Education and Human Resources Development

CONSTRUCTION EQUIPMENT TRAINING CENTER

1. Program Summary and JICA's Cooperation

Site: Colombo

Photo: Construction Equipment Training Center

(1) Program Background

Sri Lanka Government had promoted 14th Five Year Public Investment Plan (1992-1996) to reinforce and expand infrastructures for such as electric power supply, communication and transportation. As a result, the country possessed more than 6,000 of construction machines. However, because Sri Lankans did not have enough knowledge and skills concerned with maintenance engineering for those machines due to the lack of systematic training, the capacity utilization of those machines had remained approximately 40 %. Although Sri Lanka had training facilities to train operators of construction machines, those facilities were not capable to train supervisors or mechanics for those machines systematically. Consequently, the government had not been able to methodically respond the needs for human resources from the nation's construction industry. Under these circumstances, to proceed further plans to provide infrastructures, Sri Lanka Government designed to establish a training center to develop human resources for maintenance and management of construction machines. And the government sought Grant Assistance (referred to "GA" in the following) to construct the center and Technical Assistance (referred to "TA" in the following) for its training from Japan.

(2) Program Objectives and Overall Goal

This program was implemented to develop human resources concerned with management and maintenance of construction equipment at Construction Equipment Training Center (referred to "CETC" in the following), and consequently to improve the operative efficiency of construction equipment in the overall construction sector.

(3) Program Scope

The outcomes of this program are the following: improvement of ability of supervisors and site managers in charge of operation, management and maintenance of construction equipment, development of human resources who are capable to efficiently operate construction equipment and capable to design and implement management plans for the equipment, improvement of the efficiency of various construction machines, construction of the CETC to respond the increasing needs for further infrastructures, acquisition of machinery and materials for training, maintenance of machineries for training courses, establishment of training system, and technical support and technology transfer to establish and sustain the operation system of the CETC.

(4) Program Component

This program consists of the following projects.

- The Project for Establishment of Construction Equipment Training Center
  (GA: 1.869 billion yen in fiscal 1994, 688 million yen in fiscal 1995)
- Construction Equipment Training Center in Sri Lanka
  (Project-type Technical Assistance (referred to "PTA" in the following) implemented from October 1996 to September 2001)

(5) Executing Agency

Ministry of Housing & Urban Development and Institute of Construction Technology (The present Ministry of Hosing & Plantation Infrastructure and Institute of Construction Technology)

(6) Present Status of the Program/Viewpoint for Evaluation

This program was finished in September, 2001 when the PTA of "Establishment of Construction Equipment Training Center" was completed. In May, 2001, an investigation team was sent to the country for the Completion Evaluation of the PTA and they submitted an evaluation report in June, 2002. In this report, Ex Post Evaluation was carried out basically in accordance with "JICA Program Evaluation Guideline" (September, 2001).

2. Evaluation Results

(1) Relevance

In the section of "Construction Field" in its "Six Year Development Plan" (1999-2004), Sri Lanka Government says "it is necessary to improve the efficiency of construction industry". As one of the measures to realize it, the government also says "planning for human resources development and improvement of education shall be required". The objectives of the program of CETC adhered to this national development plan, aiming to train supervisors and mechanics to acquire enough practical knowledge and skills concerning operation, maintenance, management and planning for construction machines, which are essential to the construction industry.

Also, the Completion Evaluation of the PTA carried out in May, 2001 confirmed the necessity to improve the operative efficiency of construction equipment and education for the construction industry by national development plans and others.

(2) Effectiveness

As shown in the following table, to evaluate the effectiveness of this program which aimed human resources development for operation, maintenance, management and planning for construction equipment, we used the ratio of the actual number of graduates to the annual target of the number of graduate in order to see how the number of graduates has increased. An annual target is yearly set for each training course. In each course of Basic Mechanic, Mechanic II and Mechanic III which train from technicians to engineers for maintenance of construction equipment, the numbers of graduates have increased reaching the annual targets because of the growing demands for human resources for construction sites. Concerning other courses, Supervisor Course and Inventory Management Course recorded 73 % and 85 % respectively in 2001, nearly achieving their annual targets.

The Ratio of The Actual Number of Graduates to The Annual Target
(Concerning seven basic training courses listed in the Minutes of Agreement)

Course Name	Annual Target	1997	1998	1999	2000	2001	Total
Basic Mechanic	100	43 (43%)	77 (77%)	116 (116%)	112 (112%)	119 (119%)	462
Mechanic II	80	—	124 (155%)	137 (172%)	126 (150%)	199 (248%)	586
Mechanic III	48	—	10 (21%)	24 (50%)	70 (145%)	78 (162%)	182
Site Manager	24	—	—	34 (142%)	15 (63%)	30 (125%)	79
Supervisor	70	11 (16%)	31 (44%)	55 (79%)	57 (81%)	51 (73%)	205
Inventory Management	20	—	—	20 (100%)	20 (100%)	17 (85%)	52
Records Management	20	—	—	6 (30%)	17 (85%)	31 (155%)	54
Total	—	54	242	392	417	525	1,632

Source) The Completion Evaluation Report of CETC (May, 2001) by Sri Lanka Programs Evaluation Team (May, 2002)

(3) Efficiency

To examine the efficiency of a JICA program, the actual inputs made in the program and the outputs resulting from those inputs usually compared. In this program, these inputs were made by Japanese Government as the form of GA (constructing the facility and for providing machinery and materials) and as the form of PTA (dispatching experts, accepting trainees and providing a land to construct the CETC), and made by Sri Lanka Government (positioning counterparts and providing a land to construct the CETC). This examination for this program has already made by the Completion Evaluation, confirming that their amounts and quality were suitable to achieve the objectives of this program.

(4) Impacts

4-1) Receiving of Trainees from Neighbouring Countries

Technical Training the CETC offers for operation and maintenance of construction machines is very unique in Sri Lanka in terms of its scale and quality. Neighbouring countries have very few facilities which have similar scale and quality to the CETC. Consequently, the CETC has accepted trainees from neighbouring Republic of Maldives mainly to the courses for engine mechanics in 2001 and 2002, as a Maldivian private company (a water supply company) required. This proves that other countries highly value the technical training offered by the CETC because of its sufficient quality and volume.

4-2) Technology Transfer by Graduates

"The Survey on Construction Equipment" conducted in March, 2001 by the CETC says that the graduates of the CETC return to and work at their companies teaching other employees their acquired skills and techniques as they take leadership positions. It could be said that those graduates are carrying out a kind of technology transfer at many working sites. This means that the CETC indirectly trains many supervisors or mechanics for construction machines in many construction sites. This is a highly valued ripple effect of this program, because it contributes to develop human resources not only for the construction industry but also for overall economy in the nation.

(5) Sustainability

5-1) Financial Aspect

Although Sri Lanka Government currently allocates 1 billion rupees as the annual budget to the CETC, the amount the CETC actually needs is approximately 1.8 billion rupees annually including labor costs (approx. 500 million rupees), operational expenses (approx. 530 million rupees), and maintenance expenses (approx. 770 million rupees). Meanwhile the CETC annually earns approx. 370 million rupees including tuition and earnings from seminars which the CETC held in outside, contracts for repairing machines and trainees accepted from other countries. Therefore the CETC actually needs approx. 430 million rupees to fill the shortage of the annual budget which now causes insufficient maintenance of the facilities and machines. Main cause of this shortage is that, because of its financial conditions, Sri Lanka Government does not grant 1.5 billion rupees as the annual budget which Japanese Government and Sri Lanka Government agreed in November, 2000 signing on the Minutes of Agreement concerning the CETC (PTA). To ensure its independence and consistency, the CETC can ask for the necessary budget, and can also increase earnings including tuition and others from outside taking advantage of the superiority of the CETC within its original tasks as a training center. Furthermore, to increase earnings, the CETC is able to utilize the Construction Businesses Training Support Meeting held by the CETC and the construction industry, which was started in this program, establishing mutual cooperative relationship with the industry and understanding the needs from the industry for technical training.

5-2) Organizational Aspect

At the CETC, some management positions have not been filled, and some training staff members have left. To maintain its sustainability, it is important to ensure human resources. Concerning the management positions, job offers have been made using newspaper advertisements, and currently the CETC is waiting the result. Meanwhile,

although the number of resigned employees has decreased, to prepare the shortage of training staff and to efficiently operate training courses, a backup system is established in each training course in which a training staff member takes charge more than one training course in other fields. In this system, training staff is able to sufficiently experience in other fields developing various techniques.

5-3) Systematic Aspect

The CETC has prepared the draft of NSS (National Skill Standard) for maintenance of construction equipment. Currently NAITA (National Apprenticeship and Industrial Training Authority) and the construction industry is reviewing and revising it, and is also finishing the designing of the NTT (National Trade Test) system. The system, which will be enforced within six months, will contribute to improve quality and techniques for construction equipment in Sri Lanka. Also because the system will officially prove the technical ability of the graduates of the CETC, applicants for the CETC would increase, and the needs for the CETC from the construction industry would growing further.

The financial and organizational problems mentioned above can be resolved by the CETC itself. Therefore it is considered that the CETC is sustainable.

(6) Other achievement

6-1) Grant Assistance

In the GA that has been made in this program, minor technical assistance was made to prepare manuals of machines and to carry out other tasks. However, further technical assistance that should be evaluated was not implemented.

6-2) Project-type Technical Assistance

It has been highly valued that the technology transfer made to launch the training system of the CETC. However it is also true that the technical support to assist to maintain the transferred technologies in Sri Lanka was insufficient especially after despatched experts return to Japan.

Considering the matters mentioned above, it is considered that the overall goal of technical assistance made in this program was efficiently achieved. However, the problem of how to maintain transferred technology remains.

(7) Conclusion

This program consists of GA to provide facilities and equipment for the CETC and Technical Assistance as the form of PTA to establish its curriculum. The CETC

significantly contributes to develop human resources for operation and maintenance of construction equipment, taking advantage of its superiority in its scale and quality over other training facilities in Sri Lanka and neighbouring countries, and accepting trainees which number has exceeded its target. Also the CETC has also accepted trainees from neighbouring countries having great impacts on those countries and Sri Lanka itself. However, some doubt remains for the CETC to maintain its sustainability because the original budget has not been granted by Sri Lanka Government, and because its system to maintain and operate its facilities and equipment has not been reinforced.

3. Lesson Learnt

Technical Assistance to Ensure Sustainability :

Because this program mainly consists of PTA, technology transfer has been made by dispatched experts in various fields for five years. These experts technically support Sri Lankans to construct the CETC, to provide its machines and materials, and to establish its operation system and the training system of its training courses. This program completed with sufficient achievements. However, during the five years, technology transfer has not been made to establish a financial and organizational management system of the CETC in order to ensure its sustainability. This is because 34 dispatched experts in a long term and in a short term did not include experts who specialize in fields such as "management", "financial affairs and accounting", "organization and system", "human resources development", "market development" and "public relations". Recently, in many infrastructure projects proceeded especially by Japanese Loan Assistance, technical assistance were also made to ensure the sustainability of the infrastructures made in those projects. We should recognize that this type of technical assistance is being required.

4. Suggestion

Proper Measures and Further Effort :

Because 1.5 billion rupees has not been allocated to the CETC as the annual budget although Sri Lanka Government agreed it with Japanese Government in November, 2001, the CETC is barely maintaining its facilities and machines and reinforcing its management system. To sufficiently take advantage of the superiority of the CETC in its scale and quality over neighbouring countries, proper measures should be taken to ensure necessary budget and to reinforce the system or for other purposes. It is considered that the establishment of NSS and NTT System will be effective to ensure the

economical independence of the CETC.

In conclusion, further effort by the CETC itself should be required to ensure its budget, to develop human resources, to reinforce the relationship with the construction industry, and also to increase earnings.

5. Annex

[PDMe]

Summary	Indicators and Plan/Performances		External Conditions
	Indicators	**Plan/Performances**	
Overall Goal To ensure the normal operation of construction equipment and enhance the social infrastructure such as electricity, communication and transportation	1. Sri Lankan ability to equip the infra-structure in Sri Lanka	No data	
Program Purpose To improve the management efficiency of construction equipment in construction sector … PTA Project Outline List	1. Normal operation rate of construction equipment	・40% (actual data at the time when this program was designed)	
Project Purpose 1. Construction Equipment Training CETC Project (Grand Assistance) Enforcing the ability of Supervisors and Site managers … GA Ex Post Condition List 2. Construction Equipment Training CETC (Project-type Technical Assistance) Developing human resources for operation and maintenance of construction equipment … PTA Completion Evaluation	1. The number of graduates	・500 graduates per year (actual data)	
	2. Rate of employed graduates	No data	
	3. Number of Employees for operation and maintenance of construction equipment	No data	
	4. The operative condition of facilities and equipment	No data	
	5. Implementation of the final exam after the completion of the course	・Implemented in BM Course	
Outputs 1. Construction Equipment Training CETC Project … GA Completion Report	1-1 Management building and Training building	5,152 ㎡(original data)	・To urge the sustainable development of enterprises, appropriate “O&M system”, “Budgets for the

(Facilities) ・Management building and Training building 5,152 ㎡（94） ・Accommodation building, dining building, garage, elevated water tank, connecting corridor 2,029 ㎡（95） (Equipment) ・Equipment for Workshop, training, education, management and vehicles（94） ・Construction equipment（95）	1-2 Accommodation building, dining building, garage, elevated water tank, corridor connecting two buildings	2,029 ㎡(original data)	maintenance and management of facilities or equipment" and "training for staff" are essential.
	1-3 Equipment at repair shops	・List shows (original data)	
	1-4 Training materials	・List shows (original data)	
	1-5 Construction equipment	・List shows (original data)	
2. Construction Equipment Training CETC … PTA Project Outline List ・Establishment the operation system of center ・Establishment of systems in 7 basic training courses and other 8 training courses ・Providing the training equipment	2-1 Condition of training course curriculum	・7 basic training courses (original data)	
	2-2 The number of materials developed for training course	・181 materials/ manuals (actual data)	
	2-3 Implementation of training for C/P	・Total number of people in basic course : 21,988 (actual data) ・Total number of people in other courses: 6,696 (actual data)	
Input / Activities 1. Construction Equipment Training CETC Project ・1.869 billion (94) / 688million (95) 2. Construction Equipment Training CETC ・The professionals sent for a long term: 11 (96-00) ・The professionals sent for a short term: 23 (96-00) ・The accepted trainees: 21(96-00) ・Provision of the equipment: 148 million (96-00) ・Budget of Sri Lanka : 43 million ・Placement of counterparts: 19 ・Budget: 67,504,362Rs ・Estates and buildings (main office, estate)			・Not a few of the skilled workers were out of the country to work ・The planned power outage resulted from the shortage of water in a dam ・Several terrorisms with bombs by Tamil resisting to the government occurred. ・A shortage of water

IMPROVEMENT OF OPEN UNIVERSITY

1. Program Summary and JICA's Cooperation

Site: Colombo

Photo

(1) Program Background

Sri Lanka Government has proceeded an education policy in which the government offers education at public schools without tuition as the government considers that education is critical as a foundation to develop the nation. Consequently, Sri Lankans education standard is very high comparing other developing countries, achieving high enrolment rate of elementary schools and high literacy rate both of which are over 90 %. However, concerning education at universities which should educate professionals to become a center of national development, there were only eight national universities in Sri Lanka at the time this program was designed. Therefore, among people who passed admissions exam of those universities, just 25 % or less can be enrolled at those universities. To increase opportunities to receive academic education, the government established the Open University of Sri Lanka in 1980 offering higher distance education to Sri Lankans over the age of 18.

Under these circumstances, Sri Lanka Government sought assistance to construct Audio Visual Education Centre ("AVEC" in short), which was a part of the plan to increase the number of students, and technical assistance to produce audio-visual teaching materials from Japan.

(2) Program Objectives and Overall Goal

By establishing AVEC at the Open University, this program aimed to provide efficient audio-visual teaching materials for distance education offered by the Open University and to widely offer the distance education to many people qualitatively and quantitatively improving it.

(3) Program Scope

In this program, facilities were constructed in order to produce AV teaching materials for distance higher education of the Open University. Also technical assistance and technology transfer were made to produce those materials.

(4) Program Component

This program consists of the following two projects.

- Project for Establishment of Audio Visual Education Centre in the Open University of Sri Lanka
  (Grant Assistance ("GA" in short): 774 million yen in fiscal 1991, 446 million yen in fiscal 1992)
- Audio-visual Production
  (Assigning dispatched experts at Ministry of Education & Higher Education and the Open University of Sri Lanka: December, 1993 to December, 1997)

(5) Executing Agency

Ministry of Education & Higher Education and
Open University of Sri Lanka
(the present Ministry of Vocational Training & Higher Education and Open University of Sri Lanka)

(6) Present Status of the Program/Viewpoint for Evaluation

All projects of this program were finished when the Dispatching Experts Project of "Audio-visual Production" was completed in December, 1997. From December, 1999 to January, 2000, Ex Post Monitoring Investigation was carried out in Sri Lanka by utilizing information from local consultants submitting an investigation report in March, 2000. Seeing the results of the Ex Post Monitoring Investigation, ex post evaluation was carried out in accordance with "JICA Program Evaluation Guideline (September, 2001)" in this report.

