

Indonesia

Mulawarman University (UNMUL) Development Project

Field Survey: June 2003

1. Project Profile and Japan's ODA Loan



Project site location map



The newly constructed science faculty building

1.1 Background

Mulawarman University (UNMUL) fulfills an important role as a hub for educational and research activities in the East Kalimantan region. Responding to requests from regional society, governmental organizations, industrial sectors and from various other quarters, the university's mission is to develop the human resources that will take the lead in the future development of East Kalimantan's economy and to conduct surveys and research; however, the need to improve internal efficiency¹ and educational quality, as well as to undertake preparations towards the establishment of a science faculty had been pointed to as specific issues needed to be addressed.

With these issues in mind, in 1988 UNMUL put together a master plan for the development of the university, which it followed up with plans to develop three faculties – agriculture, forestry and science – that were formulated in 1992. The master plan assumed that student numbers would have reached around ten thousand by 2000, the target year, and was formulated with a view to developing the various facilities that would be necessary to deal with this level of demand for human resources development. As part of these efforts, this project undertook development and improvement activities focusing on the faculties of agriculture, forestry and science.

¹ Internal efficiency is designed to show how educational resources are being efficiently utilized and whether outputs are cost-effective within a given educational system and incorporates quantitative and qualitative aspects. Quantitative efficiency is increased by reducing overspending in the educational system due to dropouts and repeaters enabling more students to advance to the next stage of their education and sending more graduates out into the labor market. Qualitative efficiency relates to learning achievements and is enhanced by the combination of educational resources, including the dissemination of textbooks and learning materials, the introduction of appropriate curriculums, quality teaching staff, and facilities improvements.

1.2 Objectives

The project's objectives were to develop human resources and promote studies and research in specialized fields by developing and improving facilities and equipment in the faculties of agriculture, forestry and science at Mulawarman University (UNMUL), which is located in East Kalimantan – a province with many tropical rainforests, and thereby contribute to the development and use of natural resources and to preservation of the environment in the region.

1.3 Output

Major project outputs were the development of facilities and the procurement of educational / research equipment and related items for the faculties of agriculture, forestry and science, and the provision of related consulting services (see below for details).

Output

Component	Contents
(1) Building construction	<ul style="list-style-type: none"> The construction of new buildings and offices for the faculties of agriculture, forestry (including the graduate school) and science
(2) Site development	<ul style="list-style-type: none"> The development of the sites and facilities attached to the faculties of agriculture, forestry (including the graduate school) and science, and of the campus as a whole
(3) Procurement of equipment and related items	<ul style="list-style-type: none"> The procurement of equipment necessary for education / research in the faculties of agriculture, forestry (including the graduate school) and science
(4) Engineering services (E/S)	<p>[At the detailed design and construction preparation stages]</p> <ul style="list-style-type: none"> Building construction and site development: preliminary survey, detailed design, cost estimate, preparation of tender documents, tender evaluation support Procurement of instruments and equipment: compilation of equipment list, preparation of tender documents, tender evaluation support Dispatch of experts: recruiting of experts and operational support <p>[At the construction supervisory stage]</p> <ul style="list-style-type: none"> Building construction and site development: construction supervision, final inspection Installation of equipment and related items
(5) Project management services (PMS)	<ul style="list-style-type: none"> Preparation stage: project preparation support Design stage: coordinate related parties Tender stage: support for governmental approval procedures, etc. Construction stage: coordinate related parties regarding scheduling and costs Operation and maintenance stage: coordination of handover, coordinate related parties for project completion
(6) Dispatch of experts (in coordination with technical cooperation)	<p>[Selection of instruments and related equipment and activities to promote their utilization, to be provided by foreign university professors and researchers]</p> <ul style="list-style-type: none"> Instrument / related equipment selection: study education / research plans, review equipment purchasing list Equipment utilization: evaluate education / research plans, provide training / advice to facilitate equipment use

1.4 Borrower / Executing Agency

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

1.5 Outline of Loan Agreement

Loan Amount	3,062 million yen
Loan Disbursed Amount	2,796 million yen
Exchange of Notes	December 1995
Loan Agreement	December 1995
Terms & Conditions	
Interest Rate	2.5%
Repayment Date (Grace Period)	30 years (10 years)
Procurement	General untied (consultant component: partially untied)
Final Disbursement Date	December 2001

