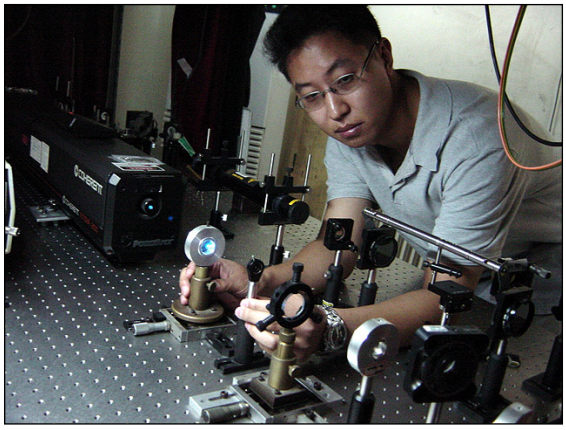
Korea

Education Facilities Expansion Project (2)

Field Survey: August 2003

1. Project Profile and Japan's ODA Loan

Project Site



Argon laser procured under the project

1.1 Background

1.1.1 Phase 2 (KO-40)

a) Procurement of Educational Equipment

With South Korea's rapid economic growth in the 1980s, the demand for highly educated persons grew in terms of both quality and quantity, making the establishment of a higher educational system more important year by year. In the educational sector, schools were not able to deal with the sharp rise in the number of schools, teachers, and students as well as the advancement rate in higher education. Also, the expansion of educational facilities and experimental and training equipment could not keep up with the increase in the demand. For example, the equipment adequacy rate[1] for experimental and training equipment against the standard set by the Ministry of Education has declined at each university as a result of the rapid growth in the number of students. The equipment adequacy rate was particularly low for medical, dental, pharmaceutical, engineering and agricultural universities and special educational institutions.

b) Construction of Celestial Hall

The South Korean government was making efforts to increase the number of prospective science technicians to achieve its goal of creating an advanced industrial society. To this end, the government considered it important to get young people interested in and increase their understanding of science through the introduction of state-of-the-art equipment in physics, mathematics, geosciences, astronomy and space science.

[1] Adequacy rate: monetary amount = total price of equipment owned by each university at the time of purchase ÷ total price of standard experimental and training equipment specified by the government
number = total number of items of equipment owned by each university ÷ total number of items of standard experimental and training equipment specified by the government

1.1.2 Phase 3 (KO-47)

In the 1980s, universities of science and engineering in South Korea gave priority to the increase and improvement of experimental and training equipment at the undergraduate level; therefore, graduate schools did not have adequate equipment, which constituted an obstacle to develop human resources and research activities to respond the development of science and technology.

In specialized universities and open universities that train middle-level engineers needed in various industries as well as home economics universities that teach women nutritional science and clothing science, the aging of the existing equipment and shortage of experimental and training equipment were problems.

Also, the Korea Air and Correspondence University, which provides adult workers with higher education, and the Korean Educational Development Institute, which provides educational broadcasting to kindergartens and primary, middle and high schools, suffered a serious shortage of necessary equipment and had difficulty producing educational programs.

In order to improve the quality of education, the South Korean Government began accepting assistance from other countries to resolve the shortage of educational facilities and equipment and renew creaky equipment.

1.2 Objectives

The objective was to help improve the quality of education by providing education facilities such as universities with necessary equipment, and enhance the understanding and interest of the general public towards science and technology by constructing Celestial Hall, and thereby contribute to the development of human resources in South Korea.

1.3 Output

1.3.1 Phase 2 (KO-40)

a) Provision of educational, research and training equipment to the educational facilities listed below:

1) Medical and dental schools of 14 universities that have university hospitals (13 medical schools and 3 dental schools): 168 items of equipment

2) 45 universities (engineering department of 34 universities, agricultural department of 21 universities and pharmaceutical department of 14 universities): 2,140 items of equipment

3) Special education institutions (93 schools for visually or hearing impaired, etc., department of special education of 4 universities, and 104 special schools): 147 items of equipment

Among 52 universities covered by 1) and 2), excluding overlap, 16 are national universities, 1 is a public university and 35 are private universities[*3]. 3) covers 89 schools comprising 25 national schools and 64 private schools.

b) Construction of Celestial Hall and installation of equipment at the National Science Museum in

[3] In the case of national and public universities, equipment purchased with ODA loans are directly provided to each university and repayment of the loans is covered by the budget of the Ministry of Education. On the other hand, private universities purchase equipment with sub-loans extended by the Ministry of Education on the same terms and conditions as the ODA loans and repay the Ministry with their own funds.