2. Evaluation Results

(1) Relevance

In Sri Lanka, where only 25 % (yearly base) of qualified people to enter universities can enrol at those universities due to the lack of facilities, the Open University of Sri Lanka was established to widely provide academic education for Sri Lankans with remote

teaching. Most students of the Open University are working, because they were not able to enter other universities when they tried to enrol at those universities. Under these circumstances, the relevance of this program is high because the purpose of this program was to improve the efficiency of distance education offered by the Open University,.

In its Six Year Development Plan (1999-2004), Sri Lanka Government says that it "will improve academic education capable to respond to the needs from the labor market by increasing the variety of university courses and by reforming curriculum". Although higher education at universities is being considered important in terms of the development of professionals because of the growing needs from the nation's drastically changing society and economy, the situation that only some of people who passed admissions exam can enter universities remains. Under these circumstances, even in the present day, the Open University offering distance higher education to working students still maintains its social value. Therefore this program aiming to qualitatively and quantitatively enrich teaching materials also maintains relevance even 10 years after its completion.

(2) Effectiveness

In this report, using data of the number of produced AV materials at the AVEC and the utilization rate of those materials, evaluation was carried out to examine the effectiveness of this program, which purpose is the quantitative and qualitative improvement of distance education by producing AV materials.

2-1) The number of produced AV materials

Although the number had once decreased after 1994 when 211 of materials produced, it has been gradually increasing since 1998, producing 100 to 200 materials in every year. When this program started, the number of audio materials was higher than that of visual materials. However, since 1996, the number of visual materials has been over 50 % of the total number of produced materials in every year. In these years, most produced materials are visual.

However, although the AVEC is capable to produce 400 to 500 of AV materials annually, the actual number of produced materials remains less than the half of the capacity. Some effort has been made to utilize the AVEC such as increasing the number of produced materials for institutions other than the Open University, it can be said that the utilization condition of the AVEC remains low.

<The Number of Produced AV Materials for Each Application>

(Number of audio or visual tapes)

		1993	1994	1995	1996	1997	1998	1999	2000	2001	Total
Audio	Open University	70	17	65	60	20	5	12	1	17	267
	Other Universities	—	—	—	—	—	—	—	—	—	—
	Others	—	120	—	2	3	2	59	8	8	202
	Sub Total	70	137	65	62	23	7	71	9	25	469
Visual	Open University	51	71	30	13	17	23	21	28	17	271
	Other Universities	—	—	—	—	2	1	—	—	—	3
	Others	5	3	7	89	37	83	27	72	143	466
	Sub Total	56	74	37	102	56	107	48	100	160	740
Total		**126**	**211**	**102**	**164**	**79**	**114**	**119**	**109**	**185**	**1,209**

Source) Sri Lanka Programs Evaluation Team (May, 2002)

2-2) The Utilization of Produced AV Materials

The data shown in the following table is the actual utilization rate of produced materials at Colombo Centre which is one of the local centres the Open University has nationwide. The number of rented materials has been decreased after 1998, although the total number of students has increased. In 2001, the number of students per one rented material was 8.1. Even If there is no student who rent same material more than once, this data means only one in 8.1 students has rented AV materials. It should be said that the utilization of the materials very low.

One of the causes of the low number of rented materials should be the low number of available video players to see those materials. Only 18 video players have been provided for some 20 thousand students studying at the nationwide local centres including the Colombo Centre.

<The Number of Rented Material (the data at Colombo Centre)>

(Number of audio or visual tapes)

	1995	1996	1997	1998	1999	2000	2001	Total
Audio	—	—	169	244	190	47	38	688
Visual	94	163	1,993	2,167	1,318	1,135	1,253	8,123
Total	94	163	2,162	2,412	1,508	1,182	1,291	8,811

Source) Sri Lanka Programs Evaluation Team (May, 2002)

< The Number of Student per One Rented Material (the data at Colombo Centre)>

(Number of audio or visual tapes)

	1995	1996	1997	1998	1999	2000	2001
Total number of rented materials	94	163	2,162	2,412	1,508	1,182	1,291
Total number of students at Colombo Centre	—	—	9,848	9,902	9,625	10,136	10,509
Number of students / 1 rented material	—	—	4.5	4.1	6.4	8.5	8.1

Source) Sri Lanka Programs Evaluation Team (May, 2002)

Considering the data above, an objective of this program to produce AV materials was achieved. However it should be said that produced AV materials could not significantly contribute to improve the quality of distance education, and that the contribution of this program to students of the Open University, the final beneficiary of the program, is not so significant.

(3) Efficiency

Both of GA and Dispatch of Experts [1)] were completed as planed without significant changes of TOR, executing agencies and executing expenses.

(4) Impacts

4-1) Improved understanding of AV materials

Unlike the University of the Air in Japan which offers distance education with mainly television and radio, the Open University of Sri Lanka teaches students at their homes using printed materials and books also helping the learning of those students with self-schooling system and interview-type classes at the headquarters or the local centres. Until the AVEC was established, the utilization of AV materials had been very limited. As mentioned in the section of "Effectiveness", the actual number of utilized material is low comparing the number of students. However, it was confirmed by interview with the executing agencies and questionnaires that the AVEC has contributed to improve understanding of the usefulness of AV materials especially among people concerned with higher education at other institutions such as universities through workshops and others held by the AVEC. Furthermore, students of the Open University also understand the effectiveness of AV materials which directly appeal to vision and the sense of hearing unlike conventional printed

[1)] The original TOR of Dispatch of Experts was technical assistance for production of audio-visual materials using equipment provided by GA. However, actual tasks also included promotion activities to utilize materials, and assistance for DTP of printed materials. Because these additional tasks were made to efficiently and effectively produce audio-visual materials, these are not applied to the significant change of TOR.

materials.

4-2) Services for other institutions

The AVEC provides very unique production equipment for AV materials in Sri Lanka in terms of its scale and quality. Since the AVEC is highly valued at home and abroad, as mentioned in the section of "Effectiveness", the AVEC produces AV materials not only for the Open University but also other institutions to use for activities in public and private sectors in Sri Lanka. These materials are also made for JICA's projects (Automobile Machining, Nursing Education, and Quality Improvement of Textile). These facts prove that the AVEC is highly recognized at home and abroad in terms of its production equipment for AV materials and its production techniques. As a result, the AVEC has been won 11 video production awards for the eight years from 1994 to 2001 in many countries including Japan (6 awards), Iran (2), Thailand (1) and Sri Lanka (2).

(5) Sustainability

5-1) Financial aspect

The following table shows the budget for the AVEC granted by Sri Lanka Government. Because the executing agencies did not answer about the budget (current balance) of the AVEC in the questionnaire sent for this evaluation, the data in the following table are cited from the report of the Ex Post Monitoring Investigation conducted in March, 2000. The data in the report does not show the current disbursements but the current revenue. This report says that the AVEC earns 1.5 to 2.2 million rupees annually from contracts with government institutions or private companies to maintain facilities and machines in the situation that the budget granted by the government is not enough. With such effort utilizing unoccupied facilities, the AVEC's facilities and equipment have been well maintained even 10 years passed after its establishment.

< The Budget of the AVEC >

(Rupees)

	1997	1998	1999
Ordinary budget	6,949,000	10,135,000	9,898,000

Source) The report of Ex Post Monitoring Investigation (March, 2000)

<Earnings from Contracts with Outside >

(Rupees)

	1995	1996	1997	1998	1999
Total Earnings	2,626,000	2,606,488	2,653,770	2,983,600	2,357,210
Total Expenses	382,588	642,059	450,541	924,591	860,580
Total Profits (AVEC)	2,243,512	1,964,429	2,203,229	2,059,009	1,496,630

Source) The report of Ex Post Monitoring Investigation (March, 2000)

5-2) Organizational aspect

By the profits from contracts with outside, the AVEC can financially manage to maintain its facilities and equipment increasing some staff members in charge of maintenance. Those maintenance tasks are efficiently carried out in the AVEC. Although only a few stuff members can take charge of repairing equipment, these machines are maintained at least to keep their current conditions. However, some of machines that require expensive parts, which have to be purchased from abroad, remains not repaired

Seeing these conditions, it is considered that the AVEC will maintain its efficient sustainability as it continues financial and organizational efforts even if those are not perfect.

(6) Other achievement

6-1) Grant Assistance

Concerning the GA that has been made, minor technical assistance was made to carry out tasks such as preparing manuals of machines. However, further technical assistance that should be examined in this evaluation was not implemented.

6-2) Dispatch of Experts

In this program, experts were sent to technically support to produce AV materials. Those experts actively made technology transfer not only to the staff of the AVEC but also to the faculties of the Open University who produce AV materials by holding workshops for equipment provided by GA for the AVEC to produce AV materials. Ultimately, they also made technology transfer to other universities in Sri Lanka. And those experts made technical assistance to secure earrings from contracts with outside institutions or companies in order to maintain the financial sustainability of the AVEC.

(7) Conclusion

This conclusion generally refers to financial aspect and operating aspect of this program completed in December, 1997, based on the matters confirmed in this evaluation focusing on the sustainability of the effects of this program, which is the general criterion of Ex Post Evaluation.

7-1) Financial Aspect

In order to maintain the sustainability of the program's effects, it is essential that the AVEC will properly maintain its facilities and equipment. As mentioned in this report,

the AVEC has to earn its maintenance expenses mainly from contracts with outside institution or companies because of the shortage of the government budget. Concerning this aspect, taking advantage of its superiority in its largest scale and highest quality in Sri Lanka, and getting the most out of its potential, AVEC could earn stable profits from AV materials produced for outside institutions, by holding seminars and workshops for the production of those materials, or by accepting trainees

7-2) Operating Aspect

The AVEC was established aiming to improve the quality of distance education offered by the Open University. The AVEC can be effective when students start to utilize AV materials produced by the AVEC improving their learning environment. However, considering the outcomes confirmed in this report, the actual conditions regarding the production of teaching materials and the utilization equipment by students have not reached originally planed standards. Therefore it should be said that original purpose of this program has not been sufficiently achieved.

In conclusion, considering the two aspects mentioned above, it can be said the sustainability of the effects given by this program will be financially maintained. However, it might be difficult to say that it will be maintained in terms of its operation. To improve this situation, not only the AVEC but also the Open University as a whole should be deal with this problem by providing environment for students to utilize AV materials and by further using the AVEC's ability to produce those materials.

3. Lesson Learnt

Technical Assistance to Improve Environment for Distance Education

It is highly valued that dispatched experts made efficient technical assistance to support the production of AV materials. However, if experts were dispatched to the AVEC or the Open University to design AV education plans or to diffuse AV education, and they truly improved the quality of distance education offered by the University utilizing highly effective AV materials instead of conventional printed materials, this program should be more effective. Therefore, concerning GA which is now mainly made to provide facilities and equipment, experts should be also dispatched to improve environment to efficiently utilize and manage those facilities and equipment to maintain those sustainability.

4. Suggestion

Continuous Monitoring

The AVEC's equipment to produce AV materials is very unique in Sri Lanka in terms of its scale and quality. Also the AVEC is making effort to earn profits to fill its maintenance expenses, and is comparatively well maintaining its facilities and equipment. However, it should be said that its facilities and equipment and produced materials are not sufficiently utilized because the actual number of annually produced audio tapes and video tapes has been 100 to 200, comparing the capacity of the AVEC which is capable to produce 400 to 500 of those tapes annually, and because of the low utilization rate of those materials by students. One of the causes is the incapable environment for students to use those materials due to the shortage of video players. To more efficiently utilize facilities, equipment and AV materials for students, a task force should be organized including not only the staff of the AVEC but also the faculties of the local centres and all departments of the Open University to discuss how to deal with it.

5. Annex

[PDMe]

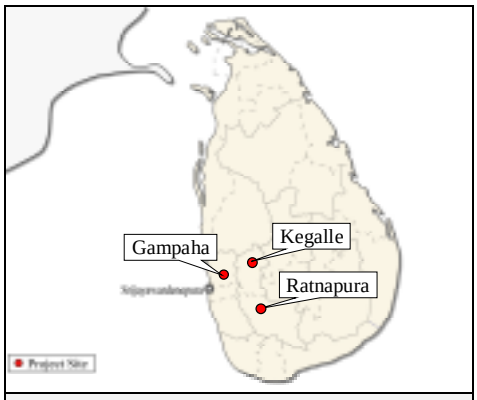
Summary	Indicators and Plan/Performances		External Conditions
	Indicators	**Plan/Performances**	
Overall Goal To more widely offer higher education cultivating professionals	1. the ratio of applicants for universities and the ratio of the applicants who are actually enrolled at the universities 2. the ratio of enrolees to the population over the age of 18. 3. The number of enrolees at each university and the number of students at each university in the nation	・ the ratio of applicants who passed admissions exam and were actually enrolled at universities: less than 25 % (actual data) ・2 % (actual data) ・9 % (actual data) * Both data are shown in the section explaining the background and process of this project. However, which year these data were obtained is not shown. Need to confirm it. ・ The total number of students at nine universities: 30,000 (actual data)	
Program Purpose To increase the number of students who take courses offered by the Open University with distance education	1. The number of enrolees at the Open University and the number of students of the University *2. The number of students who utilize the local centres and the learning centres of the Open University*	・ 50,000 (original data; the target number of 2000) ・ 14,800 (actual data in '90) ・ 19,622 (actual data in '93) ・22,000 (actual data in '95) *No data*	

	3. Career options of graduates	· The number of qualified graduates: 11,499 (actual data from March, '82 to '89 and in '90)	
	4. The ratio of students who dropped out	· 1/3 (it might be over 70 % according to some information source) (actual data)	
Project Purpose 1. Project for Establishment of Audio Visual Education Centre in the Open University of Sri Lanka (Grant Assistance) to provide efficient AV materials qualitatively and quantitatively improving courses at the Open University … General Report ('93)	1-1 The number of produced audio tapes and video tapes	· the number of audio tapes for Sri Lanka Broadcasting Corporation: 150 (actual data) · the number of video tapes for child education: 115 (actual data)	
	1-2 The utilization of produced audio tapes and video tapes	· Most students are not able to use AV materials because of the insufficient utilization system	
	1-3 The utilization rate of AV materials	*No data*	
2. Audio-visual Production (Dispatch of Experts) to improve producing techniques for AV materials	2-1 The technical level of the staff who leaned producing techniques	· Most staff members at the Media House are tackling their given takes. There are a few excellent camerapersons and editors. (actual data) · In high places, there are a few people who are not totally capable of their jobs. (actual data)	
	2-2 The technical level of the faculties of the Open University who leaned producing techniques	· The more than 200 of faculties of the Open University (original data) · More than 100 (actual data)	
Outputs 1. Project for Establishment of Audio Visual Education Centre in the Open University of Sri Lanka	1-1 Audio Visual Education Centre	Total floor area 1,871 ㎡	· Many people do not understand English.
	1-2 Audio visual equipment	Shown in the list (actual data)	· Proper "management and operation system", "budget to maintain facilities and

(Grant Assistance) (Facilities) · Audio Visual Education Centre (including studios): Total 1,871 ㎡ … GA Project Outline List (Equipment) · Equipment to produce AV materials (including studio equipment) · Equipment distributed to the learning centres (13 sets of video players) · Operation manuals for 2 sets of 113 machines (including 3 sets of operation manuals and maintenance manuals) … General Reports in '91 and '92 2. Audio-visual Production (Dispatch of Experts) · Guidance for the production of AV materials was made to all staff members at the Media House and all faculties of the Open University (ultimately to faculties of all universities in Sri Lanka) …Project Implementation Plan by Mr. Tomizaki	*2-1 The quality, frequency of lectures (including workshops and OJT) and the number of participants of those lectures* *2-2 Availability of prepared manuals*	*No data* *No data*	equipment", and "training for the staff" are required.
Input / Activities 1. Project for Establishment of Audio Visual Education Centre in the Open University of Sri Lanka (Grant Assistance) · 574 million yen ('91), 774 million yen ('92) … General Reports in '91 and '92 2. Audio-visual Production (Dispatch of Experts) · Dispatch of experts who secularize in the production of AV materials '93.12.13 to '97.12.12			· Request from the owner concerning the flood of a river flowing by the site

IMPROVEMENT OF JUNIOR SCHOOLS

1. Program Summary and JICA's Cooperation



Program Site

Students at an junior school

(1) Program Background

As Sri Lanka Government considers education as a part of "Human Resources Development" in its national development plan, it has proceeded educational reform since 1997 mainly aiming to expand educational opportunities, to improve the quality of education, to cultivate and re-educate teachers, and to improve administration related to education. However, in ordinal schools, because more than one class have to share a class room, students are difficult to focus on learning, and proper teaching is difficult to carry out. Furthermore, in many class rooms, there are few windows, doors, and plumbing equipment. With these situations of low-quality school facilities, Sri Lanka Government designed the plan of "Improvement of Junior Schools" seeking Grant Assistance from Japan to improve class rooms at nationwide junior schools and junior high schools, to construct additional facilities and to improve teaching materials.

(2) Program Objectives and Overall Goal

This program was implemented to improve educational environment, to offer educational opportunities to many students at some chosen junior schools and junior high schools in Gampaha and Kegalle in Western Province and Ratnapura in Sabaragamuwa Province.