2. Results and Evaluation

2.1 Relevance

The objectives of this project were highly consistent with both national and regional development plans. Current at appraisal, the sixth five-year national development plan (REPELITA VI: 1994-1998) placed increases in student numbers (percentage share) in science and technology fields at the center of its human resource development goals, which was consistent with the direction of this project: to strengthen and improve the faculties of agriculture, forestry and science. Moreover, besides continuing to prioritize the development of human resources, under PROPENSAS (2000-2004), the national development plan in progress at ex-post evaluation, greater emphasis has been placed on the need for regional development as compared to at appraisal. Specifically, in regard to higher education, developing balanced training for regional development personnel through improvements in the education and research activities being undertaken at regional universities has been put forward as a priority sector, further enhancing the significance of the project plans.

This project is also highly consistent with East Kalimantan's development plans (2001-2005). This plan sets forth (1) the development of human resources to contribute to regional economic development, and (2) the sustainable use of the province's abundant natural resources as its vision / mission, which is in accordance with the direction of this project, the aim of which was to strengthen educational and research activities relating to the use of natural resources at

UNMUL, the only multidisciplinary national university in the province. Further, UNMUL is fulfilling an important role as a source for the human resources that will lead development in the province. For example, within the provincial government, 80 percent of East Kalimantan's government officials, including the provincial governor and his/her aides, graduated from UNMUL. Added to which, in 2001 with the enforcement of the decentralization law, the province's prefectures increased from seven to twelve thereby strengthening the need for human resources to participate in the development of the region, thus the project is considered to have been consistent with the needs at the time of this evaluation.

Figure 1: Kalimantan's forest resources



2.2 Efficiency

2.2.1. Outputs

(1) Building Construction

The construction of buildings / facilities for the faculties of agriculture and forestry and the newly established science faculty was essentially completed in line with the initial plans. Furthermore, the construction of the Basic Sciences Laboratory was added to the scope.

Figure 2: A Tropical Rainforest Ecology Laboratory, Faculty of Forestry (initial output)



The additions were made as part of the measures to enhance the quality of education and research. Damage occurred during the implementation phase due to landslides and flooding, in response to which a follow-up soil survey was conducted, reinforcement work undertaken and new drains and a pump station constructed².

**Figure 3: Faculty of Basic Sciences
Laboratory
(currently Faculty of Medicine)**



(2) Site Development

This work was essentially completed in line with the plans.

(3) Procurement equipment and related items

All purchases were essentially made in line with the plans.

(4) Technical assistance (engineering services: detailed design / construction supervision); project management service (PMS) (project execution support) and dispatch of experts (equipment selection / use guidance, etc.)

Additional inputs were made where appropriate to project execution. Personnel inputs of various forms were made, namely: a PMS consultant (a local company), and engineering service (E/S) consultant (a Japanese company) and technical assistance experts (Japanese). The division of roles among these parties was clearly stipulated in the Terms of Reference (TOR) that were compiled during project planning, and it is reported that each party was performed its role as expected. According to the E/S consultant and other project proponents, under the strong leadership of a professor in the faculty of agriculture – the head of the university’s project implementation unit (PIU) –the staff members drawn from the various faculties undertook the duties assigned to them appropriately.

2.2.2. Project Period

The execution for this project was scheduled to span December 1995 through November 2000, but was actually completed in June 2002 (including a 6-month quality assurance period). The new facilities accepted students in September 2001, and the outputs stated in the initial plans were essentially completed with the original project period.

2.2.3. Project Costs

² This landslide was caused by rainfall and only affected the public road; no damage was confirmed to regional residents.

Total project costs amounted to approximately 3 billion yen, which is equivalent to around 80 percent of the initially estimated sum of 3.6 billion. Of this, the actual loan disbursement amount approximated to 2.8 billion yen against a loan of around 3 billion. The depreciation of the rupiah kept costs under the budgeted amount meaning that the initial outputs could be completed essentially in line with the plans and, further, enabling the construction of a basic sciences laboratory as part of efforts to improve the quality of research at the university.