Daejeon

1) Construction of Celestial Hall (slated dome screen with a diameter of 23m, 270 seats, 1,600m^2)
2) Installation of equipment (a planetarium system and software, whole visual angle projection system and 2 films)
3) Technical training (34M/M)

1.3.2 Phase 3 (KO-47)

Provision of educational, research and training equipment to the educational facilities listed below. (This is the first time for items to be provided except for graduate schools of engineering, which were provided with equipment in Phase 2. All schools under categories 2) to 4) below were covered by the project because of serious equipment shortages):

1) Graduate schools of science and engineering (28 including 5 private universities): 568 items of equipment
2) Specialized universities (120 including 103 private universities) and open universities (6 including 3 private universities): 892 items of equipment
3) Educational broadcasting institutions (Korea Air and Correspondence University and Korean Educational Development Institute): 29 items of equipment
4) Home economics universities (66 including 47 private universities): 116 items of equipment

1.4 Borrower/Executing Agency

Phase 2 (KO-40): Government of the Republic of Korea/Ministry of Education (current Ministry of Education and Human Resources Development), National Science Museum
Phase 3 (KO-47): Government of the Republic of Korea/Ministry of Education (current Ministry of Education and Human Resources Development)

1.5 Outline of Loan Agreement

	Phase 2 (KO-40)	Phase 3 (KO-47)
Loan Amount Loan Disbursed Amount	12,911 million yen 12,092 million yen	5,920 million yen 5,752 million yen
Exchange of Notes Loan Agreement	March 1987 August 1987	April 1988 June 1988
Terms and Conditions -Interest Rate -Repayment Period (Grace Period) -Procurement	 4.25% 25 years (7 years) General untied	 4.25% 25 years (7 years) General untied
Final Disbursement Date	August 1992	August 1993

2. Results and Evaluation

2.1 Relevance

2.1.1 Relevance at Appraisal Time

In the 1980s, the South Korean Government in its 5th Five Year Plan (1982-1986) emphasized the expansion of opportunities for education, improvement of the quality of education, increase in investment in education, and promotion of education in science and technology as important issues in education sector. Improvement of the quality of education and development of human resources in the field of science and technology were also among the basic policies of the 6th Five Year Plan (1987-1991). Under the 6th Five Year Plan, 20.2% of the government budget was allocated to education. This project was designed by the Ministry of Education[*4] and the National Science Museum, reflecting the high priority placed on education by the government and the basic policies set forth in the Five Year Plans. Therefore, the project was consistent with the policies of the South Korean Government at the time and was considered relevant.

2.1.2 Relevance at Evaluation Time

The South Korean Government has been attaching importance to education sector since appraisal, as evident by the high percentage of the general account budget allocated to education. The percentage was between 19.5%-24.0% from 1993 to 2001. In 2002 as well, the education budget accounted for 19.6%, the second largest portion of the national budget after economic development (25.9%). Under the slogan of "National Prosperity Based on Education," the South Korean Government is committed to structural reform at every level of education. The government puts emphasis on higher education, particularly the education of human resources who can contribute to the development of science and technology. The "Brain Korea 21 Plan" adopted by the Ministry of Education and Human Resources Development in June 1999 sets the goal of producing the world-class scientists that South Korea needs in the 21st century. Plan targets include having more than 1,300 people receive doctoral degrees in engineering every year starting from 2005 and to rank among the top 10 countries in the Science Citation Index[*5]. Among a total of 1.2 billion dollars budgeted for the Plan for 7 years from 1999 to 2005, 260 million dollars are to be spent on research and training equipment. The "Education in Korea 2001-2002" and other programs also give high priority to improving the quality of higher education, mainly in science and technology. Therefore, this project has remained relevant to date.

2.2 Efficiency

2.2.1 Output

Celestial Hall, which was constructed in Phase 2, has been completed almost as planned in terms of scale and equipment procured. As for the procurement of educational equipment, the categories of target schools and departments have not changed from appraisal and the types and quantity of the equipment were adjusted at the procurement stage both in Phase 2 and Phase 3 in response to changing needs resulting from technological innovation .

[4] Current Ministry of Education and Human Resources Development
[5] Annual number of papers published, or citation of high-level scientific papers (SCI papers)

2.2.2 Project Period

Construction of Celestial Hall in Phase 2 was completed as planned in the second quarter of 1989. However, the procurement of educational equipment in Phase 2 and Phase 3 was delayed by about 4 years each. This was because the equipment procured under the project exceeded 10,000 items in Phase 2 and 2,000 items in Phase 3 and it took time to change and obtain approval for the list of equipment to be procured. In addition, it took longer than expected to conclude contracts with various contractors and procure equipment. Another factor is the delay in the payment of customs fees by some private universities due to lack of funds.

