Excellence in Science and Technology Development. Many lecturers completed degrees with assistance from international donors such as Germany. Considering this in relation to the Project, it is assumed that the Project made a contribution to qualitative improvement of UGM's education because all the participants in the degree program (25 lecturers) completed degrees in Japan.

GPA, an indicator of students' performance, has been improving in the seven faculties. The average GPA in the seven faculties improved by 0.1 points or from 3.04 points in 2005 to 3.14 points in 2010. It is considered that improvement of lecturers' quality by the fellowship program as well as development of buildings and equipment contributed to better students' GPA in the seven faculties to some extent.

(4) Improvement of Research Level

In order to analyze improvement of research level quantitatively, the research activities in the fields of medicine and agriculture (number of research papers⁸) and number of awarded research funds were confirmed during the site survey.

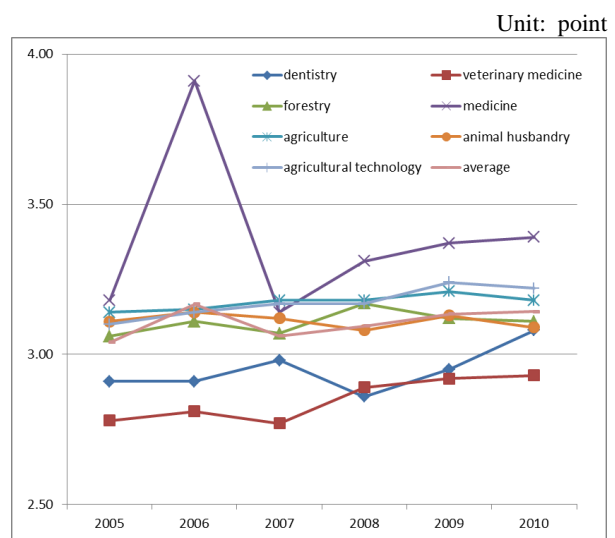
Referring to Table 5, the number of research papers which were produced by the lecturers

Table 4: Ratio of lecturers with degrees

Unit: %

faculty \ year	1997	2010
Medicine	53.49	98.68
Dentistry	58.97	100.00
Forestry	68.91	75.28
Agriculture	63.35	96.00
Agricultural technology	82.22	98.80
Veterinary medicine	67.31	100.00
Animal husbandry	80.77	94.59

Source: UGM



Source: UGM

Figure 4: Transition of GPA in 7 faculties

⁷ Students' performance is assessed by 5-level rating system (A, B, C, D and E) and by the Absolute Evaluation System. GPA is calculated as follows: Firstly, the performance assessment is converted into grade point (in the case of UGM, A= 4, B=3, C=2, D=1, E=0 (failing score)). Secondly, each grade point is multiplied by the number of registered credits. Finally, the average grade point is calculated by dividing total grade point by the number of courses.

⁸ Research papers in this evaluation are not limited to those put in SCI (Science Citation Index) and EI (Engineering Index) which are utilized as international evaluation criteria of research level.

in the seven faculties has annually been increasing from 128, or the baseline in 1997, to 687 in 2010. The number exponentially increased before and after the implementation of the Project.

Table 5: Number of research papers produced by lecturers in 7 faculties

Year	1997	2005	2006	2007	2008	2009	2010
Number of research papers in 7 faculties	128	311	332	408	429	523	687
(ref.) Number of lecturers in 7 faculties	n/a	862	834	801	788	784	771

Source: UGM

On the other hand, the total number of the research papers produced by 40 lecturers who participated in the fellowship program⁹ was 18 in 2010, which is equivalent to 0.45 per lecturer. This is about half of the number of per lecturer research papers in seven faculties, 0.89 in 2010¹⁰. Nevertheless, many participants in the focus group interview (the lecturers who studied in Japan under the Project), as mentioned later, expressed that the research projects or collaborative research with other universities in Indonesia/ foreign universities including Japan have increased by improvement of their facilities. It is presumed that the smaller number of the research papers at this moment is because the participants in the fellowship program are composed of relatively young lecturers. Generally speaking, it needs time to bear fruits in education projects. The number of research papers produced by the lecturers is expected to increase given the fellowship support by the Project.