Table 1: Comparison of Planned & Actual Project Costs (unit: million yen)

Component	Planned				Actual			
	Foreign currency	Local currency		Total	Foreign currency	Local currency		Total
		Eligible portion	Ineligible portion			Yen loan	Borrowing country	
Building construction	170	981	0	1,151	279	992	130	1,402
Site development	0	557	0	557	0	237	24	261
Equipment procurement	701	24	0	725	687	18	0	705
Furniture procurement	0	76	0	76	0	62	0	62
Book purchases	37	1	0	38	36	0	0	36
Contingencies	91	164	0	255	0	0	0	0
Engineering services	251	131	0	382	293	120	0	412
Project management services	0	69	0	69	0	52	0	52
Technical cooperation	19	3	0	22	14	4	0	18
Tax	0		327	327	0	0	0	0
Total	1,269	2,006	327	3,602	1,309	1,485	154	2,948

Note 1: Charges incurred upon the disbursal of the foreign currency portion are excluded.

Source: Appraisal data and the project completion report

2.3 Effectiveness

2.3.1. Qualitative & Quantitative Improvements in Educational / Research Activities

In improving their facilities and equipment, this project is recognized to have been effective in improving the ability of the three target faculties to accept students and to have increased student numbers in the same three faculties. Judging from the data collected for this evaluation it is considered that the project's objectives of "developing the human resources necessary for environmental conservation and promoting surveys / research" are being realized; however, it is difficult to specify the extent of its contribution.

[Facilities / Equipment Use Status]

It was not possible to fully verify the use status of the facilities that were developed via this project, in part because the survey was undertaken during the summer vacation; however, despite this fact, students were observed working in the classrooms, computer room and the library's reading room. The results of interviews with teachers and students (see Box 1) also suggest that the facilities are being used to a certain extent. Based solely on observations of both old and new facilities, as compared to the old laboratory, the equipment in the new laboratory is being used less frequently than anticipated due to level of proficiency.³

Accurate data on the operating rates of laboratory equipment⁴ was not able to be obtained, and whilst comments were made on microscopes, computers, etc., to the effect that they are: "useful and used frequently during classes", "there are not enough", it was also learned that some equipment, including expensive analytical devices (gas chromatographs, etc.) was used less frequently.

Among the other facilities, the botanical garden at Lempake training forest (62.4 ha) is being well used⁵. The training forest was previously used for forestry and agriculture faculty lessons and for joint research with external organizations, and according to the teacher responsible for its management (forestry faculty) since project development work was completed there has been an increase in applications to conduct joint research⁶. Added to which the training forest is used as a venue for informative seminars for local residents, and has been opened to the public as a recreational facility that is jointly operated by Samarinda City, with average monthly visitor numbers reaching 7,000.

³ With the exclusion of some administrative facilities, since the establishment of the new buildings UNMUL has been utilizing them in conjunction with the old laboratory block in an attempt to maximize facilities use. During the field survey, more students were observed undertaking various experiments in the old laboratory block and it was livelier than the project facility.

⁴ According to the PIU manager, there are plans to ask each faculty to compile and submit reports on equipment status in September 2003.

⁵ Project funds were used to plant trees, build forest roads / fences, develop facilities for garden visitors, construct a management building, etc.

⁶ Whilst the pre-project number of research programs is not known, 10-20 applications were accepted in 2002.

Figure 4: Students gather in the Faculty of Agriculture's Agribusiness Research Room (computer room) even during vacation



Figure 5: An electron-microscope with TV monitor, Faculty of Forestry (teachers report that it is a useful teaching aid)



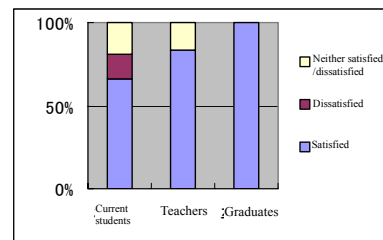
In 2001, on the basis of increasing needs for the medical sector, UNMUL began using the basic sciences laboratory as the building / laboratory of the “medical education program” (referred to as “the medical faculty” hereunder) under a previous arrangement with the faculty of medicine. Although this is consistent with increasing needs for medical sector, given that other faculties hesitate to access the building and its laboratory equipment⁷, for the future, it is hoped that flexible arrangements can be made with other faculties regarding the joint use of the facilities / equipment.

Box 1: Interview Survey of Teachers & Students

During this field survey, students and teachers in the faculties of agriculture, forestry and science were interviewed regarding their satisfaction with the facilities, etc. Interviews were conducted with (1) 12 teachers, (2) 25 current students, and (3) 4 ex-students who had graduated since 2001 (the year the facilities were completed). The teachers and students were those who happened to be on site during the visits that were made to each of the faculties.