2.2.3 Project Cost

The cost of Phase 2 was estimated at 15,729 million yen at appraisal. The ODA loan was to finance the entire foreign currency portion, which accounted for 82.1% of the total project cost. The foreign currency portion was to cover CIF prices[*6] of equipment and the cost of overseas training on the operation and maintenance of Celestial Hall. The local currency portion to cover customs fees, customs duties, inland transportation, insurance, taxes and public charges was to be borne by the South Korean Government, each private university and the National Science Museum that operates Celestial Hall. The ODA loan was used to cover the entire foreign currency portion as planned, and a total of 12,092 million yen, or 93.7% of the approved amount was disbursed. The information on the local currency portion paid by the South Korean side was not available.

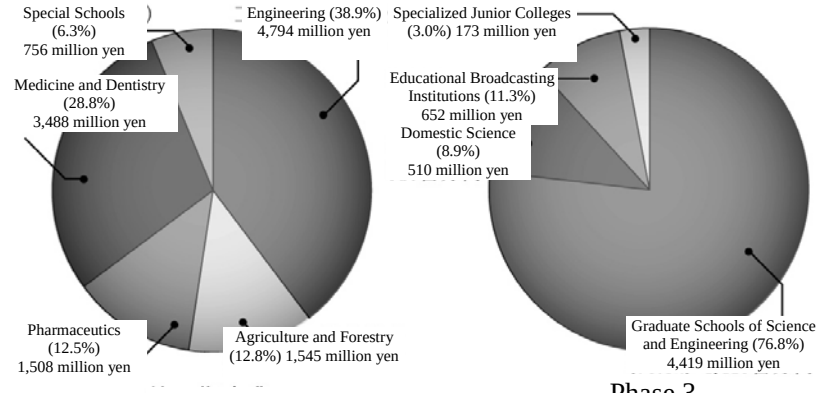
The cost of Phase 3 was estimated at 7,211 million yen at appraisal. The ODA loan was to finance the entire foreign currency portion, which was to cover CIF prices of equipment, while the local currency portion for customs duties, inland transportation, etc. was to be borne by the South Korean Government and each private university. The ODA loan was to cover 73.4% of the total project cost. The ODA loan was used to cover the entire foreign currency portion as planned and a total of 5,735 million yen, or 96.9% of the approved amount was disbursed. The information on the local currency portion paid by the South Korean Government and each private university was not available.

2.3 Effectiveness

2.3.1 Expansion of Educational Equipment for University Departments and Educational Facilities

In Phase 2 and Phase 3 of this project, experimental and training equipment worth a total of 17,845 million yen were procured for national, public and private universities, graduate schools, specialized junior colleges, special schools and educational broadcasting institutions. The higher education institutions covered by Phase 2 and Phase 3 (106 schools) comprise 23% of all higher education institutions in South Korea (459 schools). Fig.1 shows the breakdown of the equipment procured under the project by university department and field of study in terms of prices.

[6] CIF price (Cost, Insurance, and Freight Price): price including the price of equipment, insurance and freight to the point of import



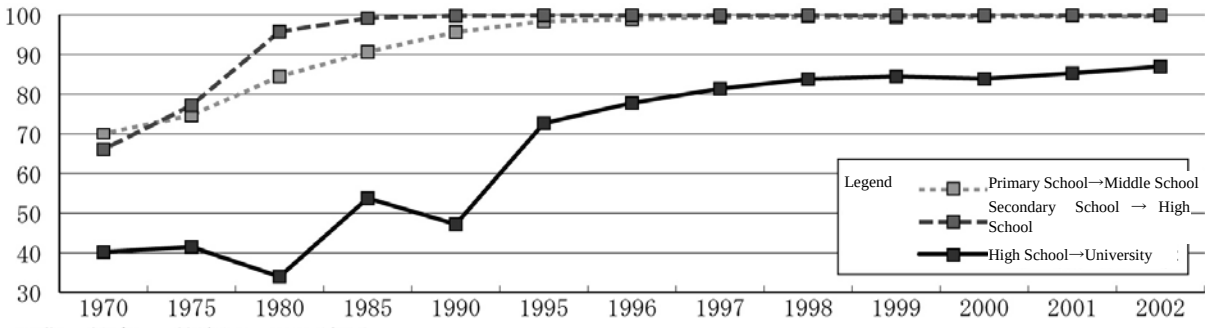
Phase 2 Phase 3

Source: Data by Ministry of Education and Human Resources Development

In Phase 2, engineering, medical and dental, and pharmaceutical universities accounted for large percentages, 38.9%, 28.8%, and 12.5%, respectively, of the total amount of equipment procured. In Phase 3, equipment procured for graduate schools of science and engineering made up 76.8% of the total. In both phases, most of the equipment costs were for science and engineering departments and medical, dental and pharmaceutics schools that require expensive equipment for research and training.