Table 6: Number of funded research projects

Year	1997	2010
Number of research projects	n/a	160

Source: UGM

In regard to the awarded research funds, it is impossible to compare the performance before and after the Project because the data in 1997 is not available. However, it can be seen that UGM gets a lot of funded research projects in 2010¹¹.

Therefore, it can be considered that development of buildings and equipment contributes to enforcement of research activities in UGM to some extent although it is too soon to judge the performance of research abilities of young lecturers who participated in the fellowship program.

3.3.1.2 Results of Calculations of Internal Rates of Return (IRR)

Due to the fact that data needed for quantitative analysis was not available, analysis for the internal rate of return was not possible.

⁹ The lecturers who studied in Japan under the Project were 41 in total. However, as one lecturer of this passed away five years ago, this lecturer was not included in the figures in compiling the data.

¹⁰ This number comes from UGM's official responses to the questionnaire. According to UGM's other survey, however, the total number of the research papers was at least 149 by 13 JICA ex-fellows (the performance of remaining ex-fellows is unknown). Supposing the remaining 27 lecturers have not written any papers, the figure would be 0.62 per lecturer. The annual average of these 13 lecturers is 1.9 per lecturer.

¹¹ For example, according to the ex-post evaluation report of "Development Project of the Institute of Technology in Bandung (II)" the research activities were 234 in 2003. Of this, there were contracted researches or collaborative researches with about 60 private companies. Although it cannot be compared simply with other projects which are different in view of kinds and numbers of faculties assisted by projects and the definition of contracted research, the number of contracted projects in UGM is assumed to be quite a lot compared to the number of contracted projects in the Institute of Technology in Bandung if it is defined as the number of researches with these 60 private companies.

3.3.2 Qualitative Effects

3.3.2.1 Satisfaction with Facilities (Beneficiary Survey)

During the site survey, the questionnaire survey targeted at 74 lecturers and 137 students in the seven faculties was conducted in order to confirm their satisfaction with facilities and project effect.

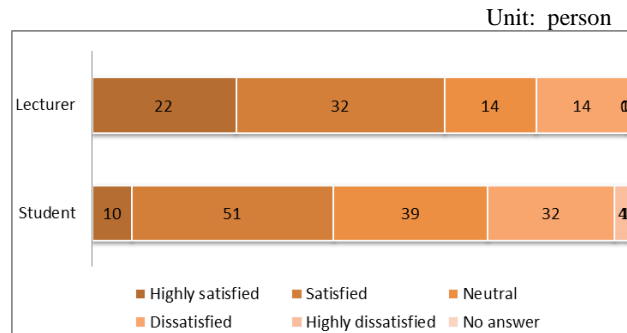
According to the results of the questionnaire survey of students, a key factor in choosing the university is that UGM has more advanced facilities than other universities in Indonesia. Many students are satisfied with the Project outputs and are grateful for them (61 students or about 45% of 137 students are satisfied with the equipment and 26% are unsatisfied). On the other hand, after they start attending university, 65% of students are inconvenienced by waiting for the experimental equipment due to the shortage of facilities. The low operating rate of equipment causes the queue for the equipment although shortage of equipment is also one of causes in some laboratories. The low operation rate is due to breakdown caused by lack of maintenance and aging equipment, and due to inefficient utilization by the scattered placement.

Lecturers are also satisfied with facilities. About 73% of the respondents answered “satisfied” to the questionnaire. Even some lecturers who marked “satisfied” expressed their dissatisfaction with defectives, breakdown, impossibility of repairs and shortage of equipment as well as mismatch between their needs and allocated equipment. Both lecturers and students are highly satisfied with buildings constructed by the Project.