The tallied results on satisfaction with the facilities are as shown in the figure at right, with around 70 percent of respondents of teachers and students indicating that they are satisfied, and comments received to the effect that they are achieving more results from research and that they are able to obtain more accurate experiment results since project completion, etc. By contrast, more than half of the student respondents commented that: “there is not enough equipment (microscopes, computers, etc.)”, and teachers gave voice to concerns about using sophisticated equipment due to a lack of training.

Satisfaction with project facilities



In terms of equipment that is being used frequently, the most frequently cited item, by both teachers and students, was the microscopes. Otherwise, teachers referred to expensive analytical equipment, such as UV visual spectrophotometers, atomic absorption spectrophotometers, and liquid chromatographs, whilst the students predominantly cited general-purpose equipment, such as tension gauges, spectrometers, stethoscopes and projectors. Regarding time spent in the new laboratories (weekly average), teachers spend 15 hours and students 5 hours.

In terms of the use of the books that were provided to each faculty, 9 teachers (83%) and 17 students (71%) stated that they refer to these books at least once a week.

⁷ Generally speaking, with the exception of activities undertaken in various research centers by teachers from several faculties (social forestry center, tropical rainforest research center, etc.), and through personal relationships among teachers, inter-faculty use of facilities is not frequent.

[Transition in student numbers]

In 1994, prior to project implementation, the agricultural faculty had 985 students and the forestry faculty 789 (the science faculty is excluded as it was as yet unopened). In 2002, these figures had increased to 2,299 students (including those enrolled in the fisheries and marine science faculty) and 1,407, respectively; with 465 students in the science faculty. Figure 6 illustrates transitions in student numbers in the three faculties and the estimates made at appraisal. Although the agricultural faculty (including the fisheries and marine science faculty, which was split off in 2001) and the forestry faculty have not reached the estimated targets, with student numbers in the latter having stagnated since 2001, all numbers have increased against pre-project levels. Regarding student numbers in the science faculty newly opened in 2001, whilst there are still only first and second year students enrolled at this time, their numbers have already surpassed the estimates. As Table 2 reveals, although the learning environment has improved from its pre-project level in all three target faculties in terms of building area per student, the increases in student numbers mean that the faculties are not meeting Indonesia’s standards and further improvements are anticipated⁸.

Figure 6: Predicted & Actual Student Nos.

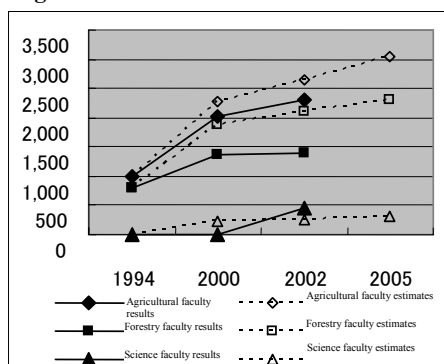


Table 2: Building area per student (unit: m²)

Faculty	Pre-project ¹⁾ (1995)	Post-project ¹⁾ (2001)	Indonesian standard ²⁾
Agriculture	2.55	6.05	12
Forestry	3.42	5.01	12
Science	-	8.44	12

Note 1: Total classroom / laboratory area for agriculture, forestry and science faculties.

Note 2: From DGHE. Total classroom / laboratory area for agriculture, forestry and science faculties.

Source: Compiled from UNMUL data

Source: Compiled from UNMUL data

[Increased Number of Departments]

Both the faculties of agriculture (including the fisheries and marine science faculty) and forestry have expanded their education content, increasing by one the number of departments available to students in the period spanning the implementation of this project.

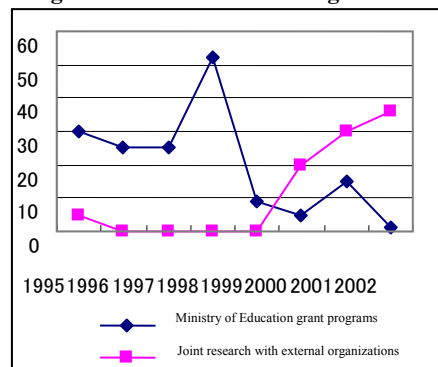
⁸ Student numbers are also on the increase in the faculties of economics, education and others (despite no specific infrastructure development). UNMUL explained that one of the factors underpinning these increases, as a nationwide trend, is the growing popularity of science, medicine, engineering and the social sciences, which are more useful in the job market than agriculture and forestry.

[Increased Number of Research Programs]

As Figure 7 illustrates, there has been a sharp decline in the number of Ministry of Education grants for research programs since 2000, which UNMUL explained to be the result of a decrease in the Ministry of Education's research budget⁹.