2.3.2 Rapid Increase in University and Graduate School Students and Equipment Adequacy Rate

Figure 2 shows advancement rates to secondary school, high school and university. The advancement rate to secondary school has been nearly 100% since 1990 because secondary school became compulsory in 1991. Although high school is not compulsory, the advancement rate to high school has exceeded 99% since 1997.



Source: Data from Ministry of Education and Human Resources Development

Fig.2 Changes in Advancement Rates in South Korea

The advancement rate to university increased from 47.2% in 1990, 6 months after the procurement of equipment started under Phase 2 of the project, to 72.7% in 1995, one year after the completion of Phase 3, and has since been growing. With the rapid increase in the advancement rate to university, that to graduate school is also thought to be increasing, though no data is available.

At the appraisal of Phase 2 and Phase 3 of the project, the South Korean Government was not able to deal with rapid increase in students. Higher education institutions' (universities, graduate schools and

specialized junior colleges) equipment adequacy rate[7] for experimental and training equipment against the standard set by the Ministry of Education was as low as 43.9% in 1985 in terms of the number of items of equipment. The rate in 1993 when Phase 2 was completed was 59.6% and that in 1994 when Phase 3 was completed was 65.0%, marking a substantial increase in the adequacy rate in terms of the number of items of equipment.

As of the end of 2002, the equipment adequacy rate of national and public universities was 76.0% and that of national and public specialized junior colleges was 101.2% (that of private universities is unknown because there is no standard for experimental and training equipment for private universities). The improvement in equipment adequacy rate is considered the result of 4 ODA loan projects (including this project) since 1980 [8], a project by the Asian Development Bank and 5 projects by the World Bank, under which educational equipment worth a total of 546.48 million dollars was provided to higher education institutions. The amount of 101.09 million dollars allocated to the purchase of equipment for higher education institutions during the implementation of Phase 2 and Phase 3, accounted for 18.5% of the total amount of loans from foreign countries during that period and contributed greatly to improving the equipment adequacy rate.

2.3.3 Improvement of the Quality of Education through Experiments and Training-Oriented Education

The educational equipment procured under this project are used on various occasions in daily classes, experiments, and practical training and contributed to improve the quality of education. This section gives examples of how the equipment procured is used by medical and dental schools and graduate schools of science and engineering, which received particularly intensive support. The information was obtained from each university during the field survey for this evaluation.

a) An example of equipment procurement for graduate schools of science and engineering (Korea University)

Korea University procured equipment worth 112 million yen under Phase 2 and 116 million yen under Phase 3 of the project. The argon laser installed at the department of physics in June 1992, for example, is relatively expensive, costing about 3.93 million yen at that time. This equipment is working well today[9] even though use of the plasma tube has exceeded the supposed service life of 5,000 hours. The argon laser is indispensable for physics research and is used by 20-30 graduate school students and 2 doctoral students for research and training.

Photo 1: Optical Microscope

The precision optical microscope procured in February 1990 under Phase 2 of the project (Photo 1) has been used to date at the laboratory of the division of material engineering, college of science. Presently it is used for research on silicon–based Random Access Memory (RAM)[10]. This equipment is used at least 3 times a week or even more frequently when there are many samples to

[7] Total number of items of equipment owned by each university ÷the standard for the number of items of experimental and training equipment set by the government×100

[8] Educational Facilities Expansion Project (1)･(2)･(3) and Fisheries and Maritime Education Facilities Expansion Project

[9] This equipment is used to analyze nonlinear optical response by aligning the molecular structure of thin polymer film in a certain direction.

[10] The space between memory cells printed on the surface of semiconductors determines capacitance of semiconductors. The space must be minute in order to obtain the expected performance. Therefore, examination of products during manufacture and completed products using this microscope is indispensable for the study of semiconductor memory.

analyze.

b) An example of equipment procurement for dental and medical schools (Singu College)

In Phase 3, equipment worth 14.06 million yen was procured for Shingu College and installed in 1990. The 11 items of 8 types of educational equipment have been used for classes and practical training in the 4 departments of dental technology, dental hygiene, radiology and somatotherapy. 4 of them are still there, including the X-ray machine, which is used today.

Photo 2: X-ray machine

This X-ray machine (39,000 dollars at that time, see Photo 2) was the most expensive item of the equipment procured with the ODA loan. The college now has 2 X-ray machines. The one procured with the ODA loan is mainly used to examine bones and the other is to examine internal organs. The procured machine is in good condition and is used 4 days a week to train all grades (1-3) of students.

Photo 3: A class using ultrasound

The ultrasound diagnostic equipment (2,985 dollars) procured with the ODA loan was used until 2001 in the classes for the 3rd grade students of the department of radiological therapy. The ultrasound diagnostic equipment is used in 8 classes a week (Photo 3). Three newly purchased ultrasound diagnostic equipment are mainly used now.