Regarding convenient facilities and unnecessary facilities, the majority of respondents highly appreciate the research equipment and buildings which they utilize every day, but 16 out of 74 respondents (21.6%) answered that there are unnecessary items among the equipment allocated to their laboratories. Of this, many respondents gave reasons why the equipment was not suitable for the needs of their laboratories and why they cannot use the equipment due to breakdown.

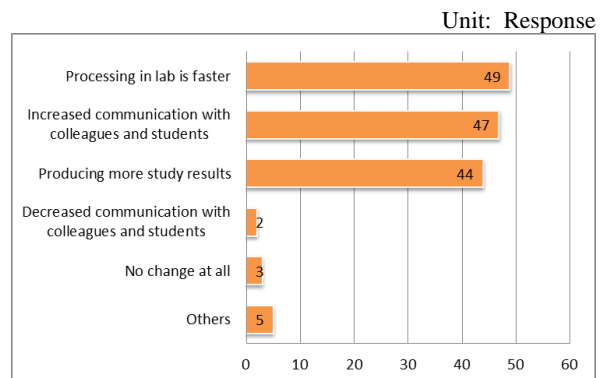
In regard to the equipment allocated to each laboratory, the needs assessment targeted at each laboratory was conducted before the project implementation in order to make preliminary procurement list. Some experts on equipment were dispatched to assist UGM in finalizing the list during the implementation. However, sometimes the practicing lecturer in a laboratory is different from the lecturer at the time of the needs assessment and her/ his research theme is different, and the specs of equipment have been changed or a part of planned equipment have not been procured through the finalization of the procurement list even if same lecturer works at the laboratory. This leads to the mismatch between their needs and the allocated equipment. Sometimes, one laboratory needs some equipment, which another laboratory does not need.

In sum, these responses to the beneficiary survey show the problems on mismatch between users’ needs and the allocated equipment and insufficient



Source: Beneficiary survey

Figure 5: Satisfaction with facilities



Source: Beneficiary survey

Note: Multiple answers

Figure 6: Changes of education and research before and after the project implementation

maintenance of equipment¹².

As to the question on changes of education and research before and after the project implementation, about 67% of the respondents answered that processing in their laboratories was faster than before the project and about 59.5% of the respondents answered that they produced more research results than before. These indicate that research efficiency is improved by development of buildings and equipment. Moreover, about 63.5% of the respondents marked the increase of communication with their colleagues and students. Positive effects on education and research are seen as a result of the development of buildings and equipment.

3.3.2.2 Achievement of Fellowship Program

Twenty five lecturers aimed at completing academic degrees in the fellowship program and all of them got master's or doctorate degrees. Nobody has moved to a different institute since returning from Japan. Every lecturer still teaches and conducts researches in UGM.

During the site survey, the achievement of degree program and non-degree program was confirmed by focus group interviews with 16 lecturers who participated in these programs. Each lecturer had several objectives to study in Japan as follows: to complete degrees (9 lecturers), to brush up their academic knowledge (12 lecturers), to learn Japanese (1 lecturer), to understand research culture in Japan (2 lecturers) and so on. Twelve out of 14 participants expressed that they could achieve their objectives. Regarding remaining two participants, one answered that he could mostly accomplish his objectives and the other answered that he achieved from 50% to 60% of his goals. Almost all the respondents achieved results as expected.

Most of them pointed out the effects of the fellowship program as follows: they could improve their academic technique and knowledge, they could gain confidence to teach and conduct researches, and they personally could get the worldwide network with researchers in other universities. Many lecturers appreciate that UGM has better reputation due to increase of degree holders and that UGM's internationalization progresses because of the Project. Moreover, a lot of lecturers expressed that they were impressed by research attitudes and education methods in Japan and they have been practicing it by themselves to their students or their teaching method has been improved since their return to UGM. Based on these opinions, it can be assumed that the effects of the fellowship program extend not only to degrees but also to qualitative improvement on education and research.