(3) Program Scope

After discussions, Sri Lanka Government and JICA chose 25 of junior schools and junior high schools in Gampaha and Kegalle in Western Province and Ratnapura in Sabaragamuwa Province to construct facilities (plumbing equipment and school

buildings with additional facilities including multi-purpose rooms), and to provide equipment and materials (desks, chairs, teaching materials for Science and others).

(4) Program Component

This program consists of the following projects.

- Improvement of Junior Schools
  (Grant Assistance: 1.02 billion yen in fiscal 1998, 1.329 billion yen in fiscal 1999)

(5) Executing Agency

Ministry of Education & Higher Education
(the present Ministry of School Education)

(6) Present Status of the Program/Viewpoint for Evaluation

This program was completed when the Grant Assistance of "Improvement of Junior Schools" was finished in 1999. This report explains the results of Ex Post Evaluation conducted in accordance with JICA Program Evaluation Guideline (September, 2001).

2. Evaluation Results

(1) Relevance

Considering the following matters, we confirmed the relevance of this program.

1-1) National Development Plan

In the section of "Education" in its "Six Year Development Plan (1999-2004)", Sri Lanka Government says that "the improvement of the quality of education with reformed curriculum and high-quality inputs" shall be implemented. This program has contributed to improve educational environment and expand educational opportunities for students of junior schools and junior high schools by constructing facilities (plumbing equipment and school buildings with additional facilities including multi-purpose class rooms), and providing equipment and materials (desks, chairs, teaching materials for Science and others). Therefore, we assessed this program, which purpose adhered with the national development plan, was relevant.

1-2) Education Development Plan

In its currently implementing "Six Year Educational Development Plan (2002-2007)", Sri Lanka Government says that "the increase of school enrolment rate at junior

schools and junior high schools, especially at those in local areas" shall be required as it said at the time in 1998 and 1999 when this program was implemented. Therefore we say that this program, which supported to improve facilities for local junior schools and junior high schools, adhered with this Educational Development Plan, and still remains relevant.

1-3) General Educational Reform

Sri Lanka Government is currently proceeding educational reform in accordance with its "General Educational Reform", which has been in effect since 1997. In the General Educational Reform, the government says that "it shall provide class rooms at each junior schools and junior high schools for extracurricular activities by which students can learn skills and techniques using tools". And it also says "Science shall be one of important subjects". Therefore we say that this program, which supported to provide multi-purpose rooms and teaching materials for Science at junior schools and junior high schools, adhered with this General Educational Reform, and is relevant.

(2) Effectiveness

To evaluate the effectiveness of this program, we chose the following two indicators. First one is a qualitative indicator; the environment of school buildings constructed in this program. Second one is a quantitative indicator; how the improved educational environment contributes to decrease the ratio of dropped-out students. We chose these indicators because officials in the Ministry of Education, principals and teachers in schools consider that there is a certain relation between the improvement of school facilities and the ratio of dropped-out students.

2-1) Environment in class rooms

The schools we visited both have new buildings constructed in this program and old buildings many of which are still used. The bright class rooms with large windows in these new building can sufficiently accommodate some 40 students of a class. And wooden lockers for students are installed in the back of those rooms. Students can store unnecessary goods in these lockers. In these class rooms, the quality of learning environment maintains very high.

On the other hand, class rooms in old school buildings also accommodate same number of students of a class as those in the new buildings. However at some schools, a one-storied building is divided with partitions which are slightly lower than students to make temporary class rooms. In these instant rooms, students are annoyed with voices of teachers and students from other rooms with difficulty to concentrate to learn. And these dark rooms with small windows are very small and do not provide

lockers same as those in new buildings. For students, it is hardly to say these rooms provide good learning environment.

2-2) The ratio of dropped-out students

We showed the ratios of dropped-out students at 20 schools out of the 25 schools mentioned above in the following table, because we have not received the answers of the questionnaire sent to 5 schools. We can not say that the decrease of the ratio of dropped-out students resulted from only the improved educational environment, because family matters also affect students who have to leave schools. However, the average ratio from 1999 to 2001when new buildings were completed decreased at 11 out of the 20 schools (4 schools showing no data, 1with no change, and 3 increased) comparing the average ratio from 1996 to 1998. Especially at Maduwanwata Sri Sarananda Junior School and Panawanna South School which ratios of dropped-out students had been high, the ratios significantly decreased.

< The ratio of dropped-out students (20 out of 25 schools)>

(%)

School Name	1996	1997	1998	1999	2000	2001
Welippillawa Junior School	2.2	2.0	2.8	3.6	4.0	3.0
Hekittha Christ King School	1.8	1.6	1.5	1.3	1.4	0.6
Daluwakotuwa St. Anne's School	0.6	0.4	0.3	0.1	0.1	0.1
Bamunugama Maliyadewa Junior School	0.2	0.2	0.2	—	0.1	—
Ussapitaya Sri Sumangala Junior School	—	0.3	—	0.3	—	—
Dedugala Junior School	0.4	0.4	0.3	0.2	0.1	0.1
Amithirigala Junior School	2.6	3.6	5.8	5.9	3.9	0.9
Halmillakatiya Junior School	—	—	0.2	1.2	—	—
Maddumandara Junior School	4.2	4.1	4.2	3.7	3.8	3.8
Hettimulla New Junior School	—	—	—	—	—	—
Ashoka Junior School	2.5	2.2	2.2	2.0	1.5	1.0
Baddewela Junior School	0.2	—	—	—	—	—
Dehiowita Buddhist Junior School	—	—	0.5	0.2	—	—
Godewala School	4.8	2.9	3.3	3.2	1.8	2.3
Maduwanwala Sri Sarananda Junior School	18.0	16.1	10.1	6.1	5.1	3.5
Rahura Junior School	—	—	—	—	—	—
Gappaya School	7.5	2.8	5.6	3.0	2.1	2.3
Ranwala School	—	—	—	—	—	—
Dhamahana School	—	—	0.2	0.2	0.4	—
Panawenna South School	20.0	18.0	15.0	15.0	7.0	6.0

Source) Sri Lanka Programs Evaluation Team (May, 2002)
Note) Among the 25 schools, 5 schools (Dedigama Junior School, Kadireshan Tamil School, Pothdenikanda Junior School, Hidellana Junior School and Wewdagala School) have not returned the questionnaires we sent. Therefore the data of those 5 schools are not included in this table.

(3) Efficiency

This program was completed in accordance with the original plan without special changes in the scope of the program, executed period and project cost.

(4) Impacts

4-1) New relationship between communities and schools

In Sri Lanka, parents are keenly concerned with their children's education. However, before new school buildings are completed, the number of applicants for enrolment at schools was not so high comparing the school capacity. After the completion of new buildings, children twice or three times more than the capacity apply for enrolment although the increasing rates are different for each school. And also mentioned in the section of "Effectiveness", the ratio of dropped-out students has decreased since the new buildings are constructed. The improved environment also influences teachers to work longer period than before. And according a report, there are many teachers at other schools who want to change to the schools with the new buildings.

Furthermore, at many of the schools, students and parents voluntarily clean their schools every day or twice or three times in a week. At some schools, to improve school security for students, parents planed to make fences surrounding the schools with donation.

Considering these situations, the new buildings remind parents that educational environment is important trying to maintain and improve the environment by their community. It can be said that this program strengthened the relationship between communities and schools.

4-2) Influence on communities

Among the schools we visited, there was a school near sea, 60 % of which students' parents are fishermen. Because, in many fishermen's houses, there are not toilets, they are used to relieve their selves outside. However, since the new buildings with clean toilets are constructed, those fishermen's household learned the advantage of clean toilets from their children. Even some households began to provide their own toilets in their houses. Although it was not expected, we considered this is one of good impacts brought by this program.

(5) Sustainability

5-1) Systematic aspect

Each school is operated under a principal carrying out various own programs to improve school operation including activities for on-time arriving at school, school cleaning, library improvement, morning assembly in English, leadership improvement, English skill improvement, and providing school vegetable gardens. Generally, Schools are actively making effort to improve their own environment.

Furthermore, the Ministry of School Education holds seminars for the principals of the 25 schools at Colombo to exchange their opinions concerning the improvement of school environment. Teachers and students also visit other of the 25 schools each other to promote interaction and to exchange their opinions. These kinds of information exchange are expected to contribute to improve the environment of each school.

5-2) Actual condition of facilities

As we mentioned in the section of "Effects/Impacts", students and their parents voluntarily clean their schools periodically maintaining the good conditions of the schools. However, at some schools in areas where many wild pigeons inhabit, pigeons often make their nests between beams and ceilings in school buildings littering their droppings on class rooms. For sanitary reasons, in these class rooms, fish nets are placed to avoid the droppings from falling. And there is a school on which first floor, the surface of mortar floor outside of a class room remains removed. Either of the conditions mentioned above do not interfere daily operation. However, such conditions which can not treated by daily cleaning remains not repaired.

5-3) Financial aspect

Because we could not obtain data concerning budget to maintain facilities, there is a limitation to evaluate the financial aspect of the schools in this report. According to the Completion Evaluation conducted in June, 2001, the provincial governments bear the cost of large constructions such as installing fences. Meanwhile, the communities carry out daily repair and maintenance. Repair and maintenance are usually performed according to principals' discretion and depending on the economic conditions of the communities. Therefore the degree of repair and maintenance is different for each school. Considering these situations, it can not be said all of the schools have financial problems.

(6) Other achievement

This program consists of two Grant Assistances. Although miner technical assistance was made to prepare manuals for equipment, other technical assistance which we should evaluate was not implemented.

(7) Conclusion

In this conclusion, we focused on "the sustainability of effects", which is a criterion of general assessment for Ex Post Evaluation, based on the matters confirmed in this report.

The purpose of this program was to quantitatively and qualitatively improve primary and secondary education by providing plumbing equipment and facilities with multi-purpose rooms at schools. Comparing the old buildings, students became able to concentrate to learn in the new larger class rooms which are completely divided by walls. As learning environment is improved, the sanitary environment for students is also improved by providing plumbing equipment and toilets. The improved environment contributed to increase the number of students and to decrease the ratio of dropped-out students. Considering these situations, we assessed that the purpose of this program was achieved.

Furthermore, the improvement of school facilities also influenced communities. The consciousness of parents raised to improve and maintain school environment establishing new relationship with schools.

3. Lesson Learnt

Although this program was implemented to improve educational environment by providing school facilities, it was also effective to strengthen the relationship between communities and schools. It can be considered that the improvement of school facilities influenced people in community to understand the importance of education. At this time, although parents have a keen interest in their children's education, communities did not participate in the planning of this program. However, if we will plan similar programs, we should hear the opinions of communities to reflect those on the detail of program (design and maintenance of facilities) from the beginning of the planning.

4. Suggestion

In the field studies we made, there are many facilities, on which first floor, the surface of mortar floor outside of class rooms remains removed. At the time of the studies, this did not interfere with daily operation. However, because repair of the floors can not carried out by students or communities, periodic inspection should be implemented on facilities and necessary budget should be ensured.

5. Annex

[PDMe]

Summary	Indicators and Plan /Performances		External Conditions
	Indicators	**Plan/Performances**	
Overall Goal To Expand educational opportunities, to improve the quality of education, to cultivate and re-educate teachers, to promote educational reform mainly aiming to improve educational administration (as a part of "Human Resources Development" planned by the government) ... Project Outline List	*1. Enrolment rate* *2. Literacy rate* *3. Ratio of students entering junior high schools from junior schools* *4. Ratio of students dropped out junior schools and junior high schools* *5. Conditions of facilities at junior schools and junior high schools in Sri Lanka* *6. Number of students a teacher takes charge of*	*No data* *No data* *No data* *No data* *No data* *No data*	
Program Objective *To provide opportunities to take primary and secondary education to people in Gampaha, Kegalle and Ratnapura, and to improve learning environment and the quality teaching in the three areas*	*1. Enrolment rates in the three areas* *2. Literacy rates in the three areas* *3. Ratios of students entering junior high schools from junior schools in the three areas* *4. Ratios of students dropped out junior schools and junior high schools in the three areas*	*No data* *No data* *No data* *No data*	

	5. Conditions of facilities at junior schools and junior high schools in the three areas	*No data*	
	6. Number of students a teacher takes charge of in the three areas	*No data*	
Project Objective 1. Improvement of Junior Schools (Grant Assistance) to provide educational opportunities at the schools implemented this project *To improve learning environment and the quality of teaching* 2.JOCV (Mr. Ashizawa: teacher of Science) 3.JOCV (Mr. Nishimura: teacher of Science)	*1-1. Numbers of students and teachers at each school*	*No data*	
	1-2. Average number of students accommodated in a class room	*No data*	
	1-3. Ratio of dropped-out students at each school	*No data*	
	1-4. Satisfaction of students and teachers	*No data*	
	1-5. Openness of facilities to communities	*No data*	
	1-6. Operating rate of equipment	*No data*	
Output 1. Improvement of Junior Schools (Grant Assistance) (Facilities) ･12 School buildings; total floor area 11,214.4㎡ ('98) ･13 School buildings; total floor area 13,516.6㎡ ('99) ... Completion Report (Equipment) ･ Equipment for junior high schools (Furniture, other equipment and teaching materials for Science)	1-1. School buildings at junior schools and junior high schools	･ 11,214.4㎡ (12 schools in '98) / 13,516.6㎡ (13 schools in '99) (actual data)	･ Proper operation and management system, budget to maintain facilities and equipment, and training for teachers are required.
	1-2. Teaching materials and equipment	･ Shown in the list (actual data)	
	1-3. Training of teachers to use equipment	･ 00.3.7-8: 34 participants ･ 01.1.17-19: 44 participants (actual data)	
	1-4. Number of teachers capable to use equipment	*No data*	

・ Operation manuals for equipment (English); 13 sets ('98) / 66 sets ('99) ... Appendix 4 of Completion Report ・ Guidance for operation (training for equipment and teaching materials for Science conducted 2000/3/7-8: 34 participants; training for teaching materials for Science conducted 2001/1/17-19: 44 participants ... Detailed Data in Completion Report 2.JOCV (Mr. Ashizawa: teacher of Science) 3.JOCV (Mr. Nishimura teacher of Science)			
<u>Input</u> 1. Improvement of Junior Schools (Grant Assistance) ・1.329 billion yen ('98) , 1.012 billion yen ('99) 2.JOCV (Mr. Ashizawa: teacher of Science) 3.JOCV (Mr. Nishimura: teacher of Science)			・Locations of toilets were moved for religious reasons.

Improving Health/Medical Services

FACULTY OF DENTAL SCIENCES - UNIVERSITY OF PERADENIYA

1. Program Summary and JICA's Cooperation

Program site

Surgery at Dental Hospital Peradeniya

(1) Program Background

The prevalence of dental caries (tooth decay) is considerably high in Sri Lanka. Although 80% of the adult population (twice as much as that in developed countries) requires dental treatment, the access to dental care service is extremely limited, posing a serious problem hindering the maintenance of the people's health. The government of Sri Lanka, therefore, recognizes the urgent need for improving the prevention and treatment of dental diseases and envisions implementing a national program in this field. However, the Faculty of Dental Science in University of Peradeniya (hereinafter, referred to as the Faculty), which is the only institution for the training of dentists in Sri Lanka, has a problem of the superannuating and shortage of educational facilities and equipment. The school has difficulties in providing general education in dentistry and responding to the need for dentists in the country.

In this situation, the government of Sri Lanka requested a grant assistance concerning the funds needed for the construction of the facilities and the procurement of equipment, as well as the technical assistance concerning the training in the use of the equipment to be installed in these facilities and the training of dentists and dental specialists.

(2) Program Objectives and Overall Goal

This program is being implemented in order to cultivate dentists with the knowledge of modern dentistry in the Faculty, and in order to contribute to the prevention and treatments of various dental diseases in Sri Lanka.

(3) Program Scope

By the grant assistance, facilities (one for basic education, one for clinic training including treatments for outpatients, and one for a dining hall) were constructed in University of Peradeniya in Kandy District (hereinafter, referred to as the University). Also equipment used for teaching was provided (including dental chairs, desk-top sterilizers, dental tools and microscopes) in those facilities. Currently, in the project-type technical assistance, the following tasks are being implemented.

- Guidance for education and training concerning dental education (for 7 courses and 17 departments)
- Training for the improvement of technical staff
- Training for the improvement of nursing staff
- Training for clerical personnel to efficiently operate the Faculty
- Postgraduate education for dentists and dental specialists.

(4) Program Component

This program consists of the following projects.

- Project for Improvement of the Faculty of Dental Sciences, University of Peradeniya
  (Grant assistance, 114 million yen in fiscal 1995, 2.245 billion yen from fiscal 1996 to 1997)
- Project for Dental Education at the University of Peradeniyha
  （Project-type technical assistance implemented from February, 1998 to January, 2003）

(5) Executing Agency

- The Faculty of Dental Sciences, University of Peradeniya
- Ministry of Education & Higher Education (MoE&HE in short)
- Ministry of Health & Indeginious Medicine (MoH&IM in short)

(6) Present Status of the Program/Viewpoint for Evaluation

In this program, the grant assistance, Project for Improvement of the Faculty of Dental Sciences, University of Peradeniya was completed in March, 1998. And in February of the same year, the project-type technical assistance was started. At the time of this survey, this technical assistance is being implemented also aiming to maintain its sustainability after its completion in January, 2003.