On the other hand, there has been a major increase in the number of research programs being conducted in conjunction with external organizations (universities and other environmental measurement laboratories) since 2000, which is covering the

Figure7: No. of Research Programs



Source: Compiled from UNMUL data

reduction in Ministry of Education subsidized programs. Further, from interviews with twelve teachers it was ascertained that nine research programs are being undertaken using the equipment supplied via this project. Given these circumstances, it is believed that the project is contributing to increased research opportunities at UNMUL, which has been unable to receive grants from the Ministry of Education, although it is not possible to quantify the extent of this contribution.

Box 2: An Example of Equipment Use

One example of the contributions being made to the region by the use of equipment provided through this project is the study of landfills in Sangatta (located some 150km from Samarinda), which was commissioned by Kaltim Prima Coal (KPC), Indonesia's largest coal corporation. Facilities and equipment set up in the faculty of agriculture's soil laboratory were utilized to undertake this survey, which confirmed that the application of chemical fertilizers was unnecessary since weeds were growing on the landfill and examined the feasibility of using the site for the cultivation of horticultural crops. From the latter experiments it was confirmed that the area was suitable for a number of crops, including cashew nuts, a result that will link to the incomes of local farmers. The government of East Kalimantan had considered turning the landfill into an urban area; however, KPC considered that the land might be more suitable for agrarian use due to concerns about soil stability and water quality, and commissioned UNMUL to undertake a survey, the results of which are expected to contribute to conservation of the environment and increases in (farm) income.

[Contribution of External Factors]

This project differs from many of the university development projects that have been undertaken using yen loan funding in that responsibility for the degree program for university

⁹ This is believed to be attributable to the economic crisis. JICA's 4th country study report on Indonesia (November 2000) states that, considered in terms of the impact of the economic crisis on this sub-sector of higher education, research funds have shown signs of leveling off or declining slightly since fiscal 1997/98; when viewed in terms of the drop in the exchange rate, this equates to a considerable decline in real terms.

teachers was assigned to the Indonesian side and was not included in the project outputs¹⁰. Appropriate development of teacher resources is one of the prerequisites for qualitative improvements in education and research and, with this in mind, UNMUL has been actively implementing its degree program for teachers. This is considered to be one of the positive external factors that is promoting the generation of project outcomes¹¹.

2.3.2. Improvements in Efficiency of University Education

The qualitative and quantitative improvements in educational activities detailed above were expected to bolster internal efficiency; however, since the students that have entered UNMUL since project completion (academic year commencing September 2001) have yet to graduate, it is too early to make an appropriate judgment on this parameter.

Likewise, it is premature to measure external efficiency (the degree of socioeconomic contribution made by graduates employed in the workforce) appropriately at this point since, as indicated above, UNMUL has yet to produce any graduates who have reaped the full benefits of this project and, moreover, no data has been collected on the employment rates and career paths of UNMUL graduates. According to the East Kalimantan government official responsible for development, many graduates stay within the province and are participating in the development of its economy and society; however, it was not possible to obtain data on the extent of this participation.

2.4 Impact

Regarding efforts to promote the development and use of natural resources in tropical rain forest areas, the social forestry program (dissemination activities are in progress targeting residents of the West Kutai region based on an inventory of forest resources that was compiled using the geographic information system (GIS) supplied to the faculty of forestry via this project) being run by the social forestry center, a research center established in tandem with this project, and the research on land use in Sangatta that was outlined in Box 2, can be cited as examples of activities that can be expected to generate an impact in the near future. At the present time, the facilities and equipment developed via this project are increasingly being utilized for research activities, and it would appear that the results of these activities have yet to be applied to the control and use of natural resources. Also, in terms of natural resources development by

¹⁰ According to appraisal data, this was based on a Ministry of Higher Education decision to the effect that it did not want to limit the destination of foreign studies to Japan.

¹¹ Between 1995 and 2002, some 70% of the teachers belonging to the three target faculties obtained doctorates or master's degrees from universities in Indonesia, Europe, the US and/or Japan. The government of East Kalimantan is also actively supporting the development of UNMUL's teaching force, and will award a maximum of 40 grants to UNMUL teachers studying for a degree.

graduates, it is considered too early to evaluate the activities of UNMUL students who entered after project completion (September, 2001) as they have yet to graduate.