This Project has largely achieved its objectives; therefore its effectiveness is high

3.4 Impact

3.4.1 Intended Impacts

The goal of the Project is contribution to the development of regional and national economy through supplying high-quality human resources to governmental organizations and private enterprises. As mentioned above, UGM is one of the universities which puts priority on community activities as well as a core higher education institution in Indonesia. There are many examples regarded as indirect contribution to regional and national economic development although they directly affect macroeconomic indicators such as gross domestic product (hereinafter referred to as GDP).

3.4.1.1 Contribution to Regional Society and Economy

There were a lot of responses to the question about lecturers' academic performance contributing to national and regional development¹³ including Indonesian government project

¹² To be described later in detail.

¹³ For instance, Research about Traditional Medicine, Evaluation Analysis of Avian Influenza Virus Genetic, Development of Food Technology, Research about Kinds of Biomass, Research on Community Forestry, Research about Water Harvesting & Climate Change, Research about Rice etc.

and researches rooted in community. Although these researches directly affect GDP, considering the increase of academic results through having improved the research environment as mentioned above, it can be assumed that the Project made a certain contribution to economic development in communities and Indonesia indirectly.

There are many kinds of social contributions through, not only research but also advisory work to other universities in Indonesia as a core university and dispatch of lecturers as experts to Indonesian government or other governments. For the example of direct impact, a lecturer who studied pediatric care in Japan takes advantages of the knowledge and works for local children as a volunteer activity.

In addition, UGM makes contributions to regional society and economy through rental of UGM equipment procured under the Project and contracting of product tests with private companies by utilizing the equipment, as the procured research equipment is not widespread in Indonesian universities yet.

3.4.1.2 Contribution to Strengthening Collaboration with Japanese Universities and UGM's Internationalization

Currently there are 25 Japanese universities which conclude the Memorandum of Understanding (hereinafter referred to as MOU) with UGM. Academic exchanges between UGM and universities in Japan and various countries have become more active due to the implementation of the Project.

Table 7: Number of MOU (Top 15 countries, total)

Country	Pre-project	During Implementation	Post-project	Time Unknown	Accumulated total
Japan	13	42	14	2	71
Netherlands	12	22	5	4	43
South Korea	3	18	10	1	32
Austria	10	14	6	0	30
U.S.A	7	12	4	4	27
Malaysia	3	14	3	2	22
Germany	3	14	1	1	19
France	2	3	6	0	11
Sweden	3	6	2	0	11
China	0	5	4	1	10
U.K.	4	5	0	1	10
Canada	3	3	1	2	9
Australia	1	5	2	0	8
Thailand	1	5	0	2	8
Philippines	1	6	0	0	7

Source: UGM

Table 7 is classification of the total number of MOU which UGM has concluded so far by timing of conclusion (pre-project, during implementation of project, and post-project). The number of MOU with universities in Japan is the largest. It increased especially after completion of the Project. The number of MOU with universities with other countries increased after the Project too. According to UGM, the facilities in UGM are evaluated in concluding MOU so that the number of MOU increased after the Project. Therefore, it can be assumed that the development of buildings and equipment by the Project contributes to increased number of MOU to some extent. The Project may help not only promotion of joint research with universities in Japan but also international academic collaboration, or community activities derived from international collaborative researches.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

Waste from UGM has been segregated and properly disposed during implementation and after completion of the Project. Regarding wastewater including chemicals in particular, since a chemical wastewater treatment plant was constructed under the Project, the former situation has been improved so that the negative impact on the natural environment has been properly mitigated. Moreover, the landscape development under the Project impacted the natural environment in UGM positively.



Chemical wastewater treatment plant

(2) Land Acquisition and Resettlement

There has been no land acquisition and relocation of residents for the Project.

The Project has contributed to regional society and economic development in Indonesia. No negative impact on the natural environment has been observed.