2. Evaluation Results

(1) Relevance

This program was planed to contribute to the improvement of Sri Lankan dental health by enhancing dental education, services and researches at the Faculty and the Dental Hospital Peradeniya (hereinafter, referred to as the Hospital).

In its national development plan, Sri Lanka Government set the following goals concerning social development; 1) achievement of equal health services, 2) reinforcement of Primary Health Care (PHC) and 3) qualitative and quantitative development of human resources in the health and medical fields. Therefore, this program carrying out the capacity building of human resources by improving the quality of education adheres to this Sri Lankan policy in a broad sense.

In Sri Lanka, 80 % of the adult population (twice as many as those in developed countries) need treatments for dental caries. And currently, the primary cause of death for people who died of malignancy is oral cancer, by which 12 % of the people died. Considering these circumstances, the project purpose, "to provide the highest-quality functions to the Faculty and the Hospital under limited conditions ", well responded to the needs from Sri Lankans.

Furthermore, the improvement of dental education is also required in order to develop human resources in the health field for the prevention of Sri Lankan dental diseases. Dental diseases would decrease in future by developing human resources in the dental health field including dentists, dental assistants and dental mechanics. In terms of dental education, the University is the only institution to cultivate dentists in Sri Lanka offering 4-year education. The University also educates dental assistants and other dental specialists.

(2) Effectiveness

We can say that the program purpose was highly achieved with excellent effectiveness. Especially, the ability and techniques of dental instructors have been greatly improved. Furthermore, the Faculty and the Hospital now can offer training courses for many graduates and other specialists in the nation with the ability and techniques acquired in this program. With this fact, we considered that the educational ability of those institutions has been reinforced by this program.

Especially improved medical services are surgery for cleft lip and cleft palate, microvascular suture, distraction osteogenesis, craniofacial plastic surgery, and surgery for jaw deformity. Now the counterparts have acquired sufficient techniques for those surgeries, and are able to

carry out those by themselves. Moreover, as a result of this program, trainings for patients to restore oral functions have been continuously implemented using implant technique.
Concerning research activities, the University participated in only 10 conferences in the fields of prosthodontics and pedodontics in 1997. However, in 2000, the number of conferences it attended increased to 44 across seven fields. In 1997, only two papers on prosthodontics and public health dentistry were published in domestic journals. In the same year, no paper was published in international journals. However, in 2001, nine papers were published in domestic journals in various fields. And in international journals, 11 papers were published in the fields of oral diagnosis, pharmacology, oral pathology, oral surgery, and public health dentistry. The quality of research has met with the international standard.

Concerning the education system, the Faculty introduced new module-style curricula including basic medical science in the academic year of 1998 (from September, 1998 to June, 1999), when this project was started. We have to emphasis that the University is one of a few public dental universities in South East Asia which provide the department of basic medical science. Obviously, these curricula have become more effective with the instructors' knowledge and techniques acquired in this program, and with the equipment provided by the grant assistance and technical assistance. In future, this program would contribute to the improvement of oral health services in Sri Lanka.

Furthermore, there is a change in the number of patients we must not overlook to see how services have been improved. In 1997, the number of patients was 32,066. In 2001, it sharply increased to 109,546. Moreover, the number of reports on histopathology in 1997 was only 909. In 2001, it increased to 2,321, which is a remarkable figure to prove the quality of researchers in oral pathology.

After the trainings in this program, the advanced dental testing technology has contributed to the improvement of dental techniques. Drastic improvements were observed in the fields of dental porcelain, bridgework, artificial tooth with partial metal base, prosthetic appliance for jaw, and hybrid ceramics.

To improve the basic ability of nurses and dental assistants, five guidelines (sorting, cleaning, organizing, cleanliness and discipline) were introduced to the Hospital by this project. Since this introduction was made, the Hospital has been cleaned and organized. Regarding techniques, four-hand system for dental treatments was introduced to five departments. As the result, the technique became a routine especially in the department of pedodontics. Also it is remarkable that nurses are carrying out guidance on public oral health.

Concerning the maintenance of the facilities equipment of the Faculty and the Hospital, the number of maintenance staff members has been sufficiently increased. Considering the results of interviews and presentations in the workshop for evaluation, maintenance techniques used

for these facilities and equipment are suitable. However, because each department currently takes charge of the maintenance of its equipment and spare parts, a central management system has to be established as soon as possible.

As mentioned above, this project achieved excellent outcomes. Meanwhile, there are the following disincentives for the efficient management of the Hospital; the shortage of dental assistants and anesthesiologists, and the relationship with the MoE&HE and the MoH&IM as the decision makers. Especially in terms of the allocation of budget and the management of the Hospital, negative relationship between the two ministries has become a large deterrent. Therefore, "Board of Management", which is prepared to be introduced, must be organized immediately.

(3) Efficiency

Each training plan was designed with modified PCM Method adhering to the concept of this project. This method was used to concretely plan tasks for each expert to achieve a high degree of efficiency. These trainings were implemented as planed. And the efficiency of this project was generally satisfying.

The objectives of the training plans were precisely determined with information exchange between experts and their counterparts.

Especially in the department of oral pathology, high efficiency was achieved. In a limited time, the purposes of the training plans were accomplished with sufficient outcomes commensurate with the amount of inputs.

Because oral cancer is a high priority to tackle in this project, suitable inputs to the department of oral surgery was intently implemented to improve treatments for the disease in the early stage of this project. However, the total amount of inputs for the improvement of oral health services was very large. We have to say that these inputs for oral health and other inputs and activities for other fields were not balanced. Although this project sufficiently achieved its purpose, some management problems, which were pointed out in the interim evaluation as well as in this study, have not been solved.

(4) Impacts

Since this project was started, some important effects were observed concerning dental education, services and research activities contributing to the improvement of Sri Lankans oral health.

As the importance of controlling oral cancer has been widely understood by this project, the national cancer control program and this project started a joint research especially focusing on jaw reconstruction.
The Faculty and the Hospital have been widely recognized in neighbouring counties in terms of their high-quality medical services. The dispatched experts in a long term held seminars in Myanmar, Cambodia, Nepal and Bangladesh as well as in Sri Lanka conducting a needs assessment to establish a center for human resources development in South East Asia. They are currently planning to hold a workshop at the Faculty for neighbouring counties within this fiscal year. It is obvious that the Faculty and the Hospital would play an important rule to improve the quality of dentistry though dental education they offer in near future.

Third country trainings are planed to start for postgraduate foreigners, when Sri Lanka Government becomes able to bear a part of the cost. As educational globalization proceeds, developed countries such as the U.K. or the U.S. are actively accepting international students. However, for Japan, it is difficult because of its education system (medical practice can be carried out only by doctors who are educated and qualified in Japan) and the problem of language. Therefore, various activities are carried out to establish a dental education center for neighbouring countries at the Faculty.

As other institutions recognize that the Faculty is conducting the international-level research activities, some joint researches were started independently of this project. For example, the Faculty and Tsurumi University recently concluded the "Agreement of Academic Cooperation and Exchanges between the University of Peradeniya and Tsurumi University". The Faculty carries out scientific exchange also with Tokyo Medical and Dental University. Such collaboration would develop good relationship with other research institutions making more active information exchange regarding oral health.

Concerning gender gap problems, this program was not planned and implemented in consideration of these problems. However, according to the interviews with the dispatched experts, there is no gender gap regarding technical guidance.

This program did not directly cause any negative impact on the environment. Medical waste and waste water are properly discarded.

(5) Sustainability

In general, most staff members have settled in their job. Since this project was started, any brain drain has not happened. Currently, the quality of techniques and technologies achieved in this project has been maintained. However, the management ability must be reinforced in future.

Concerning technologies, most those learned in this project became a foundation for counterparts in order to improve their technologies and techniques. Joint researches conducted by the Faculty and other research institutions in Japan or neighbouring countries are remarkable attempts for the Faculty to continuously implement their international-level research activities and educational activities. Also those researches are a means of expanding the outcomes of this project to maintain technologies, financial condition, research and education.

As for the financial sustainability, the counterparts answered in the interviews that the MoH&IM has approved partially chargeable medical services, and is currently designing a concrete plan. The target of this plan is that earnings from the services will cover 40 % of the overall operation costs within 10 years. Although some plans are available to financially support the Hospital by the MoE&HE and the MoH&IM until the Hospital becomes independent financially, the prospect of the Hospital regarding its financial sustainability is still uncertain. In this fiscal year, the MoE&HE plans to reduce the overall budget for the University. It might hinder the Hospital's medical services. Various measures should be taken to increase revenue in order to ensure the sustainability.

Meanwhile, according to a report of the dispatched experts, they predict that the number of failures of machines provided in this program would be 1800 in 2008, after 10 years of the provision, if all of those machines will have been in operation. This number almost equals to the number of machines provided by the grant assistance and the technical assistance. Therefore a budget has to be ensured to deal with these failures.

The Faculty and the Hospital are concerned with the two fields of education and health in Sri Lanka. Now, the MoE&HE and the MoH&IM both commit these institutions management and operation making problems more complicated. Therefore the currently-planning Board of Management would be a key for the Faculty and the Hospital to achieve their sustainability for finance and management.

The sharp increase of patients might threaten the quality of medical services and education, and the financial condition of the Hospital. To ensure the quality of medical services and education, the Hospital and the MoH&IM have to cooperate to establish a practical referral system.

(6) Other achievement

Transferred technologies have been steadily utilized achieving excellent outcomes. The counterparts are now able to further develop those technologies by their own. Needless to say, awareness of educational staff, medical staff and even clerks has to be raised to energize their activities of education, research and medical services.

(7) Conclusion

In conclusion, activities organized with PDM have been properly implemented to achieve the project purpose, which aims to provide the highest quality functions to the Faculty and the Hospital under limited conditions. Some departments achieved remarkable outcomes. We also confirmed that necessary activities will be continuously carried out adhering to the PDM until this project is completed.

By efficiently implemented technical trainings, the counterparts improved their ability to research by themselves in order to develop their technologies. To maintain the positive effects of this project after its completion, the Faculty and the Hospital must develop their own technologies.

Moreover, whether the Board of Management for the Faculty and the Hospital is established is a key to ensure the sustainability of this project concerning finance and management.

3. Lesson Learnt

The former program leader had designed this program coordinating the grant assistance and the technical assistance since the time of the advance survey for the grant assistance. His consist plans for facilities, equipment and the details of technical assistance have contributed to the achievement of this program. Furthermore, because the Faculty and each department implemented their own plan with PCM, the staff members of the University have actively participated to those plans adjusting the details of inputs, and their timings. The efficiency of this program was improved by those staff members.

The participatory approach was introduced to design this program appointing the core staff members headed by the dean of the Faculty. Because those staff members actively cooperate to proceed this program, the ownership of the counterparts has been developed.

The timing of the project-type technical assistance was very effective because the operation of the facilities constructed in the grant assistance had been unstable during two to three years from their commencement. Therefore such program-type assistance with well coordinated components would be effective in future.

4. Suggestion

The sharp increase of patients is a burden for maintaining the quality of education and services, and financial conditions of the Hospital. The cause of the increase is that many patients directly go to the tertiary hospital with efficient equipment because equipment of other hospitals is usually old or insufficient. The technical assistance team is conducting the "Survey of Dental Clinics in the Central Province" on 16 hospitals in neighbouring areas aiming to normalize the referral system. However, to solve this problem, Sri Lankan resources should be properly allocated.

The management and operation of the Hospital are often interfered by the MoE&HE and the MoH&IM, because they deeply commit the Hospital's personnel affairs and budget. To solve this problem, further effort should be made to establish the Board of Management.

5. Annex

【PDM_E】

Summary	Indicator	Performance	External condition
Overall Goal To improve preventive medicine and medical treatment for general oral diseases in Sri Lanka	Number of Sri Lankan graduates with MS/MPhil	5%(1997) →1%(2001) *Number of dentists：387(1997) →637(2000)*	Ethnic conflict
	Number of graduates of the Faculty who can perform 4 hands dentistry	*No data*	
	Number of seminars for graduates	*1 (1997) → 1 (2002)*	
	Number of areas educated by the Faculty		
	Improvement of employment pattern of oral surgeons		
Program Objective *To cultivate dentists to acquire knowledge of modern dentistry*	*Number of cultivated dentists*	*100 / year (target) →75 / year*	No particular condition
Project Objective 1. (with equipment provided by the grant assistance) To improve the quality of dental education and medical services in the Faculty 2. (by the project-type technical assistance) To improve medical services offered by graduates	*1 Necessary equipment* *2 Rate of students who passed the national examination*	*1 The equipment shown in the left was provided.* *2 1998: 69% 2001: 70%*	No particular condition
Output 1. Facilities constructed for the Faculty (Grant assistance) 2. Improvement of dental instructors' ability 3. Improvement of dental	1. Facilities constructed for the Faculty 2-1 Number of patients of the Hospital 2-2 Total number of biopsies	1. The equipment and facilities were provided. 2-1 72000 (1998) → 120000 (2001) 2-2 1077 (1998) → 2520	The counterparts transferred technologies have settled in their job.

mechanics' ability 4. Improvement of nursing staff's ability 5. Improvement of management ability of the Faulty	2-3 Number of papers published by the staff 2-4 Number of text books and manuals written by the staff of the Faculty 3. Technologies of each department 4-1 Rate of occurrence of in-hospital infections 4-2 Records of four-hand dentistry and performances of the departments of pedodontics, oral surgery and prosthodontics (1998) 5-1 Bacterial contamination rate of microscopes 5-2 Rate of failures of handpiece heads 5-3 Working attitude of the staff including punctuality and rate of presence 5-4 Continuous management for record of maintenance conducted in all fields	(2001) 2-3 1(1998) →6 (2001) 2-4 1(1997) → 3 (2001) 3. 4-1 No data 4-2 No data 5-1 No data 5-2 10 (1998) →14 (2001) 5-3 No data 5-4 Now preparing	
Input 1. Project for Improvement of the Faculty of Dental Sciences, University of Peradeniya (Grant assistance) 2. Project for Dental Education at the University of Peradeniyha （Project-type technical assistance）	Outline 1 2.245 billion yen 2	1. Provision of equipment and facilities 2.1 Dispatch of experts in a long term 2.2 Dispatch of experts in a short term 2.3 Receiving of trainees 2.4 Provision of materials and equipment	1 The equipment and materials passed the Custom without problems. 2,3 Ethnic conflicts

* When this evaluation was conducted, the project-type technical assistance is ongoing. Therefore for accurate results of this program, other evaluation will be made after the technical assistance is completed.

MEDICAL RESEARCH INSTITUTE

1. Program Summary and JICA's Cooperation

Program site

Photo

(1) Program Background

Medical Research Institute (MRI in short), one of the executing agencies of this program, is like a combined institute of National Institute of Infectious Diseases, National Institute of Health Sciences and National Institute of Public Health in Japan. MRI carries out critical missions in Sri Lankan health care system as a research center for fundamental medical science and as a reference laboratory for medical institutions throughout the country. However, MRI had only superannuated facilities and equipment and its capacity had been very insufficient. In June, 1980, to improve the capacity of MRI, Sri Lanka Government sought a grant assistance from Japan to construct facilities (and to expand some existing facilities) and to provide equipment and materials used in those facilities. As the result of an examination by Japanese Government for the possibility of this grant assistance, it recommended that a technical assistance was also required to improve the technical level of MRI. In February, 1987, a joint team for advanced surveys for the technical assistance and the grant assistance was dispatched. After discussions between the team and Sri Lanka Government, they concluded that the technical assistance had to be implemented along with the grant assistance. In March, 1987, an official request for the technical assistance was issued by Sri Lanka Government.

(2) Program Objectives and Overall Goal

This program was implemented to reinforce the capacity of MRI to deal with infectious diseases in Sri Lanka (by improving the ability concerning diagnoses, education, assays, biologics and basic researches).

(3) Program Scope

In August, 1988, Sri Lanka Government and Japanese contingent agreed the following matters as the scope of this program in the Temporary Support Implementing Plan（TSI）.

① Improvement of diagnostic ability
② Improvement of educational ability
③ Improvement of the ability to carry out assays
④ Improvement of the ability to produce biologics
⑤ Improvement of the ability to conduct basic researches

Adhering to the program scope mentioned above, the extended technical assistance was carried out focusing on the following researches with epidemiological priorities in Sri Lanka, which were confirmed by the result of an evaluation conducted in July, 1993.

a. Research on pediatric respiratory infectious diseases and pediatric diarrhea
b. Research on blood fat
c. Research on antivenin

(4) Program Component

This program consists of the following projects.

- Medical Research Institute Project (Project-type technical assistance, implemented from January, 1989 to December, 1993)
- Extension of the project above (Project-type technical assistance, implemented from January, 1994 to December, 1995)

* MRI Construction Project was implemented by the grant assistance (1.04 billion yen in '87, 1.84 billion yen in '88), and competed in April, 1994. Dispatching a joint survey team, both projects above were designed and coordinated with close communications.

(5) Executing Agency

・ Ministry of Health & Indeginious Medicine (MoH&IM in short)
・ Medical Research Institute

(6) Present Status of the Program/Viewpoint for Evaluation

In this program, using facilities completed in fiscal 1988 by the grant assistance, the technical assistance started aiming to provide fundamental technologies for general medical research activities in January, 1989. Based on the evaluation results by the survey team dispatched in July, 1993, the period of the assistance was extended for two years to support the important

researches on blood fat, respiratory infectious diseases, diarrhea and antivenin. The extended assistance was completed on December 31, 1995. In November, 1995, a Completion Evaluation was conducted submitting a report. This time, we examined the results of this Completion Evaluation based on the five items for evaluation focusing on the impacts and sustainability of this program.