The ODA loan was provided when the college had difficulty raising funds to purchase equipment. Thanks to the loan, the college was able to acquire equipment necessary for practical training. The medical departments of the college offer the highest level of education among junior colleges in South Korea. The college enjoys a high employment rate of graduates and generates a large number of doctors, dentist and dental technicians.

2.3.4 Celestial Hall (Planetarium and Astrovision[*11] Theatre)

In Phase 2, Celestial Hall (planetarium and Astrovision facility) was constructed at the National Science Museum in a suburb of Daejeon [*12]. The Celestial Hall started operations on October 9, 1990 with the opening of the National Science Museum. The Hall is the largest of its kind in South Korea[*13] with a dome diameter of 21.5m and 242 seats. It is one of 2 facilities in South Korea that is both a planetarium and an Astrovison facility.

The number of visitors to the National Science Museum has been greatly exceeding the appraisal target of 500,000-600,000. In 1993, when the Daejeon EXPO'93 was held, it had 1.43 million visitors. Although the visitors decreased to 830,000 in the following year of 1994, the number of visitors has remained higher than the target set at the planning stage (see Fig. 3).

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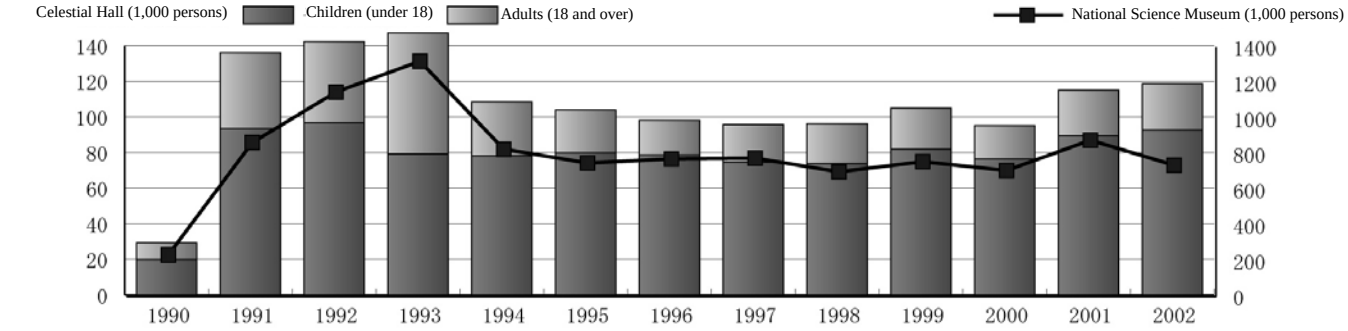
[11] Astrovision: whole visual angle projection system with one-lens projection. Like a planetarium, this system displays high-resolution images extending beyond the field of vision of humans on a screen inside a dome with an area several times larger than a movie theatre.

[12] A 20ha complex of facilities constructed in a suburb of Daejeon, where many national research institutes are located based on the concept of "harmony among nature, human and science". Exhibitions are divided into 4 categories: natural history, history of science and technology, natural science, and technology.

[13] As of August 2003, there were 23 planetariums in South Korea, including 10 that were constructed after the completion of Celestial Hall. The second largest one after Celestial Hall was constructed in 2001. It has a dome with a diameter of 15m and 150 seats.



Data by National Science Museum

Fig.3: Changes in the Number of Visitors to the National Science Museum and Celestial Hall

Photo 4: Outside appearance (left) and inside (right) of Celestial Hal

Changes in the number of visitors to Celestial Hall[*14] are similar to changes in the number of visitors to the National Science Museum. The data show that one out of 7.5 visitors to the National Science Museum visited Celestial Hall. The number of visitors to Celestial Hall was 135,000 in 1991, the year after its opening, 142,000 in 1992, and 147,000 in 1993. After that, it has been hovering between 95,000 to 120,000. Now, 13 years since its completion, it still attracts many people. Judging from the fact that 75.3% of the total visitors as of the end of July 2003 were under 18 years old, the Hall contributed to achieve the project objective of enhancing young people's understanding and interest in science and technology.

Celestial Hall is open 300 days a year on average excepting Mondays and days following national holidays, presenting 5-6 shows a day. In addition to planetarium shows, it shows various video programs on natural science on Astrovision, such as "Space Development in the Future," "Eruption of Mt. St. Helens" and "Space Voyage." In addition to these regular shows, special events such as lectures on astronomy, how to use an astronomical telescope, and how to find constellations are held 3-4 times a month. Applications to participate in these events are accepted via the Internet and reach the limit 500 persons in 2-3 days every time, showing that these events are very popular.