With regard to environmental conservation, it is predicted that contributions will be made to eco-conscious development as the students who entered after project completion start to graduate.

2.4.1. Environmental Impacts

No specific environmental impacts attributable to this project have been identified. There have been no reports of any problems with land acquisition or resident relocation. Although there were concerns that the bank protection work that was undertaken in order to prevent flooding within UNMUL grounds at appraisal on the Karangmumus river, which flows along the south side of the campus, might increase the flood damage on the opposite bank, UNMUL explained that there have been no notable problems in connection with this matter. Simple hearings were held with two of the residents on the opposite bank during the current field survey; opinion was not heard that there has been apparent increase in flood damage since the project was completed¹².

Waste water is neutralized in limestone in individual laboratory disposal facilities and released into the Karangmumus river via open ditches. Meanwhile, organic waste is incinerated on campus, and UNMUL explained that: “the laboratories receive instruction on disposal methods, but since few heavy metals are used at present there is no cause for concern.” The executing agency has not reported any specific problems in this respect at the present time, but current waste water disposal facilities are unsophisticated, and further, since it was not possible to confirm the appropriateness of waste disposal measures it is hoped that the disposal of both waste water and waste matter will be properly monitored in the future.

2.5 Sustainability

2.5.1. Executing Agency

(1) Technical Capacity

There are no problems in this area.

(2) Operation and Maintenance System

In line with the plans drawn up at appraisal, the operation and maintenance of UNMUL

¹² Rather, the provincial government-funded project to construct roads, bridges and drainage ditches, which was executed in parallel with this project, has served to reduce flood levels from around 50cm above floor level to around 30cm.

facilities, including those established via this project, is being handled by the university's administration and finance bureau (located within the second vice-president's office¹³) and the faculty administration and finance bureau (also located within the second vice-president's office). Reports on the status of laboratory facilities and equipment and maintenance requests go through the following channel: laboratory managers → head of department → dean of the faculty (actually the aforementioned administration and finance bureau) → president (actually the aforementioned university administration and finance bureau). The university administration and finance bureau employs consultants and/or contractors as necessary for the undertaking of facilities' maintenance and applies to suppliers in the case of equipment repairs and there are no specific problems in this area.

At appraisal, consolidated plans were agreed to be drawn up relating to the use, operation and maintenance of equipment (plans for the procurement of consumables, chemicals and spare parts, the necessary budget, etc.), which were submitted to and approved by JBIC; however, the plans were not developed at the time¹⁴.

In addition to this permanent institutional system, where necessary, the PIU that was established at project startup, makes adjustments to the operation and maintenance mechanism in cooperation with the president and the faculty heads. The PIU has an office comprising a working-level manager and four staff members who work under the PIU manager, which, in addition to its aforementioned adjustment function, supervises university development projects¹⁵ that are either in progress or in the pipeline. The PIU manager has considerable influence with the president and the faculty heads and is playing a major role in the operation and maintenance of project facilities.

(3) Financial Status

The costs to cover the operation and maintenance of the facilities and equipment that was developed via this project are sourced from UNMUL revenues and the provincial government budget; however, these amounts are not considered to be sufficient and there are slight concerns in connection with UNMUL's finances. By comparison, UNMUL's total operation and maintenance budget for fiscal 2003 has been set at approximately Rp2.7 billion (of which Rp1 billion is a subsidy from the East Kalimantan government), and whilst these will allow for minimal maintenance work to be undertaken, it is believed that this sum will make it difficult to

¹³ UNMUL has four vice-presidents under the president; the second vice-president is responsible for general affairs and finances. Faculty level has also same structure.

¹⁴ According to the report from UNMUL after the completion of the project, this was because of lack of funds caused by the economic crisis that occurred after the project was initiated, and so on.

¹⁵ The construction of new engineering faculty building is currently in progress under provincial government assistance.

purchase the spare parts for expensive analysis equipment, reagents and so on sufficiently.

According to UNMUL, the university's operation and maintenance budget is equivalent to 70 percent of revenues from tuition fees; however, since revenues per se are low¹⁶ this does not amount to a sufficient sum. To address this problem attempts are being made to boost revenue by promoting commercial research activities (research funded by commission fees, such as the case described in Box 2).

2.5.2. Operation & Maintenance Status

UNMUL reports that with the exclusion of the points elucidated hereunder, the facilities and equipment developed via this project are largely in good condition. Evidence of damage to some floor tiles, and malfunctioning student computers, etc. was observed, but countermeasures are being planned and/or implemented. Apparently, all this work is to be funded by using UNMUL's facilities operation and maintenance budget.