2. Evaluation Results

(1) Relevance

The Public Investment Plan of Sri Lanka Government (1987 - 1991) gave a high priority to improve MRI as the only national medical research institution in Sri Lanka. The Sri Lankan health care policy had been proceeded focusing on primary health care requiring medical tests as critical means. This program was implemented to support MRI as the final responsible institution for those tests. Therefore, the purpose of this program adhered to this national development policy.

In Sri Lanka, people often have to suffer intestinal infectious diseases, tuberculosis, parasitosis, undernutrition, anaemia and physical traumas. To support scientific administration of the Government, and to function as a reference laboratory for medical testing institutions throughout the nation, MRI was required to improve its capacity for medical tests and researches by renewing facilities and equipment and by introducing new technologies.

(2) Effectiveness

MRI improved its facilities and personnel to carry out various tasks concerning routine tests, assays, production, researches and education with new facilities and major equipment including an electron microscope, a high-speed centrifuge and an ultra low-temperature bath provided in the grant assistance and with dispatched experts and trainees accepted by Japanese Government in the technical assistance. MRI has been recognized as the only integrated institution for medical researches, tests and education with modern facilities in Sri Lanka. By this fact, we considered that the program purpose was achieved.

Especially, we confirmed effectiveness of transferred technologies and provided facilities by significantly improved MRI's capacity for diagnoses, education and the capacity as a reference laboratory. Therefore, MRI would sufficiently function as a disease diagnosis center and a technical education center in Sri Lanka

Furthermore, it was confirmed the great advancement of the department of virology, the department of bacteriology and the department of medical botany concerning their ability for assays and researches.

Meanwhile, the capacity of the department of biologics has not been so improved because of its limitation. However, necessary technologies for production and fundamental researches have been transferred. These technologies would prove their worth after their continuously uses in a long term. We expect the future of MRI.

(3) Efficiency

Although there were some miner changes in the project such as the delay of dispatching the team leader, most parts of the project including dispatch of experts and receiving of trainees were implemented as planed to ensure the efficiency of the project.

By the grant assistance, main equipment was installed coordinating a plan for the research activities of the technical assistance. Complementary equipment, testing instruments and reagents were mainly provided by the technical assistance.

The hall and seminar rooms have been often used. And although almost 10 years passed after the provision of the equipment, the equipment has been well repaired and maintained by skilful full-time staff in the department of equipment maintenance. Consequently there are only a few machines remained unoperated due to the difficulty of repairs.

(4) Impacts

The quality of MRI's tasks has been significantly improved. Worthy of special notes to prove the improvement are the appointment as a reference center in West South Asia for polio virus by WHO, the launch of production of specific pathogene free (SPF) experimental animals at the Animal Center, and the holding of a seminar by the concerned staff of MLTschool. The seminar, which was proposed by Sri Lankan staff to re-educate laboratory technicians in local areas to improve their techniques, improved the motivation of the staff. As the result, WHO and NARES started funding their increased research activities.

Moreover, although the purpose of this project was to provide fundamental facilities, equipment and technologies to MRI, this project has positive effects on various fields, because MRI is the only integrated medical research institution carrying out various tasks including diagnoses, education, assays, production and researches. In addition to the impacts on the basic tasks mentioned above, there are other positive effects on education and researches of MRI. Concerning education, MRI has responsibly instructed and trained students at the medical research school and nurses and other medical specialists. Concerning researches, medical students often visit MRI to study practical situations, and obtain

instruction and advices for experiments at their university from MRI staff. And the MRI staff also cooperates researches on microbes and pathology, and trainings for public institutions at which graduates of medical schools and universities are working.

In the department of vaccine, as the awareness of the staff has been raised, various changes were made. For example, a new technology was introduced for the quality test of typhoid vaccine. The staff members teach their technologies each other. And an effective immune test was introduced for patients who might have rabies.

Also some impacts are observed in the financial aspect. As the result of a research, the amount of a dose of rabies vaccine was reduced. Consequently, the costs for the vaccine were also reduced. And MRI became able to conduct some quality tests for vaccines which used to commission to reference laboratories in abroad. By this change, commission fees can be also saved.

Concerning the environment, because the facilities of MRI provide environmental protection measures such as a treatment procedure for radio active waste, there is no negative effect on the environment and human bodies.

(5) Sustainability

The operation ability of MRI is sufficient, because MRI has been independently operated even before this project starts. However, as MRI is under the authority of the MoH&IM, the ministry interferes with its operation whenever a policy is changed.

As for the technical sustainability, among main tasks of MRI including testing, education and researches, the amount of tasks for testing is outstandingly large. Research activities of MRI are hindered by those tasks as the staff members are wrapped up with them. Because these routine tests are also a fundamental task of MRI, other than researches and routine test, services such as assays, associated diagnoses and others should be shifted to a branch of MRI, which should be newly established. By introducing this branch system, the unstable financial conditions would be improved to promote the independent operation of MRI.

Regarding the financial condition, the budget allocated by the Government is not enough to repair and renew the existing equipment, which maintenance and updating are critical for testing and research activities.

For medical equipment provided in this program, two engineers take charge of its maintenance. Among them, one was trained in BES by a JICA second country training program. Most equipment is in good condition and frequently used through their efforts. However, some machines could not be repaired as their spare parts are not available in Sri

Lanka. It largely hinders the productivity and efficiency of MRI to sustain. The spare parts of air conditioners and the electronic microscope were provided by JICA in its follow-up program. There is equipment also provided by WHO and WB, which is well maintained and often used.

(6) Other achievement

A part of technologies transferred in this program is frequently used achieving some outcomes. However, further efforts are required to maintain and develop those technologies. At the time of the field work of this evaluation, there are very few staff members concerned with the program in MRI because more than 10 years have passed since its start. We considered that it was a great loss for MRI that the academic exchange of experts of MRI and Japanese research institutions has been stopped.

(7) Conclusion

In this program, facilities and main equipment were provided by the grant assistance. And according to the technical assistance plan, the following tasks were implemented; the dispatch of experts, the accepting of researchers, and the transfer of various technologies in associated fields with trainings in Sri Lanka. With these facilities, equipment and various support, MRI provided a foundation as a research institution with modern equipment concerning medical tests, reference, production, research and education. Also there are positive impacts of this program, such as the appointment as a reference center in West South Asia for polio virus by WHO, the launch of production of SPF experimental animals at the Animal Center, and the holding of a seminar by the concerned staff of MLTschool. Meanwhile, as facilities and technologies of MRI are improved, the amount of tasks for routine tests has been increased. These tasks hinder research activities which is one of the main goals of MRI.

3. Lesson Learnt

Although we confirmed the effectiveness of this program, there are currently few staff members concerned with the program at MRI. And after the completion of the program, MRI and dispatched experts and concerned institutions in Japan have not have opportunities to contact. Especially concerning the technical assistance for research institutions, their technologies would be maintained and developed further by information exchanges with other research institutions abroad including joint researches after the completion of the assistance. Therefore, while a program is ongoing, it is necessary to establish relationships with other institutions considering the possibility of joint researches after the program is completed.

4. Suggestion

As pointed out in the Completion Evaluation, at MRI, the amount of tasks for testing is outstandingly high comparing other main tasks such as education and research. The staff members of MRI, who are wrapped up with routine work, can not concentrate on their researches. Because these routine tests are also a fundamental task of MRI, other medical services such as assays, diagnosis and tasks other than researches should be shifted to a branch of MRI, which should be newly established. By introducing this branch system, the operation of MRI would be more simplified. And the unstable financial conditions would be improved to promote the independent operation of MRI.

5. Annex

【PDM_E】

Summary	Indicator	Performance	External Condition
Overall Goal To improve the capacity to control diseases in Sri Lanka	*Infant mortality rate*	*1990: 19.5, 1997: 16,3 (per 1000 infants)*	Ethnic conflicts
	Life expectancy at the time of birth	*1981:67.8(male), 71.7(female)* *1991: 70.7(male),75.4(female)*	
	The rate of children under the age of 5 who died by diarrhea	*1991: 2.9, 1996: 2.0*	
	The rate of children under the age of 5 who died by acute respiratory diseases	*1991: 8.3, 1996: 5.6*	
Program Objective *To function as a fundamental medical research institution, a reference laboratory and a educational institution*	*Process of organization reform*	*No large reform*	No particular condition
Project Objective *1.（By the grant assistance）to improve facilities and equipment at MRI* *2.（By the project-type technical assistance） to reinforce MRI's capacity (concerning diagnoses, education, reference, biologics and fundamental researches) in order to deal with infectious diseases in Sri Lanka*	*1 Specification of necessary equipment* *2 Recognition in the nation as a national fundamental medical training center*	*1 Facilities shown in the left were completed and equipment was provided.* *2. MRI has been recognized as the only integrated institution with modern equipment for medical research, tests and education.*	No particular condition

Output 1. MRI Construction Project (grant assistance) 2. Improvement of the capacity to diagnose 3. Improvement of the capacity concerning education 4. Improvement of the capacity concerning assays (reference) 5. Improvement of the capacity concerning the production of biologics 6. Improvement of the capacity concerning fundamental researches 7. Offering of new services	*1.* *2-1. Total number of diagnoses* *2-2. Routine tests* *3. Rate of staff members who passed the national examination* *4. Number of assays* *5. Types of produced vaccines* *6. Number of researches* *7. Number of used animals*	*1. The facilities and equipment shown in the left were provided.* *2-1. 1990: 52,154 1995: 81,954 2001: 155,843* *2-2. 1990: 48,476 1995: 55,223 2001: 99,267* *3. 1990: 95%, 1995: 95%, 2001: 100%* *4. 1990: 3,678 1995: 26,731 2001: 56,576* *5. Increased* *6. 1990-94: 45, 1995-99: 69, 2000-01: 23* *7. 1990: 1,911, 1995: 2,248, 2001: 3,617*	Counterparts who were transferred technologies settled in their jobs.
Input MRI Construction Project (grant assistance) Medical Research Institute (project-type technical assistance)	Outline 1 Provision of equipment and facilities (2.88 billion yen) 2 Long-term dispatched experts (4) Short-term dispatched experts (14) Accepted trainees (8) Equipment (89 million yen)		1 Materials and equipment sent from Japan passed the custom without problem.

MEDICAL EQUIPMENT MAINTENANCE AND MANAGEMENT

1. Program Summary and JICA's Cooperation

Program site

The front view of BES

(1) Program Background

Giving a high priority to improve health care services in the nation, Sri Lanka Government has promoted to improve and expand health care facilities and equipment mainly focusing on fundamental health care. In Sri Lanka, under the authority of the Ministry of Health & Women's Affaires (MoH&WA in short), Biomedical Engineering Services (BES in short) purchases, inspects and repairs medical equipment used in all public health care facilities. Because of the shortage of BSE's facilities and equipment, and its insufficient repairing skills, its maintenance activities were not efficiently implemented. To improve this situation, Sri Lanka Government sought a grant assistance from Japan to improve the facilities and equipment of BES, and a technical assistance to introduce an operation and management system and to improve repairing skills.

(2) Program Objectives and Overall Goal

This program was implemented to improve BES's maintenance and management skills for medical equipment and to reinforce its system.

(3) Program Scope

By the grant assistance, new facilities were constructed in the BES headquarters at Colombo city. And new workshop facilities were constructed in South Province providing new equipment for those facilities. The provided equipment was artificial respirator analyzers, precision lathes, electric-operated cutting machines, electric-operated folding machines, vehicles for on-site repairing, wagon-type vehicles, vehicles for delivering, trucks, prefabricated low-temperature rooms, personal computers. In fiscal 1993, an expert were dispatched to the country to carry out technology transfer for repairing, maintaining,

operating and managing medical equipment. A second country training and third country individual trainings were implemented from 1998 to 2001 and from 1996 to 2000 respectively using constructed new facilities and transferred technologies.

(4) Program Component

This program consists of the following projects.

- Project for Biomedical Engineering Services (grant assistance, 1.369 billion yen in fiscal 1991)
- Dispatch of an expert implemented 1993 - 1997
- Second country training implemented 1998 - 2001 (for medical equipment maintenance)
- Third country individual training implemented in 1996 (for medical equipment maintenance and management in India)
- Third country individual training implemented in 1996 (for medical equipment maintenance and management in Ghana)
- Third country individual training implemented in 1997 (for medical equipment and medical testing equipment maintenance and repairing in Tanzania)
- Third country individual training implemented in 1997 (for medical equipment maintenance and management in India)
- Third country individual training implemented in 1999 (for medical equipment maintenance and repairing in Kenya)
- Third country individual training implemented in 1999 (for medical equipment maintenance and repairing in Cambodia)
- Third country individual training implemented in 2000 (for medical engineering in Cambodia)
- Third country individual training implemented in 2000 (for medical equipment maintenance and management in Laos)

(5) Executing Agency

Ministry of Health & Women's Affaires

(6) Present Status of the Program/Viewpoint for Evaluation

Among the components of this program, the grant assistance and the dispatch of an expert were completed in 1993 and 1997 respectively. From 1998 to 2001, the second country training was being implemented. In parallel with the second country training, some facilities of BES have accepted trainees from third countries whenever necessary since 1996. In this report, we evaluated mainly the impacts and sustainability of this program because this evaluation was implemented as a Completion Evaluation based on the five items for evaluation.

2. Evaluation Results

(1) Relevance

Sri Lanka Government had actively introduced medical equipment from the 1980s improving and expanding health care facilities to provide substantial primary health care services. Japanese Government had supported the efforts adhering to Sri Lankan development policy, "Five Year Public Investment Plan". However, it was pointed out that the insufficient maintenance and management system for medical equipment hindered the sustainability. Consequently, the grant assistance of this program was implemented to reinforce not only BES's facilities and equipment but also its system because its maintenance and management system was not sufficient for improved facilities and equipment. The details and timing of this grant assistance were relevant considering the needs from Sri Lankans.

(2) Effectiveness

BES's activities were significantly expanded by the expert dispatched after the grant assistance was completed. The rate of repaired equipment at each hospital increased from 30 - 60 % in 1992 to 90 % in 1998 highly achieving the program purpose.

Concerning the technical level of BES, the repairing ability and the quality of services were improved with a newly established equipment-handling system especially improving equipment storing and long-distance delivering. Furthermore, by positioning vehicles for on-site repairing, maintenance plans for local areas became programmed.

However, the operation and management system of BES was not sufficiently improved. According to a beneficiaries survey conducted by asking 50 medical specialists at public hospitals using BES's services (shown in Table 1), 10 to 20 % of them are not satisfied with BES's services. They pointed out BES's systematic problems such as complicated producers to require services and unfairness to decide the order of repairs.

Concerning the outcomes of the second country training, repairing time for the target equipment of the training was reduced from 2 - 15 days to 1 - 2 days because the number of requests for repairing to BES was significantly decreased. Moreover, as the number of requests from local hospitals to BES was reduced, the costs for on-site repairing such as travelling expense and special payment paid for BES staff were decreased.

(3) Efficiency

The first plan of the technical assistance was a mini project-type planning to send two experts for a long term and other experts for a short term to support repairs, operation and management at BES. However, this plan was change to a technology transfer type sending an

expert for a long term to mainly instruct equipment repairing. Because, from the beginning of this program, both BES's technologies and operation had been required to be improved, the dispatched expert focused on improving BES's operation and management in his last fourth and fifth years in his term. However, BES still has operation and management problems hindering its efficiency.

In addition to the problems above, it was taken four years to choose the counterpart. It also negatively affected the efficiency of the technology transfer.

Concerning the second country training, because the attitudes of provinces for the training were different, preparation for the training was not smoothly implemented delaying choosing trainees. Generally, combination with each provincial government was insufficient.

Concerning the provision of equipment and facilities, technology transfer, second country training and third country trainings, their timings were efficient.

(4) Impacts

The following shows the results of a beneficiaries survey on services offered by BES conducted by asking 50 staff members working at public hospitals. Regarding BES's repairing, management and on-site services, 80 to 90 % of them recognized their improvement. And the large impacts of this program were proved by the fact that 50 % of them were very satisfied with BES's services. Concerning BES's repairing skills, 18 % of them answered "no change", indicating the shortage of repairing equipment and materials, and the low technical level of BES staff. However, according to the interview with the dispatched expert, the repairing ability of BES staff is sufficient and well maintained. For advanced equipment, a maintenance contract with its distributor is basically required for maintenance and repairing of the equipment.

< Table 1: Satisfaction Survey on Services offered by BES >

	Question	Answer	%
Repairing skills	The degree of improvement	Improved	41
		Almost improved	32
		Slightly improved	7
		No change	18
	The degree of satisfaction for repaired equipment	Satisfied	50
		Almost satisfied	36
		Not satisfied	7
Operation and management	BES's response to repair requests	Very quick	18
		Quick	64
		Not quick	18
	Accuracy of BES's response	Accurate	41
		Almost accurate	48
		Not accurate	7
On-site repairing	The degree of satisfaction	Satisfied	66
		Almost satisfied	23
		Not satisfied	5

With the technologies transferred in this program, the counterpart held domestic trainings, and implemented technology transfer to foreign engineers by his own. It was a remarkable impact of this program.