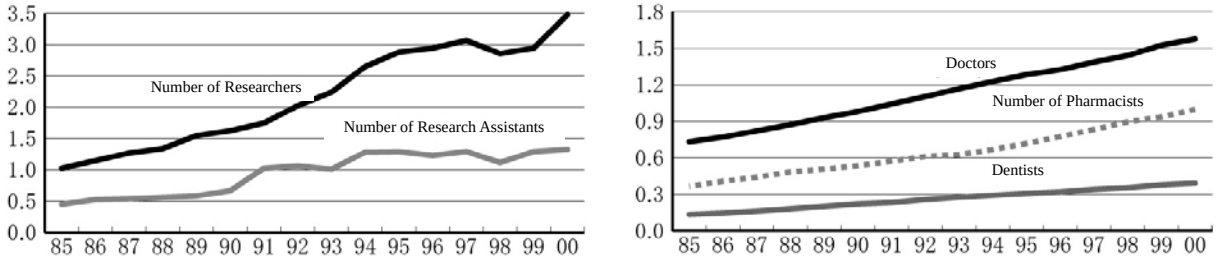
2.4 Impact

2.4.1 Supply of Human Resource to Science and Technology Sector and Medical Sector

Procurement of educational equipment for science universities and graduate schools of science and engineering in Phase 2 and Phase 3 and construction of the planetarium in Phase 2 were expected to develop human resources in specialized areas of science and technology and enhance the understanding and interest of the general public, mainly young people, in science and technology, thus increasing the number of prospective science technicians. These project objectives reflect the recognition by the South Korean Government that development of human resources in science and technology is indispensable to create an advanced industrial society.

[14] These data do not include annual members who can enter for free by paying a membership fee. The number of annual members reached a total of 13,000, including both family and individual members, in 2003. Therefore, the actual number of visitors is thought to be larger than these figures.

Fig.4 shows changes in the number of researchers and medical professionals per 1,000 people. The chart on the left shows the number of researchers and research assistants has increased sharply. This seems to prove that procurement of educational equipment for science and engineering universities and graduate schools and construction of Celestial Hall under this project, as well as various measures and projects implemented by the South Korean Government, have generated good results.
Also, as shown in the chart on the right, the number of medical professionals, who were in short supply in the 1980s, has also increased substantially.



Source: Data from the Korea National Statistical Office

Fig. 4: Changes in Number of Researchers and Medical Professionals per 1000 People

Provision of equipment to higher education institutions in the fields of science & engineering and medicine & dentistry under this project seem to have contributed in supplying personnel to the science and technology and the medical sectors.

2.4.2 Transfer of Technology for Development of Software for Planetarium and Astrovision

, For the operation and maintenance of Celestial Hall and software development technology, training was provided both in domestic and overseas in Phase 2 of the project for the purpose of technological transfer. In Phase 2, 1 type of software for the planetarium and 2 types of software for Astrovision were provided with the ODA loan. Partly as a result of the training program on software development provided in Japan, 5 and 1 types of software for each were developed by the Korean side on its own. The technology on operation and maintenance was also transferred.

2.5 Sustainability

2.5.1 Executing Agency

(1) Technical Capacity and Operation and Maintenance System

No problem was found in technical capacity and the operation and maintenance system of the executing agency.

(2) Financial Status

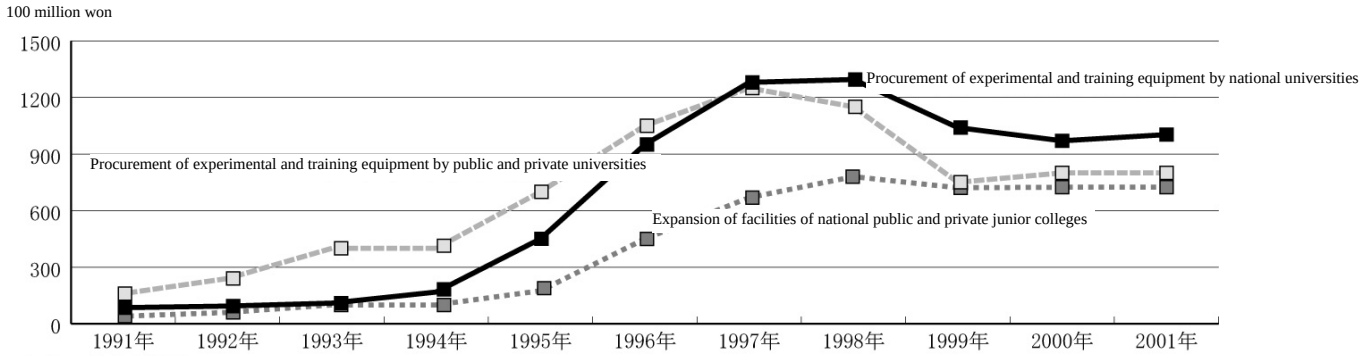
a) Educational Equipment

Fig.5 shows changes in the amount of government subsidies allocated to expand equipment at higher education institutions. A substantial increase can be seen in the mid-1990s when disbursement of foreign loans for educational equipment completed. Then the amount declined from 1998 to 1999. This decline seems to be due to the austerity measures implemented following the recommendations by the International Monetary Fund (IMF) in 1998 to help the country emerge from the crisis triggered by the