3. Feedback

3.1 Lessons Learned

[At equipment selection, decisions must be made in a comprehensive manner that incorporates consideration for appropriate operation and maintenance cost levels as well as the management policies and action plans of the institution to which such equipment is to be supplied.]

One of the problems that has arisen in relation to this project are predominantly due to the large maintenance costs¹⁷, which means that opportunities to use sophisticated equipment are few, the experience and technical knowledge needed to operate such equipment effectively is not being accumulated, and this is observed to have linked to deficiencies from a technical perspective as well. By contrast, should the university's policy of undertaking commissioned research, which is aimed at subsidizing operation and maintenance costs, take off, it has the potential to increase opportunities for the equipment to be utilized, enable the accumulation of experience and technical knowledge, and moreover to link into high quality research activities. Accordingly, when making selections on equipment, it is believed that giving due consideration to the management policies of the recipient institution and the future plans that have been formulated on the basis of same when estimating the feasibility of maintenance work, formulating plans for the use of equipment and so forth, will serve to enhance project effects and their sustainability.

¹⁶ National university tuition fees are uniformly regulated by the Ministry of Education.

¹⁷ For example, electricity expenses of many of procured equipment, such as gas chromatographs, are high because they need more electricity than that of old equipments.

3.2 Recommendations

[To UNMUL]

(1) Promote the inter-faculty use of facilities developed via this project

The basic sciences laboratory that was constructed via this project was built “for mutual use by several faculties”; however, in practical terms, it is currently being used as a faculty of medicine facility, and the teachers from the science and other faculties, who were the originally envisaged users, are not able to gain sufficient access to the facilities and equipment in this building. Specifically, students in the faculty of science have already exceeded forecasts made during the design phase, and it is considered that this faculty has considerable needs for the facilities and equipment in the basic sciences laboratory. Therefore, it is hoped that the university will reposition the use of these facilities / equipment, formulate a mechanism to facilitate flexible joint usage and promote inter-faculty use.

(2) Compile a comprehensive plan regarding the use and maintenance of equipment, a plan which was postponed due to the effects of the economic crisis, and promote effective equipment use.

UNMUL reported that the comprehensive plans regarding the use, operation and maintenance of equipment that were agreed at appraisal have not been developed for a number of reasons, including the economic crisis. As a countermeasure, it is hoped that the university will act swiftly in developing operation and maintenance plans for the facilities and equipment supplied, including monitoring usage outcome, and that this will link to effective utilization.

(3) Monitor project impacts (establish an information-gathering system for monitoring the career paths of future graduates).

The objective of this project was to develop the human resources necessary for efforts to develop and use natural resources and to contribute to environmental conservation in the region, as well as to promote surveys and research; however, data to measure these effects was not obtained during the course of the survey that was undertaken for project evaluation. One of the reasons cited for this was that it is too early to pass judgment since the project beneficiaries have yet to graduate; another, that the university is not gathering related data. It is hoped that UNMUL will act in developing a system for measuring, and will monitor, the contributions made by its human resource development activities to regional development and environmental conservation in the project, so that the lessons learned via the implementation of this project can be put to use in future development of the university.

Comparison of Original and Actual Scope

Item	Planned	Actual
1. Outputs		
1. Building construction	Total floor area: 19,346m ²	Total floor area: 24,296 m ²
1) Agriculture faculty buildings	Construction of a research laboratory, field laboratory, green house; building renovation (7,829 m ²)	Essentially as planned (8,122 m ²)
2) Forestry faculty buildings	Construction of a laboratory / classroom block, administration office, hall, post-graduate block, workshop (6,011m ²)	Essentially as planned (6,048m ²)
3) Science faculty buildings	Construction of laboratory / library block, classroom / administration office, green house (5,506m ²)	Essentially as planned (5,626m ²) Additional construction of a basic sciences laboratory (4,500m ²)
2. Site development		
1) Development of site / facilities attached to buildings	Roads, car parks, scenery (landscaping), waste water disposal facilities, ground improvement (soil elevation, compacting), water / electricity / telecommunications facilities, street lighting, etc.	Agriculture, forestry, science faculty components all implemented essentially as planned Similar site development work implemented for areas peripheral to the basic sciences laboratory (additionally constructed)
2) Development of all campus-related facilities	Development of botanical garden at Lempake Training Forest; water supply facilities, including deep wells, pump room, etc.; solid waste disposal repository / link road; ground improvement of marsh land; installation of campus border fencing, development of river bank environs (bank protection work, etc.)	Essentially as planned
3. Purchase of equipment and related items		
1) Agriculture faculty	Laboratory equipment: 690 items; Books: 504	Laboratory equipment: 315 items Books: 758
2) Forestry faculty	Laboratory equipment: 656 items Books: 419	Laboratory equipment: 239 Books: 871
3) Science faculty	Laboratory equipment: 411 items Books: 469	Laboratory equipment: 83 items Books: 407
		Additional procurement of furnishings, etc., for the basic sciences laboratory (additionally constructed)