According to the interviews with the trainees of the second country training, the training curriculum such as its schedule and its level (fundamental level) was appropriate. For trainees, in addition to the acquired skills, there were positive changes in their awareness including that for the quality of routine work. These trainees expect further trainings for advanced level, and for equipment in each field.

As the Minister of MoH&WA highly evaluated this training, and as a newspaper account covering it was published, many medical facilities in Sri Lanka and neighbouring countries applied to participate to next training. Facilities in neighbouring countries were approved to participate to the training by the concerned office in Sri Lanka. Considering this fact, trainings for neighbouring countries are also required in future.

Concerning the third country trainings, BES engineers, who had only received the technical assistance before, changed their position to cooperate to promote those trainings. This change positively influenced their mind improving the consciousness of ownership.

Most BES staff members worked at the time when this program was implemented are still working at BES. Therefore the job settlement ratio at BES is relatively high.

(5) Sustainability

BES is now operated and managed by 128 of office workers and 100 of repairing staff members with unchanged system and scale since the start of this program. We considered BES will be sustainable.

After this program was completed, BES held second country trainings and third country trainings by itself. Therefore concerning the sustainability of repairing skills, no problem was posed.

Regarding BES's financial condition, the operation budget from the MoH&WA was increased from 200 million rupees in the year when this program was started to 875 million rupees in 1999. However, this amount of budget is not sufficient to purchase necessary spare parts and consumable items. Moreover, the budget for this program had covered the costs for the second country training which was just completed and the third country trainings implemented this program. However, as for future second country trainings and third country trainings implemented by BES, their uncertain financial background is very concerned.

(6) Other achievement

Although there was a negative effect on the efficiency of technology transfer because four years had been taken to choose the counterpart, this technical assistance achieved great outcomes improving the rate of completed repairs from 30 - 60 % in 1992 to 90 % in 1998. As BES implements second country trainings and third country trainings by itself after this program was completed, it is now accumulating its experiences and skills to become a medical equipment training center to cultivate engineers in neighboring countries in South West Asia.

(7) Conclusion

The purpose of this program was roughly achieved as necessary facilities and workshop equipment were provided by the grant assistance, and as the expert in repairing medical equipment was improved the rate of completed repairs to 90 %. This program achieved great outcomes and positive impacts although there were some problems to implement it, including the change of the plan for dispatching the expert, and the long delay of choosing the counterpart. Moreover, BES succeeded to expand these outcomes by holding second country trainings and third country individual trainings by itself. Though these activities, BES would be independently operated as a training center for neighbouring countries.

3. Lesson Learnt

The dispatched expert mainly contributed to succeed the second country training and the third country trainings. However, this success gave sufficient skills and confident to BES staff improving the sustainability of this program.

This program also significantly contributed to improve the sustainability of one of JICA's programs to support health care facilities, which was implemented after this program.

As the first plan was changed, this program focused on improving repairing skills as the target of technology transfer. However, the operation system of BES should have also equally improved.

4. Suggestion

Considering the condition of BES, a referral system should be established to maintain medical equipment. As repairing and daily inspecting are required to maintain medical equipment, repairing costs and waiting time for repairing would be reduced by providing a workshop at each hospital to implement daily inspections and temporary repairing. With these workshops, BES could focus on advanced repairing and functioning as a training center.

Furthermore, BES has already accumulated its skills and experiences to become a training center for the nation and neighboring countries. It will be a great advantage for Sri Lanka and neighboring countries that BES will function as a training center for engineers in neighboring countries who deal with similar medical equipment with similar maintenance skills to those in Sri Lanka.

5. Annex

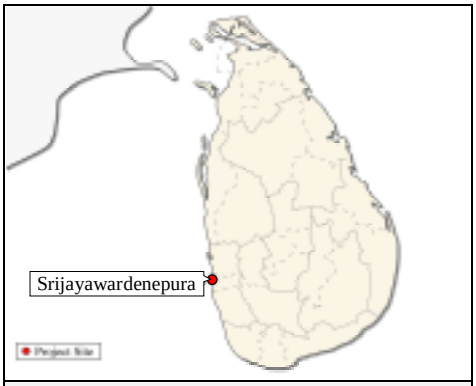
【PDM_E】

Summary	Indicator	Performance	External condition
Overall Goal To maintain and improve Sri Lankans' health conditions by improving health care services	* *Infant mortality*	*1990: 19.5, 1998: 16.3 (per 1000 infant)*	Ethnic conflict
	* *Birth rate of immature infants*	*1991:19.9, 2000: 17.3 (per 1000 infant)*	
	* *Life expectancy at the time of birth*	*1981: 67.8(male), 71.7(female)* *1996: 70.7(male), 75.4(female):*	
Program Objective *To improve BES's skills to manage and maintain medical equipment and to improve and*	*Average operating rate of equipment at hospitals in concerned areas*	*1992: 30-60%, 1998: 90%*	No particular condition

reinforce BES's system	*Evaluation for BES made by hospitals in concerned areas*	*A system to maintain equipment was established.*	
Project Objective 1. (By the grant assistance) to improve and reinforce BES's system to maintain and manage medical equipment 2. (By the dispatched expert) to improve BES's technical level 3. (By the second country training) to make participants acquire fundamental maintenance skills for medical equipment 4. (By the third country trainings) to improve skills of participants	*1 Specification of necessary equipment* *2 Annual number of repairs* *3 Average number of days required for repairing*	*1. The Facilities and equipment shown in the left were provided.* *2. 1992: 30-60%, 1998: 90%。* *3. Before:2 -15 days、 after:1-2 days*	No particular condition
Output The capacity of maintenance including repairing equipment was quantitatively and qualitatively improved (by the grant assistance). The technical assistance was completed by the dispatched expert. The second country training was implemented. The third country trainings were implemented.	1.1 Accuracy of repairing skills 1.2 Speed of repairing 1.3 Accuracy of on-site repairing 2.1 Survey on the operation system of BES 2.2 Technical assistance for repairing medical equipment 2.3 Preparation of teaching materials such as manuals for repairing medical equipment 3 Completion Evaluation by participants 4 Completion Evaluation by participants	1.1 Improved : 80% 1.2 Become faster : 82% 1.3 Satisfied : 89% 2.1 Implemented 2.2 Implemented 2.3 Prepared 3 The training and evaluation were implemented. 4 The training and evaluation were implemented.	The counterpart transferred technologies settled in his job.
Input A project to improve Rupavahini broad casting station (grant assistance) Dispatch of a expert A second country training Third country trainings	Summary 1 1.369 billion yen 2 Dispatched an expert in maintenance of medical equipment 3 Held together by BES and Japan 4 Held together by BES and Japan		1 Equipment and materials sent from Japan passed the custom without problems.

NURSING EDUCATION PROGRAM

1. Program Summary and JICA's Cooperation



Location Map of Project to Be Implemented

Photo

(1) Program Purpose

The main policies of Sri Lanka in the field of health and medical services include correction of regional gaps in medical services, improvement of public health care and increasing the number of persons involved in providing medical services. In view of the fact that there are 1,604 persons in the country's population for every nurse (figure for 1994), which is extremely low in comparison with the figure of one for every 100-200 persons in the population in advanced countries, mitigating that represents a big challenge. Because of that in 1994 the Sri Lankan government set the goal of increasing the number of nurses to 16,500 so as to have one for approximately every 1,000 persons in the population, the shortage according to that standard then being 5,635 nurses. Since the maximum number of nurses that the country can train in a year is 1,000, they are not able to cope with such great demand. To make matters worse, nurse training facilities have become run-down and obsolete, making it practically impossible to increase the number of trainees at them as they are now, and the deteriorated state of their training equipment, too, stands in the way of effective training of nurses.

Under such circumstances, for the sake of coping with the shortage of nurses and improving the quality thereof the Sri Lankan government then requested of the Japanese Government grant assistance for construction of a nurse training school with a capacity of sending out 100 newly trained nurses a year on grounds located next to the Srijayawardenepura General Hospital as well as technical assistance concerning nurses specialized in ICU, CCU, etc. After that, on the basis of a preliminary survey carried out in August of 1995, agreement was reached, regarding technical assistance, on

implementing a technical assistance project for the purpose of improving and upgrading the quality of training at the country's 10 other national nurse training schools on the basis of treatment of that nurse training school as a model case for improvement of the basic training of nurse training schools.

(2) Program Objectives and Overall Goal

The purpose of the program is to raise the degree of meeting the needs regarding nurses who have received up-to-date nursing education and training.

(3) Program Scope

On the basis of that grant assistance, nursing school buildings (management and training building, common-use facilities and dining hall building, accommodation building, etc.) were constructed on grounds neighboring the Srijayawardenepura General Hospital, and at the same time educational equipment (equipment for basic nursing practical training, human anatomy models, audio-video equipment, minibus, etc.) was provided. The technical assistance carried out in that project was as follows:

- Making it possible to assess the actual situation regarding nursing education throughout the country
- Creating a new model for running nursing schools
- Completion of a new model for methods of nursing training
- Completion of formation of a model nursing training environment

(4) Program Component

This project is comprised of the following two separate projects:

- Plan for Establishment of the Srijayawardenepura National Nursing School (on the basis of grant assistance in the amounts of 91 million yen in 1996 and 1,445 million yen in the period 1997-1998)
- Project for Nursing Education (project-type technical assistance extending from October 1996 to September 2001)

(5) Executing Agency

The project implementing agency is the Ministry of Health, Highways and Social Services (hereinafter referred to as "the Ministry of Health").

(6) Present Status of the Program/Viewpoint fro Evaluation

With ending in September 2001 of the project-type technical assistance designated "the Project for Nursing Education in Sri Lanka," both of the individual projects comprising

it also ended. Furthermore, a study team was sent to Sri Lanka in April 2001 for evaluation of the project-type technical assistance at ending thereof. That being the case, this evaluation is after-the-fact evaluation of the program. Although the evaluation covers five items, the emphasis in it has been placed on investigation of the impact, including further independent development impact, of the project.

2. Evaluation Results

(1) Relevance

Faced with a situation of ongoing insufficient number of persons involved in provision of medical services and a particularly serious problem of too few nurses, the Sri Lankan government set the goal of increasing the number of nurses to 16,500 so as to have one nurse for approximately every 1,000 persons in the population by 1994, but that target was achieved by only about 50.6% in view of an actual figure of only 11,135 nurses in that year, or 5,635 short of it.

Furthermore, since the facilities and equipment of the Srijayawardenepura National Nursing School, the object of the request for assistance, have become deteriorated, along with the problem of not enough space to increase the number of students, it can be said that the project was geared to Sri Lanka's development challenges and needs.

(2) Effectiveness

The project goals of establishing and operating and enhancing the functions of a model school in terms of basic nursing can be considered to have been attained for the most part as explained below thanks to wholehearted efforts of the experts and other people concerned, but there are still major remaining challenges facing the Sri Lankan side regarding those things (see the section "Proposal" for elaboration on that).

Thanks to project assistance provided the Ministry of Health, the curricula of nursing students were revised in 1999 for restandardization of theoretical and practical training methods and dissemination to nursing schools throughout the country.

Improvement of the teaching capacity of the staff of the Srijayawardenepura Nursing School, procurement and maintenance and management of equipment for it and compilation of a practical training guidelines handbook have been accomplished on the basis of the cooperation of the staff of the nursing school, and as a result that nursing school has come to be recognized as a model for national nursing schools in Sri Lanka.

Qualification for admission to the nursing schools has been upgraded from level O to

level A, and a forum of the rectors of 12 nursing schools for discussion of nursing education has come to take place regularly.

(3) Efficiency

This project has been a good one in terms of efficiency thanks to its two-directional approach, i.e. that of provision of necessary facilities and equipment on the basis of grant assistance and technical improvement based on technical assistance. Furthermore, it can be said that the technical assistance started in advance bearing in mind when the facilities would be completion was carried out with appropriate timing.

However, although the Ministry of Health, under the purview of which the nursing schools lie, has a strategy of strengthening human resource development in its health policies, present priority of nursing facilities and equipment in its budget allocations is low. Although the Srijayawardenepura Nursing School has been built as a model school on the basis of Japanese grant assistance, there are factors on the facility side impeding efficient training at the other ten nursing schools.

Besides that, nursing education is treated on the same level as vocational training, there being a clear difference in awareness of importance between it and education of physicians and dentists, which is under the purview of the Ministry of Higher Education. That is a reflection of the fact that nurses are considered mere labor in the form of assistants of physicians.

The plans called for 7 more nursing instructors for the 1st-year students in the new school year and an increase of 12 instructors by the time that the freshmen became 3rd-year students, but now that they have become 3rd-year students, there is still instruction of the general type by only 5 instructors (the kind of instruction that in Japan is accomplished in elementary schools, i.e. that without any instruction by teachers trained in specialized fields). Such instructor deficiencies are having a negative impact in terms of project efficiency and impact.

On the other hand, assessment of facilities and instructional materials and equipment yields high points, including the frequency of use thereof, and cleaning of the facilities is thorough and management of equipment good.

(4) Impacts

A questionnaire was distributed to those concerned at the Srijayawardenepura Hospital, the place that serves as a practical training hospital for nursing students, and at the Colombo South Hospital as regards the knowledge and technical skills acquired by nursing students who had received instruction under instructors that had benefited from

improved curricula as a result of the project and from technology transfer and concerning their attitudes toward patients. On the whole, the results were good, but redoubled efforts will be necessary in the future in connection with attainment of the long-term overall goal.

On the knowledge side, the respondents answered that all of the students "correctly" or "just about correctly" acquired what was expected of them, and regarding keeping of nursing records, 94% of them answered that they could "just about correctly" keep them. Regarding knowledge of patients' diseases and medicines, about 85% of the respondents said that the students had "sufficient" or "just about sufficient" such knowledge. As for ability to adequately cope with change in patients' conditions, 26% of the respondents answered that it was inadequate, but there should be improvement in that respect as the students get more experience.

On the technical side the questionnaire shows that all of the students have fairly well acquired what is expected of them as regards how to handle patients with contagious diseases, how to check vital signs, how to properly wash their hands before an operation and how to administer medicine in accordance with prescriptions. A satisfactory 82% of respondents also said that that students "are able" to change patients' positions and move them correctly from place to place.

As for nursing attitudes, although they have fairly well learned what is basically necessary regarding taking of notes on the patient's condition and consulting hospital staff, matters like reporting of change in the patient's condition and nursing mistakes are still somewhat problematic. It can be said that the hospital's work control and management system is reflected in the nurses' work capacities.

There is no particular environmental impact.

(5) Sustainability

In Sri Lanka the health and medical services of public institutions is free of charge and characterized by a high degree of confusion and disorder. Since doctors, nurses and other staff are not remunerated according to how they perform, the quality of service varies considerably. With dissemination and taking hold of the nursing guidelines formulated in the project, the quality of nursing should come to be assured, but since the project has only just been completed, we have to wait to see the necessary efforts for that (see the section "Proposal" for a more detailed account).

The school does not have sufficient accommodation capacity for adoption of a system of all students staying in a hostel. Although the Ministry of Health had its own plans to

build an additional hotel, it has not been able to do so because of time and budget considerations.

Most of the country's nursing schools are in financial difficulties. The Ministry of Health pays nursing students 4,500 Rs. a month, and that is becoming a big financial burden on it as the number of students increases.

There are not enough instructors at any of the nursing schools, it often being necessary for an instructor to teach 5-6 different courses. That situation is clearly exemplified by the Srijayawardenepura Nursing School in that it has a student quota of 300 and only 5 instructors.

(6) Other achievement

Although there was some difficulty in communicating with the nurses in view of the fact that their foreign language capacity is not as good as that of doctors, there was a good communicative relationship between the experts and their counterparts, and that made it possible to achieve considerable success in technology transfer.

It is of considerable significance that the daily activities of the Japanese experts, including their attitude toward the patients and their posture in providing guidance to the students, had the effect of reforming the awareness of their counterparts. For instance, before commencement of the project nurses were thought of as being mere labor for assisting doctors, no one having ever thought about things like holding seminars and otherwise striving to raise their technical level. Furthermore, nursing students were used as labor to make up for the shortage of nurses on the job, meaning that instruction time was cut to a minimum to leave lots of time for the students to do "hospital practical training," i.e. actually just provide necessary labor. But the new curriculum puts more emphasis on the fact that the trainees are first and foremost students, including allocation of time for utilization of library facilities, and that is a big step forward.

(7) Summary

Shortage of nurses is a serious problem in Sri Lanka. The project goals of establishing, running and improving the functioning of a model nursing school has been for the most part attained as described below thanks to the efforts of the experts and the others concerned, but there remain considerable challenges on the Sri Lankan side. Raising of the degree of meeting of the country's needs for nurses that have received modern training will depend on still greater efforts on the part of the Sri Lankan side. There are many problems to be solved besides that of not enough nurses, including the shortage of instructors, too much time devoted to labor in the name of practical training, varying quality of service and the low status of nurses. According to what the implementing

agency has ascertained, greater emphasis will now be placed on development of human resources as a challenge in development of health and medical services.

3. Lesson Learnt

Since the WHO, too, is interested in the nursing problem in Sri Lanka and has sending of experts and other specific efforts scheduled, working with that organization in promoting Japanese assistance in that field will enhance the effectiveness of such efforts.