Asian currency crisis. In addition to these subsidies, each university uses part of the tuition and equipment maintenance fee collected from students to purchase and maintain equipment.

With the aim of further improving the quality of education at universities and graduate schools that are the main target of this project, the Ministry of Education and Human Resources intends to increase the educational budget per student from the 3,000 dollar level in 2001 to 10,000 dollars in 2010. [*15]

Fig. 5: Changes in the Amount of Government Subsidies to Higher Education Institutions for Procurement of Equipment



Source: Data from Ministry of Education

b) Celestial Hall

The revenue of the National Science Museum and Celestial Hall for FY 2002 (admission fees, parking fees, etc.) was 70 million yen, only 6.5% of the total expenditure of 1,150 million yen. The remaining expenditure is covered by government funds. It is because they are non-profit public facilities and therefore the admission fees are fixed at a low level equivalent to 20-50 yen. According to the staff in charge, the amount of budget for operation and maintenance is almost, though not quite, sufficient, and there is no major problem with operation and maintenance of the facilities.

2.5.2 Operation and Maintenance Status

With regard to the operation and maintenance of educational equipment procured under this project, surface cleaning after use and a brief overhaul cleaning are performed by the users and persons in charge at each university. Repair in the event of failure, procurement of spare parts and periodic inspections of large machines are conducted by companies contracted by each university or the agents of the manufacturers. In some cases, the production of spare parts has been discontinued and therefore parts cannot be replaced. However, considering those machines were purchased more than 10 years ago, such situation may be inevitable.

As for the Celestial Hall, constructed in Phase 2, maintenance is performed by the Hall staff and local building interior furnishing and construction companies. With regard to operation and maintenance and tuning of the projectors that require special equipment, the supplier visits South Korea to perform maintenance 2 times a year, 6 days in total.

[15] Source: Education in Korea 2001- 2002, Ministry of Education and Human Resources Development

3. Feedback

3.1 Lessons Learned

None

3.2 Recommendations

None

Comparison of Original and Actual Scope (KO-40)

Item	Plan	Actual
I. Output		
A. Procurement of educational equipment		
1) University hospitals	14 universities 168 items 2,005 units	1university 634 items 634 units
2) Engineering/agriculture and	45 universities 2,140 items 3,911units	46 universities 3,095 items 6,898 units
forestry/pharmaceutical universities	93 universities 147 items 6,797 units	15 universities 125 items 125 units
3) Special education		
Total	191 schools 2,455 items 12,713 units	65 schools 6,809 items 7,657 units
B. Construction of Celestial Hall		
1) Construction of Celestial Hall	1,600 m^2, 270 seats	As planned
2)Installation of equipment		
- Planetarium system and software	1 set	As planned
- Whole vision angle projection system	1 set	As planned
- Software (film)	1 set	As planned
3) Technical training	34 M/M	As planned
II. Project Period		
A. Procurement of educational equipment		
1. Determination of loan amount	3rd Qr. 1987	4th Qr. 1987 - 3rd Qr. 1992
2. Tender call	1st Qr. 1988 - 3rd Qr. 1988	2nd Qr. 1989 - 4th Qr. 1991
3. Tender evaluation, contracts, L/C opening	2nd Qr. 1988 – 4th Qr. 1988	2nd Qr. 1989 - 4th Qr. 1992
4. Customs clearance, inland transport, installation	1st Qr. 1989 - 3rd Qr. 1989	1st Qr. 1989 - 2nd Qr. 1993
B. Construction of Celestial Hall		
1. Determination of loan amount	2nd Qr. 1987	As planned
2. Tender call	3rd Qr. 1987 - 4th Qr.1987	As planned
3. Tender evaluation, contracts, L/C opening	1st Qr. 1988	As planned
4. Customs clearance, inland transport, installation	1st Qr. 1989 - 2nd Qr. 1989	As planned
5. Construction of Celestial Hall	1st Qr. 1987 - 4th Qr.1988	As planned
6. Training	1st Qr. 1988 - 2nd Qr. 1989	As planned
III. Project Cost		
Foreign Currency	12,911 million yen	12,092 million yen
Local Currency	15,981 million yen	Unknown
	(3,070 million won)	Unknown
Total	15,729 million yen	Unknown
ODA Loan Portion	12,911 million yen	12,092 million yen
Exchange Rate	1 won＝0.176 yen (1987)	