4. Engineering services 1) Foreign engineer 2) Indonesian engineer	88MM 149MM	109MM 252MM
5. Project management services	157MM	254MM
6. Technical assistance 1) Equipment selection 2) Book selection	7.5MM 1.5MM	15MM (addition of an Indonesian expert) 1.5MM (change of Indonesian expert)
2. Project period 1) E/S consultant selection 2) PMS consultant selection 3) Grounds development 4) Building construction 5) Equipment procurement / training 6) Furniture procurement 7) Book purchases 8) Technical assistance	August 1995 – July 1996 August 1995 – January 1996 October 1996 – November 1999 December 1996 – November 2000 January 1998 – March 2000 January 1998 – November 1999 April 1999 – December 1999 December 1996 – March 2000	October 1996 – November 1996 April 1996 – July 1996 November 1996 – April 2000 June 1997 – June 2002 May 1999 – November 2001 July 1999 – June 2001 February 2001 – August 2001 - December 2001
3. Project costs Foreign currency Local currency Total ODA loan portion Exchange rate	1,269 million yen 2,333 million yen (51,847 million rupiah) 3,602 million yen 3,062 million yen Rp1 = 0.045 yen (as of November 1995)	1,309 million yen 1,639 million yen (117,071 million rupiah) 2,948 million yen 2,794 million yen Rp1 = 0.014 yen (average for November 1996 – December 2001)

Third Party Evaluator's Opinion on Mulawarman University (UNMUL) Development Project

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Relevance

The objectives of the project were consistent with the national and regional development plans, i.e. the priority of the sixth five-year national development plan (REPELITA VI: 1994-1998) on the education sector which placed percentage share increases in science and technology student numbers as one of the focus of human resources development policy. The project objectives have gained more relevance with current national development plan, PROPENAS 2000-2004 and the onset of regional autonomy since 2001 that has placed greater emphasis on human resources development at the regional level by giving more roles to universities such as Mulawarman University in East Kalimantan.

Science and technology graduates have been mainly produced by national and established universities in Java, whereas needs for such graduates in the regions have been increasing especially for provinces rich in natural resources and based on the agriculture sector such as East Kalimantan province. In addition, East Kalimantan province needs capacity building in the sustainable management of its natural resources which Mulawarman University is in a unique position to assist by providing advocacy, training and practical research outputs.

There are many complementary projects in progress financed by the Ministry of National Education that focuses on the development of the management capacity at the Department level, including human resources development of the teachers. The projects mentioned include all discipline, in the social and natural sciences field. The Mulawarman University Development Project scope and target, therefore is highly appropriate and complement other existing higher education development initiatives undertaken by GOI.

Sustainability

Concern has been voiced regarding the adequacy of funding for operations and maintenance from the existing limited budget of Mulawarman University. The University has envisaged to cover the necessary operational and maintenance shortfall through revenues from provincial government and commercial research activities using the facilities. A system of cross-subsidization has to be developed to ensure that any revenues from commercial endeavour using the facilities are recycled back to support and develop the facilities.

The sustainability use of the facilities also hinges on available human resources capacity to operate and use the materials and equipments, including expensive equipments. Lack of sufficient personnel with adequate skill is one of the deficiencies of the project, and hence reduce the effectiveness of the project.

Another concern is on the current use of the facilities as compared to the intended beneficiaries when the project was initiated. The use has been mostly confined to the medical school where it should have been also used by the forestry, agriculture and natural science schools. However, the mechanism for a more integrated use of the facilities by several parties has to be carefully planned to ensure its sustainability. For example, which school would then be responsible for the operations and maintenance of the facility, and how should the cost sharing be divided among the relevant parties if the facilities are to be jointly utilized.