However, use of nursing school students to make up for shortage of labor and the low status of nurses are a reflection of the low priority given by the Ministry of Health to budget allocations to nursing school facilities and equipping of them. That being the case, it is important to pay great attention in the future to checking and confirming Sri Lanka's efforts to help itself in connection with providing support to nursing education in that country, which still faces so many challenges.

4. Suggestion

Policies Concerning Nursing :

- Instead of considering nurses to be just assistants of doctors, making training of them a high-priority task as manpower needed in order to raise the level of health of the people of Sri Lanka.
- Correcting the present severe working conditions of nurses on the basis of analysis of their work assignments in hospitals.
- Reviewing of nursing school budgets and separating nursing schools from hospitals so as to make it possible to manage and operate them independently.
- Setting up of a post in the Ministry of Health for a person whose task it would be to oversee the situation regarding nursing in national hospitals.
- Reduction of the load on hospitals by revising the division of roles and reinforcing functions in regional public medical services.
- Increasing the budget for development of human resources in the field of health services and making nurse training (including training and grooming of nursing school instructors) a high-priority item.

Development and Vitalization of the Capacities of Nurses :

- Working for improvement of the quality of nurses and nursing education through promotion of assistance by foreign experts.

- Development of nursing associations as organizations for tackling the different problems concerning nursing.
- Strengthening of the functions of post-graduate educational organizations (PBS) for upgrading of both the quality and the quantity of nursing school instructors.
- Sustaining and further developing the forum of nursing school rectors.
- Collection of information on nursing at private hospitals.

Operation of the Srijayawardenepura Nursing School as a Model School :

- Having continuation of linkage between the Srijayawardenepura General Hospital as a practical training hospital in nursing education and the Kayboira Hospital and the Homagama District Medical Center under the leadership of the rector of the Srijayawardenepura General Hospital.
- Strengthening of the functions of the Srijayawardenepura General Hospital as a model school so that it can continue to serve as the vanguard of theoretical and practical educational methods.
- Formulation of instructor exchange programs between the model school and the 10 other schools for the sake of dissemination of new teaching methods to all of them.

Management and Operation of Nursing Schools :

- Strengthening of the powers and functions of rectors and vice rectors regarding nursing school management and operation.

5. Annex

【PDM_E】

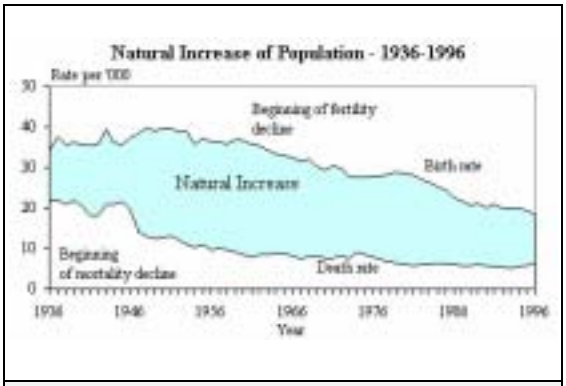
Summary	Indicators	Performances	External Conditions
Overall Goal Raising of the level of nursing services in Sri Lanka	Situation regarding course of career and placement of graduates		Civil conflict
	Numbers of public health nurses and midwives trained	Public health nurses: 5,445 in 1994 and 5,972 in 1999 Midwives: 2,214 in 1994 and 2,503 in 1999	
Program Objective Raising of the degree of meeting needs in Sri Lanka regarding nursing personnel who have received modern education	Ratio of number of nursing personnel to population (%)	1994: 0.073 1999: 0.075	
	Number of nursing personnel per doctor	1994: 3.73 1999: 2.15	
Project Objective 1. Contributing to mitigation of shortage of nursing personnel (through grant provision of equipment)	1. Lowering of the ratio of population to number of nurses.	1994: 1,367, 1999: 1,334	
2. Establishment and effective functioning of Sri Lankan National Nursing School (on the basis of the results of project-type technical assistance)	2. Establishment and functional operation of Sri Lankan National Nursing School.	2. Operation of the school is coming along smoothly.	
Outputs Establishment of Srijayawardenepura Nursing School (on a grant basis). Implementation of effective nursing education at the new nursing school.	1. Establishment of nursing school 2-1 Appropriate allocation of number of students with respect to number of instructors. 2-2 Appropriate implementation of	1. Those facilities and equipment were provided. 2-1 16-17 students/instructor (planned) versus 60 students/instructor in 2002 2-2 Implemented. 2-3 Started in August 1999, and therefore no students yet qualified for taking the examination.	Settling in of counterparts who have undergone technology transfer

Improvement of the quality of instructors at all national nursing schools around the core formed by the new nursing school. Improvement of management and operation of all national nursing schools around the core formed by the new nursing school. Improvement of clinical practical training of nursing students at all national nursing schools around the core formed by the new nursing school. Provision and effective use of educational equipment at all national nursing schools and practical nursing training hospitals in Sri Lanka.	curricula. 2-3 Rise in the percentage of students passing final examination. 3-1 Formulation and utilization of appropriate teaching guidelines and materials. 3-2 Planning and holding of seminars concerning education. 4. Formulation and implementation of different kinds of regulations and work rules. 5-1 Implementation of appropriate teaching. 5-2 Strengthening of educational linkage between schools and hospitals. 6. Provision of educational equipment and materials as scheduled.	3-1 Formulated and implemented at the new school but without spreading to other schools yet. 3-2 Such seminars are being held at the new school but not at the other schools yet. 4. Insufficient. Regular holding of meetings of the forum of rectors of schools throughout the country. 5-1 Insufficient. 5-2 At the new school regular meetings are held before commencement of practical training, but such meetings are not held on a regular basis at the other schools. 6. Adequate use is made thereof at the new school but not yet at the other schools.	
Inputs Project for Establishment of the Srijayawardenepura National Nursing School (grant aid) Nursing education (project-type technical assistance)	Summary 1 1,445 million yen 2.5 148 million yen	1. Provision of equipment and facilities 2.1 Sending of experts on long-term basis 2.2 Sending of 3-4 experts/year 2.3 Sending of experts on short-term assignment 2.4 Receiving of trainees 2.5 Provision of equipment	

INFORMATION SYSTEM PROGRAM

1. Program Summary and JICA's Cooperation

Locational Map of Project to Be Implemented



Natural Increase of Population

(1) Program Purpose

Sri Lanka's population growth is 1.6% (1980-87), which is a fairly high rate compared with Japan (0.4%) and other advanced countries. The Sri Lankan government has been promoting family planning, including birth control and educational efforts, since 1953, but formulation of an effective population policy has been hindered by factors such as insufficiency of accurate population data, lack of promptness in furnishing of information and inadequate preparation of a system for utilization of such information. Because of that, the Sri Lankan government asked Japan for, and received, assistance aimed not only at promotion of implementation of family planning but also at more organized accomplishment of formulation and implementation of policies concerning population through prompt furnishing of different administrative agencies with information concerning various aspects of population. Furthermore, in the end-of-project evaluation carried out in 1990 it was judged that assistance was needed, within the scope defined in the master plan indicated in the R/D, regarding a) improvement of the population statistics system and b) development and utilization of a population statistics data bank for the sake of making the population census to be carried out in 1991 a success, and the project was therefore extended.

(2) Program Objectives and Overall Goal

1. Creation of databases concerning population and health statistics and building a population statistics data bank for improvement of the population dynamics statistics system.
2. Improving the precision of population censuses, population dynamics statistics, health and medical service statistics, etc.

(3) Program Scope

Working for improvement of the precision of population statistics and speeding up of furnishing of population and similar data by preparing a population data collection and analysis system on the basis of provision of equipment and technology transfer in line with the implementation plan described below and by building family registration and various other computer-based databases:

a. Building of population statistics data bank
b. Improvement of the population statistics system
c. Development and utilization of a population statistics data bank

(4) Program Component

This program is comprised of the following three individual projects:

- Population Information Project (project-type technical assistance, November 1987 – November 1990)
- Extension of the above (November 1990 – November 1992)
- Individual sending of experts (population statistics) (May 1993 – December 1993)
- Individual sending of experts (population science) (December 1994 – February 1995)

(5) Executing Agency

· Statistics Bureau, Ministry of Planning and Planning Implementation (DCS)

(6) Present Status of the Program/Viewpoint fro Evaluation

After the project was extended, the technical assistance ended in November 1992. This evaluation has been carried out from the viewpoint of 5 evaluation items, and as after-the-fact evaluation it has centered on examination of the impact and sustainability of the project.

2. Evaluation Results

(1) Relevance

Since the sixties Sri Lanka has treated the population problem as one that has to be dealt with on the basis of major policy measures. 1968 saw establishment of a Family Planning Bureau in the Ministry of Health, and in 1973 a Population Bureau was set up in the Ministry of Planning as an agency for overall coordination and adjustment of population policy, and those new organizational units have been in operation since then.

In the eighties past substantial efforts in the way of implementing and promoting of family planning aimed at checking population growth were continued, but formulation of effective population policies was hindered by insufficiency of accurate population information, lack of promptness in furnishing of population-related data and inadequate preparation of a system for utilization of such information. That being the case, the overall goal of "improving and upgrading the population statistics sector to make it possible to have effective furnishing of population information for the sake of improvement of Sri Lanka's family planning efforts and health and medical services in general" is in line with the country's national policies.

What has been lacking the most in Sri Lanka's measures for dealing with the population problem is provision of effective population information, the level of statistics on population dynamics and population forecasts and statistics on socioeconomic data relating to the population problem having been particularly low in both qualitative and quantitative terms, and hence the great need that there has been for improvement and upgrading of the population statistics sector.

(2) Effectiveness

The three areas of project undertakings have been 1) building of a population data bank, 2) improvement of the population statistics system and 3) further development and utilization of the population data bank, and in spite of the activity obstructing factor of domestic political unrest the basic element of the project, i.e. 1) building of a population data bank, can be said to have been achieved to a satisfactory degree.

Regarding 3) of the preceding paragraph, with installation of personal computers and accomplishment of technology transfer at the DCS's local branch offices, wide use has come to be made of the population statistics data bank not only by the Family Planning Bureau, the Ministry of Health, the Family Health Bureau, the Family Planning Association and other public entities but also by private organizations, including NGOs, and the population information prepared by the DCS is now being effectively used in administration. However, because of inadequate building of an experimental population information network the result has been limitation to exchange of information between local branch offices of the DCS by e-mail and the Internet.

Regarding 2), it could not be attained just at the level of computer processing. Since there was not exactly complete adequacy regarding parts that needed support from the areas of population statistics and population science, the project was extended with placement of emphasis on implementation of the 1991 population census and tallying the figures from it. Computer processing and forming of a database of the results of the 1991 population census were supposed to be the crown capping the technology transfer

accomplished in the program, but the census was canceled because of the public security problem, making it impossible to carry out such processing and database formation, which had a very big adverse effect on the validity thereof.

(3) Efficiency

It is a fact that smooth implementation of the project was hindered by the influence of the long-drawn-out social unrest in Sri Lanka. Efficiency was lowered by circumstances like lateness in carrying out the implementation study and in distributing personal computers to the local branch offices and inability to go to work on some days.

It was necessary to make technical improvements in the preparatory stage concerning things like survey design and tallying methods for the sake of getting the data in expeditiously from the population census scheduled to be carried out in 1991, and under those circumstances extension of the projects was decided with appropriate timing. But in the end the 1991 population census was canceled on account of the external factor public security. To make up for that, a population survey was carried out with the assistance of the experts, but the efficiency thereof was low.

In implementation of the project a network system linking the local branch offices by modem was set up, but it did not function very well because of the poor state of the country's communications infrastructure. A more adequate survey should have been carried out prior to drafting of the project plans. In this evaluation survey there was exchange of information with local branch offices using e-mail and the Internet.

In the questionnaire survey of the implementing agency we got the answer that there was not adequate timing of sending of short-term experts for the purpose of technology transfer.

At the time of implementation of the project use was made of the computers included in the procured equipment, but when it came to the time of evaluation, not even one of those computers remained, that being due to the physical circumstance of rapid change in computer models, which made it impossible to have compatibility with current software using the old models. They are presently using computers distributed by the World Bank in a program for coping with the Y2K problem.

(4) Impacts

The birth rate in Sri Lanka was 2.8 in 1987, when the project got started, and 2.3 when it ended, and by 2000 it had declined to 2.0. Although one can hardly say that that decline was due to implementation of the project, it can be said that implementation of the project resulted in furnishing of necessary data and that that contributed to policy

formulation regarding appropriate family planning.

Thanks to the project it became possible for information to be collected on the national and municipal government levels and by researchers, which sped up data analysis and preparation of reports.

(5) Sustainability

In the population statistics sector the work is still being continued as it was at the time of implementation of the project, with a good percentage of the counterparts still working in the same places as they were then.

As for the sustainability of the technical aspect, according to a survey of the implementing agency the efficiency of preparation and implementation of the population census carried out in 2001 was enhanced by the technology transfer that took place in this project, which means confirmation of technology sustainability. The work of processing of data collected in the population census that they carried out on their own in 2001 is now under way.

The transferred technology has been applied not only to the population census but also to data collection and processing and calculation work by the project counterparts. Furthermore, the degree of technology sustainability has been confirmed by the number of seminars held since the project ended. Because of cancellation of the originally planned population census, there was decline of work incentive in addition to such problems as the physical problem of inability to cope with current software owing to rapid model change in computers, and as a result hardly any training has been accomplished. Using the computers provided by the World Bank in 2000 and 2001, they held different seminars on their own in preparation for their population census of 2001, and that amounts to confirmation of sustainability of the basic technology transferred in the project. Nevertheless, support of experts is needed for preparation and improvement of easy-to-use new databases.

<Number of Seminars/Training Courses by Counterparts>

Title of Seminar/Training Course	Number of Seminars			
	1990	1995	2000	2001
Basic training course — DOS, dBase III, Lotus, Symhony, SPSS	13			
Windows			8	2
Power point		1	1	1
MS. ACCESS			1	
Windows graphics			1	
SPSS		2	1	2
IMPS			1	
Visual Basic			1	
Photo Shop				1
Page Maker				1
Database management module for local staff				1
IMPS and Cs Pro			1	
National income account			1	
Statistical techniques				1
National census techniques			2	7

(6) Other achievement

In spite of the unstable political situation in the country, technology transfer concerning computer processing was fairly well achieved thanks to the efforts of the Japanese experts and the enthusiasm on the part of the counterparts. Regarding the Japanese experts and coordinators, the implementing agency, too, has expressed high regard for the quality of their work.

The experts frequently visited the main agencies that would themselves benefit from attainment of the project goals, striving to achieve results exactly meeting the needs of the beneficiaries and adjusting the scope of the project according to the progress of the activities, thus coping with the actual circumstances in carrying the project forward, and that helped to bring about major change in the awareness and attitudes of the counterparts.

(7) Summary

Sri Lanka has long put a great deal of effort into implementation and promotion of family planning in order to check population growth, but insufficiency of accurate population information, lack of expeditiousness furnishing of information and insufficient preparation of the system for utilization of such information are factors that have impeded drafting of effective population policy. That being the case, the overall goal of "working for improvement and upgrading of the population statistics sector and thereby making it possible to acquire effective population information so as to raise the level of Sri Lanka's family planning activities and health and medical services in general" is in line with the country's government policies.

However, smooth progress in implementing the program was hampered by delay in distribution of computers to local branch offices and by an unsafe domestic situation in which people could not even always manage to get to work. Furthermore, cancellation of the population census that was scheduled to be carried out in 1991 had a big negative impact on the effectiveness and efficiency of the program. But in spite of such unfavorable circumstances it was possible to achieve technology transfer and training thanks to the efforts of the Japanese experts and their counterparts.

3. Lesson Learnt

It was possible to establish a relationship of mutual trust thanks to the frequent discussions between the experts themselves and between them and the counterparts and to the fruits of visiting the beneficiaries to study needs and confirm the findings, and that constituted a factor that worked in favor of success of the project in spite of the difficult circumstances caused by the unstable political situation.

A network system linking the local branches by modem was created, but it did not function very well because of the poor state of the communications infrastructure in Sri Lanka. The impediment was failure to sufficiently survey the situation before drafting the plans, and that serves as a lesson concerning the importance of appropriate prior investigation.

4. Suggestion

Since computers are subject to rapid model change, it is necessary to secure and allocate the budgetary means of replacing them when necessary.
In view of the changing times in which large-quantity data processing is constantly increasing, it is necessary to devise appropriate measures concerning communications facility networks and other basic socio-economic infrastructure.

Besides the technology of computer processing, it is important to improve surveying techniques for the purpose of improving the precision of the data itself.