3.5 Sustainability (Rating: ②)

3.5.1 Structural Aspects of Operation and Maintenance

According to JICA appraisal documents, the Project Implementation Unit (hereinafter referred to as PIU) was established in UGM for the Project and it was supposed to engage in maintenance of buildings constructed and equipment procured under the Project. After confirming the current structure for Operation and Maintenance (hereinafter referred to as O&M) during the site survey, PIU still exists and has three administration staff. However, PIU does not have any responsibilities for O&M but is in charge of planning and implementation of new projects. Traditionally O&M has been conducted by each faculty. Although some personal initiatives on maintenance of equipment are taken by several lecturers who are conscious of O&M, there is no systematic regular maintenance. Each responsible department or each lecturer in faculties requests manufacturers or suppliers of equipment to repair each breakdown. Buildings are maintained according to the regulation by Minister of Public Works (No.:24/Prt/M/2008, dated December 30, 2008). There are problems in aspects of operation of the O&M system although the O&M system/ structure is established for form's sake. It is assumed that the main factors lie in miscommunication between laboratories/lecturers and administration staff and little awareness about O&M of lecturers and students who utilize the equipment.

As will be mentioned in Financial Aspects of Operation and Maintenance, the O&M budget which is needed at this moment is substantially allocated. However, for example, some broken equipment is abandoned without repair since it is not familiarized to each lecturer in laboratories that have budget available for repair of their equipment. No regular maintenance of equipment resulted in emergency breakdown to which they cannot respond financially. Although there is a repair workshop on campus, some lecturers are not familiar with it. It was also observed that equipment such as microscopes, which could be repaired easier if they could get only spare parts, lies in neglect. These are attributable to not only inadequate publicity of the regulation and system but also lack of awareness that users have to get actively involved in maintenance of their equipment.

UGM management said that they would make efforts to publicize and raise awareness in order to let lecturers and students participate in the O&M process.

3.5.2 Technical Aspects of Operation and Maintenance

At the time of appraisal, concerning UGM's O&M capacity, it was assessed that UGM could operate and maintain newly procured equipment under the Project because UGM had maintained their existing equipment. During the site survey, however, it was confirmed that some equipment had been left unrepaired due to the technical reasons such as unavailability of the spare parts or impossibility of repairs in Indonesia. Moreover, there was a little unused equipment that users did not know how to use because some equipment did not have the manuals or because users could not get adequate practical training although they had simple instruction from suppliers at delivery.

While most equipment is adequately operated and maintained, some is unutilized or abandoned without repairs. In many cases of the abandoned equipment, newly procured equipment was technically more sophisticated than the average equipment that UGM had owned before the Project implementation. It is assumed that their O&M ability for newly procured equipment was insufficiently confirmed at the time of appraisal. The problem might be attributable to inadequate studies of necessary, sufficient and feasible countermeasures against the O&M for such sophisticated equipment.

On the other hand, the equipment procured under the Project is required for researches even if it is difficult to obtain the spare parts or to repair it in Indonesia. In addition, it seems unlikely that it is unnecessarily sophisticated equipment, judging from the level of equipment procured under other similar projects in Indonesia. The sustainability of equipment for higher education institutions playing key roles such as UGM should be enhanced by adopting proper countermeasures during the implementation of the Project rather than by limiting the capacity to technologically-feasible ones in view of their missions to seek for cutting edge researches.

In the Project, some technical assistant experts for equipment selection had been hired to assist UGM in selecting equipment that met users' needs. And after the procurement, they were supposed to hold workshops on proper usage and O&M of the equipment and to prepare manuals if necessary. This plan was very realistic but it was also difficult to realize because the number of experts was limited and they have their day jobs as researchers at universities or governmental research institutes. As a result, the contracts with these experts were modified and their assignments were limited to giving advice on usages of some equipment within their expertise in the shorter term than the plan. In addition, the problems which the experts found out during their assignments were not fed back to consultants/ PIU staff. Those problems remained unsolved due to insufficient communication between the experts and project management consultants / PIU staff.