Comparison of Original and Actual Scope (KO-47)

Item	Plan	Actual
I. Output		
1. Number of target universities		
- Graduate schools of science and engineering	28 universities (5 private universities)	34 universities（4 private universities）
- Specialized universities/open universities	126 universities (106 private universities)	5 universities（4 private universities）
- Home economics universities	66 universities (47 private university)	1 university（1 private university）
- Educational broadcasting institutions	2 institutions	1 institution
2. Number of items of equipment procured		
- Graduate schools of science and engineering	568 items	1,436 items, 2,920 units
- Specialized universities/open universities	892 items, 2,823 units	144 items, 237 units
- Home economics universities	116 items, 183 units	438 items, 612 units
- Educational broadcasting institutions	29 items, 82 units	71 items, 165 units
II. Project Period		
1. Determination of loan amount	4th Qr. 1987 - 1st Qr. 1988	1st Qr. 1988 - 4th Qr. 1988
2. Tender call	2nd Qr. 1987 - 4th Qr. 1988	3rd Qr. 1989 - 3rd Qr. 1992
3. Tender evaluation, contracts, L/C opening	3rd Qr. 1988 - 1st Qr. 1989	4th Qr. 1989 - 3rd Qr. 1993
4. Customs clearance, inland transport, installation	2nd Qr. 1989 - 4th Qr. 1989	2nd Qr. 1990 - 1st Qr. 1994
III. Project Cost		
Foreign Currency	5,920 million yen	5,753 million yen
Local Currency	1,291 million yen	Unknown
	（7,103 million won）	Unknown
Total	7,211 million yen	Unknown
ODA Loan Portion	5,920 million yen	5,753 million yen
Exchange Rate	1 won＝0.182 yen (1988)	

Third Party Evaluator's Opinion on
Educational Facilities Expansion Project (2)(3)

Dr. Taeho KWON
Associate Professor, School of Construction Engineering
Semyung University

Relevance

As reported, goal of the loan project is twofold: 1) to expand educational facilities and experimental/training equipments to flexibly respond to the growing higher educational demands, and 2) to contribute to the interest of youngsters on the significance of science and technology through the construction of Celestial Hall with installation of a planetarium.

The overall relevance of the project at appraisal time is possibly justified when reviewing the report as well as 5th and 6th national development plans (1982-1991). However, the relevance at evaluation time needs to be more critically discussed from the perspective of recent changes in the government's science and technology policies as well as in socio-economic environments.

According to Mid-/Long-term Plan for National Science and Technology (1999) and National Comprehensive Plan for Science and Technology (2002-2006), it has been attempted to strengthen technology innovation capacities in the strategic sectors and an innovation system of science and technology for the realization of knowledge-based society. For the purpose, the critical propelling tasks, including (i) investment expansion of fundamental researches, (ii) of science and technology training/education, and (iii) support of local universities, were suggested. In this vein, "Brain Korea-21 Plan" and selection of strategic sectors such as IT, BT, NT are emphasized as vehicles for achieving the tasks.

Nonetheless, the results of these ambitious plans are not seemed to be satisfactory enough due to the following socio-economic factors, which, in turn, presumably lower-down long-term efficiency and effectiveness of the loan project. Since the financial crisis in 1997, the milieu of demand-side domestic labor market in the private sectors has been aggravated along with industrial restructurings and massive relocation of manufacturing factories to Asian developing countries such as China and Vietnam. "Death of domestic manufacturing sector", primarily due to the skyrocketing of labor cost, has resulted in the shrinking of employment market for university/college graduates studied science and technology majors. In particular, those majored basic sciences have encountered more difficulties in getting proper jobs after graduation.

The mismatch between demand and supply is further worsened by excessive labor supply of university graduates. As of 2003, total number of graduates majored science and technology fields was 67,000 (remarkably more than that of Germany, 39,400 pers.) and only 50% of them were employed. Another interrelated factor is so called "evasion of science- and technology-associated fields" among university/college applicants. The phenomenon is seen as the result of the interplay between the scaling-down of employment opportunities and decrease of total number of high school graduates.

Under the socio-economic circumstances, at least two prerequisites should to be tackled in order to maintain the long-term efficiency and effectiveness of the loan project: (i) size(i.e. total number) of science/technology-associated fields in universities/colleges should be more flexibly controlled and responded to the fluctuation of demand-side markets; and (ii) science and technology education/training system including curricula should be restructured and updated to reflect rapidly changing industrial as well as labor structures.