5. Annex

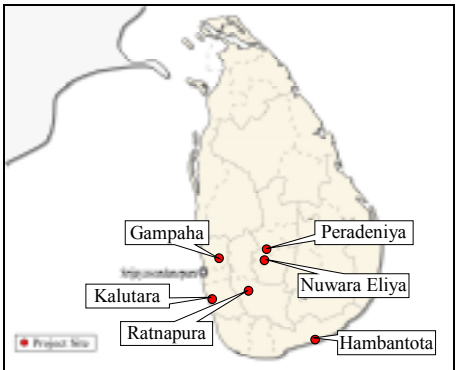
【PDM_E】

Summary	Indicators	Performances	External Conditions
Overall Goal Improving and upgrading the population statistics sector so as to make effective population information possible, thereby enhancing Sri Lanka's family planning programs and health and medical services in general.	Degree of contribution to determination of population and family planning policy	It has become easier for national and municipal government policy formulators and researchers to acquire necessary information, which has speeded up data analysis and drafting of reports.	Civil conflict
Program Objective Completion of building of population statistics data bank at the DCS so as to make possible computer processing of the results of the 1991 population census and formation of databases on that basis.	Degree of utilization of population statistics data	Building of the system had been just about completed, and preparations had been made for the 1991 population census, but it was not possible to form databases because of the fact that the census was canceled.	
Project Objective Completion of building of a population statistics data bank at the DCS and commencement of utilization of population information on that basis and at the same time building an experimental population information network linking two or three of the 25 administrative districts.	1. Degree of utilization of population statistics data 2. Degree of utilization of population information network	Frequent utilization in many areas. Has not functioned satisfactory because of bad telephone circuits.	The communica-tions network is stable.
Outputs Population statistics data bank being built. Population census system being improved. Population dynamics	1. Degree of actual accomplishment of building of population statistics databases 2. Degree of use of the transfer technology	1. All 6 of the planned items were formulated. 2. Although the 1991 population census was not carried out, the technology was used in the 2001 population census. 3. Improvement was necessary at	Counterparts who have received technology transfer have stayed in their jobs.

statistics system being improved. Statistics processing and analysis techniques being improved. Network system experimentation being started.	in population censuses (1991 and 2001) 3. Degree of utilization of the transfer technology in the population dynamics statistics system 4. Development and utilization of population estimation techniques 5. Development and utilization of derivative estimation techniques	the data collection stage. 4. It cannot be said that it was sufficient. 5. It cannot be said that it was sufficient.	
Inputs 1. Experts 2. Provision of equipment 3. Trainees 4. Individual sending of experts	Summary 1-1 Long-term experts (5) 1-2 Short-term experts (5) 2. Computers, etc. 3. 6 trainees 4-1 Population statistics 4-2 Population science		1. Civil conflict

REGIONAL HOSPITAL PROGRAM

1. Program Summary and JICA's Cooperation



Locational Map of Project to Be Implemented

The exterior of Ratnapura General Hospital

(1) Program Purpose

Since 1980 Sri Lanka has laid emphasis on primary health care (PHC), working to establish and improve regional hospitals (provincial hospitals and key hospitals) as the core of provision of local medical services. However, there is still great variation from region to region regarding medical services as illustrated by the fact that the mountainous Nuwara Eliya area has an infant mortality rate of 28.9 per 1,000 (1991-92), which is considerably higher than the nationwide average of 17.7 per 1,000. Furthermore, some key hospitals not only do not have a surgery clinical department but also have only a low level of equipment and facilities, making it impossible for them to provide the kind of medical services expected of a key hospital. That being the case, Sri Lanka asked Japan to provide grant aid for the "2nd Regional Hospital Establishment Project" covering eight regional hospitals in Sri Lanka. As a result of the basic design study Japan decided to provide that aid, but only for four regional hospitals and one training hospital, excluding the three regional hospitals in the northeastern part of the country, where political unrest reigned.

Likewise, the infant mortality rate of Ratnapura District is 20.9 per thousand (versus a national average of 16.3 per thousand), ranking it among the worst of the 25 districts in the country, that being an example of the big gap between urban districts and rural districts. Because of that situation Sri Lanka formulated the "Ratnapura General Hospital Improvement Project" and requested grant aid of Japan to cover the funds needed for new installation and improvement of wards of that hospital and replacement of medical equipment.

Regarding improvement of regional hospitals, medical equipment (surgical, obstetric, X-ray and clinical testing equipment and ambulances, etc.) was distributed to ten regional hospitals in 1985 under the grant-aid "Regional Hospitals Improvement Project." Furthermore, for the sake of sustainability of the procured equipment the "Medical Equipment Maintenance and Management Facilities Improvement Project" was completed in March 1993 on a grant aid basis for the purpose of establishing a maintenance and management system for the equipment.

(2) Program Objectives and Overall Goal

The objective of the program was to narrow the gap between the area in question and other regions as regards the state of health of its inhabitants.

(3) Program Scope

On the basis of grant aid medical equipment (surgical, obstetric, X-ray and clinical testing equipment and ambulances) was allocated to four regional hospitals and one educational hospital. Furthermore, the "Ratnapura General Hospital Improvement Project" is presently under way, with improvement of water supply and wastewater treatment facilities and incineration facilities as well as extension and remodeling of hospital buildings and allocation of medical equipment being scheduled in it.

(4) Program Component

This program is constituted by the following two individual projects:

- 2nd Regional Hospital Improvement Project (grant aid, 1992, 596 million yen)
- Ratnapura General Hospital Improvement Project (grant aid, 554 million yen in 1999 and 1,428 million yen in 2000-2002)

(5) Executing Agency

Ministry of Health and Traditional Medical (hereinafter referred to as "the Ministry of Health").

(6) Present Status of the Program/Viewpoint fro Evaluation

Of the projects constituting this program, the grant-aid "2nd Regional Hospital Improvement Project" was completed in March 1994, and the "Ratnapura General Hospital Improvement Project" is present being implemented. Regarding the first of those two, its after-the-fact evaluation study has also been completed. In the present after-the-fact evaluation of the program the point of view has covered 5 items, particularly focusing on program impact and sustainability. As for the latter project in the program, emphasis has been placed on consideration of relevance given the fact that

it is still under way.

2. Evaluation Results

(1) Relevance

The health and medical service policy of the Sri Lankan government established in the 1980's was based first and foremost on the basic principle of improvement of primary health care, and one of its priority challenges was identified as "widening of the scope and improvement of the quality of medical services with emphasis on correction of regional imbalances," and the "2nd Regional Hospital Improvement Project" was formulated along those lines and therefore can be considered to have been relevant. Furthermore, although some areas in the northeast have not been included in the coverage of the program because of the political unrest there, a large percentage of the population of Sri Lanka live in the areas that are covered by it, including rural areas where medical facilities are inadequate, and hence the considerable trust in and expectations of the hospitals undergoing functional reinforcement on the part of the residents of those areas and the conclusion that they are what those residents need.

Similarly, the goals of the "5-Year (1999-2004) Health and Medical Services Development Plan" include correction of regional inequality in health care and redistribution of medical care resources so that all of the people of the country can benefit from health and medical services, and in specific terms the plan identifies improvement of regional hospitals as cores of regional medical services as one of its priority aims. The plan places particular emphasis on southern regions, including the Ratnapura District, and therefore it has been established that the "Ratnapura General Hospital Improvement Project" is in line with Sri Lanka's development plans and relevant.

(2) Effectiveness

About ten years have passed since completion of the "2nd Regional Hospital Improvement Project," and the hospital director at that time is no longer there. Furthermore, data collection was not and even now is not collected systematically, and therefore accurate figures were not available, but nevertheless it has been possible to ascertain as follows the change in the state of activities of the five facilities in question resulting from implementation of this project on the basis of interviews and other data.

Table 1: Change in State of Activities as a Result of Project Implementation

	↑↑	↑	→	↓	↓↓	No Reply
Number of patients transferred (from primary medical facility to the hospital in question)	3	2				
Number of patients transferred (from the hospital in question to tertiary medical facilities)	2	2		1		
Number of outpatients	2	3				
Number of X-ray examinations	2	3				
Number of examinations	3	2				
Number of operations	4	1				
Average X-ray examination time per patient			2	2	1	
Average examination time per patient			2	2		
Average waiting time per patient	1	1	1	2		
Average time of receiving medical care per patient		1			4	
Average number of examination items per patient	2	3				
Hospital bed occupancy	2	2				1

Note: ↑↑: Sharp increase. ↑: Increase. → : No change. ↓: Decrease. ↓↓: Sharp decrease.

From the above table one can see that as a result of provision of equipment in implementation of the project and effective utilization thereof there was improvement in the medical services of the hospitals in terms of things like tests and examinations that were previously not possible becoming possible, and one can thereof say that the project objective of "improvement of the capacity of the hospitals covered by the project to provide medical services" was fairly well achieved. According to the data of the Peradeniya educational hospital, one of the facilities covered by the project, the number of patients transferred to it declined, but that was due to the fact that lower-ranking facilities had become more capable of providing appropriate services as a result of having been strengthened, making it less necessary to transfer patients from them to the Peradeniya educational hospital, the top referral hospital. Furthermore, the reason why the bed occupancy rate declined at the Gampaha key hospital, one of those covered by the project, is a big increase in the number of beds at it made possible by a soft loan from the Republic of Korea.

(3) Efficiency

The equipment was allocated in an expeditious and organized manner, and the assistance was appropriately provided according to plan. Furthermore, since design of the specifications and quantity of the equipment, too, was quite appropriate in line with the local needs, it is still being used now.

(4) Impacts

Regarding the impact of implementation of the "2nd Regional Hospital Improvement Project," from Table 1 one can see that replacement and new introduction of equipment at the facilities covered by the project led to improvement of the quality and expansion of medical services. However, although the situation regarding attainment of the overall goal of "reduction of the gap between the state of health of the inhabitants of the areas covered by the project and that of the inhabitants of other regions" was studied by comparison of the state of health of the inhabitants and the change in medical services of the areas where the facilities covered by the plan are located with those of other regions, no big difference was seen, and it was therefore not possible to specifically confirm the effect of the project.

The survey of the counterparts at the Ratnapura General Hospital based on interviews showed that the hospital staff had great expectations of the project, which enhanced their motivation. The hospital director's statement to the effect that although the hospital was presently an educational hospital for nurses, he wanted to turn it into an educational hospital for medical students after completion of the project shows the enthusiasm for expansion of activities.

Regarding the environmental impact of implementation of the "Ratnapura General Hospital Improvement Project," there has been considerable positive impact not only in environmental terms but also in terms of things like the health of the residents of the vicinity and prevention of nosocomial infection. The wastewater from that hospital had been discharged into a nearby waterway by way of a ditch running alongside the hospital buildings without having undergone any treatment at all. That posed the threat of nosocomial infection and constituted a hotbed of pathogenic bacteria and mosquito larvae in the area, but thanks to provision of a wastewater treatment facility in the project such risk and prejudice have been considerably mitigated. Furthermore, before there was a situation in which medical waste was in part collected by the municipality along with general garbage and in part burned in the open on the hospital grounds, but now all of it is disposed of in an incinerator installed in the hospital in the project.

(5) Sustainability

Although about 10 years have passed since the equipment procured in the "2nd Regional Hospital Improvement Project" was installed, most of it is still in use. The medical equipment installed in the project on the basis of Japanese grant aid and technical assistance is entirely managed by the Medical Equipment Service Center (BES), the contribution of that center to the present state of affairs being considerable.

However, since 10 years have already gone by, some of that equipment cannot be

repaired on account of difficulty procuring spare parts. Also sometimes equipment repairs have to be left unattended for quite some time because of inability to cope in an expeditious manner owing to the fact that the BES handles all of the medical equipment falling under the purview of the Sri Lankan Ministry of Health. What is therefore needed is setting up of a workshop at each facility that is capable of routine checking and inspection and simple repairs.

The Ministry of Health has a budget allocation for maintenance costs, but no provision has been made for increasing that budget for the consumables and maintenance expenses connected with the equipment procured in the project. That being the case, it is necessary to reconsider the Ministry of Health's budget allocation criteria.

Regarding the outlook for sustainability of the facilities of the "Ratnapura General Hospital Improvement Project," although the incinerator was handed over in March 2001, it was not being made proper use of because of failure to make sure that the medical staff thoroughly accomplished sorting and separation of waste. But in April 2002 in a seminar held in connection with handing over of other facilities an operational workshop was also held to administer repeat guidance for 45 staff members. Since then they have been carrying forward preparations for creating in-house organization for sorting and separation of waste. For the sake of achieving greater effectiveness through more appropriate utilization of facilities it is necessary that there be appropriate management efforts on the part of the hospital not only for the incinerator but also for all other facilities after they have been handed over.

(6) Other achievement

Not applicable.

(7) Summary

Since the eighties improvement of primary health care has been a cornerstone of the health and medical services policy of the Sri Lankan government, which identifies "widening of the scope of application and strengthening of the quality of medical services with emphasis on correction of the gap between different regions" as one of the major challenges faced, and both the "2nd Regional Hospital Improvement Project" and the "Ratnapura General Hospital Improvement Project" are perfectly in line with the country's development plans.

As a result of provision and subsequent effective utilization of the equipment provided in the project, the hospitals' medical services have been improved, including the fact that tests and examinations that previously were not possible now are, and it can therefore be concluded that the project objective of "improvement of the capacity of the hospitals

covered by the project to provide medical services" has been fairly well attained. However, although the situation regarding attainment of the overall goal of "reduction of the gap between the state of health of the inhabitants of the areas covered by the project and that of the inhabitants of other regions" was studied by comparison of the state of health of the inhabitants and the change in medical services of the areas where the facilities covered by the plan are located with those of other regions, no big difference was seen, and it is therefore not possible to specifically confirm the effect of the project.

3. Lesson Learnt

It is to be appreciated from the standpoint of sustainability of effect that the program was not started until after a medical equipment maintenance and management system was established through improvements in the BES. Moreover, for the sake of appropriate maintenance and management as well as sustainable utilization of equipment it is indispensable that there be selection of equipment for which procurement of spare parts is easy, securing of the services of local agencies capable of proper after-sales service and training of hospital staffs in operation and maintenance of the equipment. Judging from everything, including local observation and the findings of interviews, the Sri Lankan side has a great deal of confidence in and appreciation of the Japanese side's consideration of such matters.

In the 1990s for the sake of effective and ongoing use of facilities and equipment provided in grant aid Japan has provided assistance in terms of both medical technology and management and operation through combination of project-type technical assistance and individual sending of experts. At the same time emphasis on the operational side has been placed on medical equipment repair technology and management. The example of the incinerator for the Ratnapura General Hospital serving as a lesson, it will be necessary in the future to work for providing assistance for strengthening of facility operation and management, including basic hospital management.

4. Suggestion

Deficiencies in terms of necessary consumables and maintenance funds for the procured equipment have been a factor obstructing sustainable medical service activities. That being the case, it is important to reconsider the Ministry of Health's budget allocation criteria with a view to arranging budget provisions conducive to ability to have appropriate maintenance and management of procured equipment.

5. Annex

【PDM_E】

Summary	Indicators	Performances	External Conditions
Overall Goal Reducing the gap between the areas covered by the project and other areas in terms of the state of health of their inhabitants	Comparison of the mortality rate, the infant mortality rate and the newborn mortality rate of the areas covered by the project with those of other areas	No difference in gap with other areas that can be considered to be due to the project	Civil conflict
Program Objective Improving the medical services provision capacity of the areas covered by the project so as to reduce the gap between them and other areas in provision of medical services.	Number of referral patients accepted: Number of outpatients: Number of tests: Number of operations: Hospital bed occupancy rate: Comparison of the ratios of the above indices to population with other areas (other same-level hospitals):	Increase Increase Not known Not known Rise No difference in gap with other areas that can be considered to be due to the project.	
Project Objective Raising of the capacity of the hospitals covered by the project to provide medical services (same objective for both grant-aid equipment provision projects)	Number of referral patients accepted: Number of outpatients: Number of tests: Number of operations: Hospital bed occupancy rate:	Pronounced increase at 3 of the hospitals, increase at 2 of them Pronounced increase at 2 of the hospitals, increase at 3 of them Pronounced increase at 2 of the hospitals, increase at 3 of them Pronounced increase at 4 of the hospitals, increase at 1 of them Pronounced rise at 2 of the hospitals, rise at 2 of them and decline at 1 of them * * Due to increase in number of beds resulting from other assistance.	

Outputs 2nd Regional Hospital Improvement Project (grant aid) Rise in productivity Provision of new services	1. Improvement of the 5 hospitals covered by the project. 2-1 X-ray examination time per patient 2-2 Medical service time per patient 2-3 Waiting time per patient 2-4 Testing time per patient 3. Number of test items	1. The mentioned equipment was furnished. 2-1 No change at 2 of the 5 hospitals, decline at 2 others and sharp decline at the fifth. 2-2 Increase at 1 of the 5 hospitals and sharp decline at the other 4. 2-3 Sharp increase at 1 of the 5 hospitals, increase at another, no change at a third and decline at the other 2. 2-4 Sharp increase at 1 of the 5 hospitals, increase at another, no change at a third, decline at the other 2 and decline at 2 others. 3. Sharp increase at 2 of them, increase at 2 others and question not answered in the case of the fifth one.	Remaining on the job of counterparts who underwent technology transfer
Inputs 2nd Regional Hospital Improvement Project (grant aid) Ratnapura General Hospital Improvement Project (grant aid), presently in progress	Summary 1 596 million yen 2.1 1,393 million yen 2.2 359 million yen	1. Provision of medical equipment (for 5 hospitals) 2.1 Facilities 2.2 Provision of medical equipment	Smooth customs clearance of the provided equipment Civil conflict

* Since the Ratnapura General Hospital Improvement Project is still under way, we will have to wait till after it is completed to make an accurate assessment of what is achieved by it.