3.5.3 Financial Aspects of Operation and Maintenance

At the time of appraisal, it was confirmed that DGHE allocated UGM's O&M budget. After that, the university system reform has been conducted and introduced the independent accounting system¹⁴. At the time of ex-post evaluation, most of the O&M budget is appropriated from students' payments at university entry. The rate of budget execution is approximately 70% to 80%.

¹⁴ The independent accounting system is now being revised toward expanding the universities' independence and autonomy. Both DGHE and UGM expressed that the budget cuts to universities related to the independent accounting system had no impact on the operation and maintenance.

Table 8: Ratio of Own Funds to Subsidies

Unit: million Rp.

Year	O&M Budget (Repair Budget) ¹⁵	
	UGM	Subsidy
2008	944,534 (24,174)	249,395
2009	1,498,661 (68,939)	Unknown
2010	1,811,801 (43,324)	Unknown

Source: UGM

According to UGM's self-evaluation, UGM has enough O&M budget (Table 8) and no financial problems. However, the regular maintenance is not conducted at this moment. If UGM introduces the regular maintenance system, they might need additional budget.

3.5.4 Current Status of Operation and Maintenance

During the site survey, stains in many roofs of the buildings due to leakage in the drainage pipes were observed. However, those have been already repaired. There is no particular problem at the time of ex-post evaluation. The equipment is basically maintained well. A part of it, however, went out of order in the early stage of the project implementation and some was left abandoned. The reason it wasn't repaired, as mentioned above, was attributed to the institutional and technical problems.

In the focus group interviews, many participants cited inconsistency between the procured equipment and their research themes, inadequacy of equipment and financial and/or technical insufficiency of O&M and expressed displeasure with their research environment in UGM compared to more favorable research environment in Japan. In particular, concerning inconsistency between the procured equipment and their research themes, five out of 16 participants expressed that they do not use the allocated equipment because of mismatch to their research themes. Most participants pointed out problems on the timing of the needs assessment and procurement of equipment. Some participants explained that some equipment is unneeded in one laboratory, but it is needed in another laboratory. One of participants suggested expanding the integrated laboratories as one of the solutions.

Some problems have been observed in terms of structural aspects and technical aspects of operation and maintenance; therefore sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The Project objective was to develop high-quality human resources through improving the internal efficiency and the education and research activities quantitatively and qualitatively by supporting development of Gadjah Mada University. This objective has been highly relevant to the country's development plan, development needs, as well as Japan's ODA policy; therefore its relevance is high. Although the outputs were essentially completed in line with the initial plans, the project cost was within the plan, the project period slightly exceeded; therefore efficiency of the Project is fair. Based on the information gathered in this evaluation work, all the indicators (the internal efficiency of education, quantitative and qualitative improvement of education and research activities) have largely achieved the objectives or have shown a trend toward improvement; therefore its effectiveness is high. However, some problems have been observed in terms of structural aspects such as miscommunication between

¹⁵ The O&M budget includes salaries, supplies expense, maintenance cost, travel allowance, and investment. Number in parentheses shows only repair budget, equivalent to maintenance cost.

laboratories/researchers and administration office/staff and technical aspects such as difficulties in repairs; therefore sustainability of the project effect is fair.

In light of the above, this project is evaluated to be (B) satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

If funds permit, the investigation on the procured equipment should be conducted in order to clarify which items are not utilized and why they are not utilized. It is preferable to take the necessary countermeasures based on the results of the investigation. Without having to conduct expensive investigation, it is possible to enhance the sustainability of the Project effect by awareness-raising and effective use of the existing system. The concrete examples are as follows:

- 1) Efforts should be made to prepare manuals and deliver them to each laboratory in order to inform lecturers and students about various kinds of existing O&M systems and regulations in UGM;
- 2) Emergency breakdowns should be avoided by regular maintenance or preventive part replacement because cost of emergency repair for sophisticated equipment would be extremely expensive in many cases. In addition, lecturers and students who use equipment in their laboratories should not leave the broken equipment but participate in the O&M process actively;
- 3) Communication should be facilitated between administration offices and laboratories and the maintenance management system in UGM should be strengthened. In order to improve the communication, UGM should develop and introduce a kind of check list for reporting the problems to the administration office; and
- 4) In order to improve the operation rate of equipment, information exchange should be activated between the existing integrated laboratory and each lecturer's laboratory by the school LAN system to ensure researchers' open access to the unutilized equipment.

4.2.2 Recommendations to JICA

After the confirmation of the needs on the Indonesian side, it is desirable to provide assistance to the investigation about current state of equipment, its reparability and users' demands as follow-up measures.

4.3 Lessons Learned

In the case of projects that include equipment provision, generally speaking, it is not only difficult to determine the users' needs for each item of equipment in detail in advance but also necessary for both executing agencies and JICA to carry the several burdens of management costs due to the short cycle of technology innovation and equipment renewal. Therefore, when JICA assists with facilities/ equipment in higher education institutions like this project, it is necessary to consider what and how JICA should assist in accordance with the project objectives, their missions and their O&M capacities.

For example, if JICA provides assistance to core research institutions like UGM, it is necessary to procure a certain level of equipment. However, since laboratories in universities or research institutions are compartmentalized by expertise, if JICA provides sophisticated equipment to these institutions, the ingenious project implementation is required; such as intensive support to limited laboratories and experts' assignments in order to let the equipment meet users' needs to some extent. In the latter case, a variety and number of experts should be considered. As professors usually cannot stay at the project sites for a long time, frequency and duration of experts' trips to the site also should be considered. Moreover, if technical assistance experts are hired in addition to the consultants, project implementation structure should be

established in order to be able to coordinate each other and to take long-term measures to the problems found out by the experts' short-term activities.

On the other hand, if the project objective put emphasis on "education" rather than "research", consideration should be given to restricting the equipment to commonly-used items or to develop the system for equipment sharing in order to raise the operation rate of equipment and maintain the equipment easily. It might be worthwhile to consider excluding equipment from the components of ODA loan or lending to the recurrent cost.

It is necessary to collect data and information needed for monitoring the project effect, especially operation and effect indicators set at the time of appraisal, during the implementation of the Project. Project management consultant should provide on-the-job training of project monitoring to staff concerned in executing agencies (not only to PIU staff but also staff that actually operate the facilities). Moreover, the project monitoring system should be planned in accordance with the existing system, if any, and should not be unique to the ODA loan project in order to ensure the feasibility of implementation.

End

Comparison of the Original and Actual Scope of the Project

Item	Original	Actual
1.Project Outputs		
1) Building construction	Construction (total 68,000 m ²) and infrastructure development for 7 faculties	Construction (total 86,180 m ²) and infrastructure development for 7 faculties (partially added to the plan)
2) Equipment procurement	Procurement of equipment for education and research and fanitures	Almost as planned. Partially added to the planed equipment for faculties of agriculture.
3) Fellowship program	35 lecturers in total	41 lectures in total
4) Consulting services		
- Engineering services	440MM	776.05MM
- Project Management services	327MM	505MM
- Fellowship services	73MM	79MM
5) Technical assistance	Equipment: 7.5MM Fellowship: 4.0MM	Equipment: 2.47MM Fellowship: 0 MM
2.Project Period	Nov. 1997 – Feb. 2007 (108 months)	Jan. 1998 – Feb. 2009 (132 months)
3.Project Cost		
Amount paid in Foreign currency	3,002 million yen	2,847 million yen
Amount paid in Local currency	6,996 million yen (134,538 million Rp)	4,855 million yen (406,896 million Rp)
Total	9,998 million yen	7,702 million yen
Japanese ODA loan portion	7,499 million yen	6,479 million yen
Exchange rate	1 Rp = 0.052 yen (As of April 1997)	1 Rp = 0.012 yen (Average between Jan. 1998 and Feb. 2009)