

Chapter 1

Background of the Project

Chapter 1 Background of the Project

1.1 Background

The Former Yugoslav Republic of Macedonia (hereinafter referred to as “the Recipient Country”) is an inland country with a national land area of some 26,000 km² and a population of approximately 2.01 million. It is situated on the Balkan Peninsular, surrounded by mountain ranges of approximately 2,500m above sea level and bordered by Albania, Bulgaria, Greece and new Yugoslavia (Kosovo and Serbia).

The country is facing a severe economic situation as the progress of the market economy has resulted in the collapse of domestic industries and a subsequent increase of the number of unemployed. Reflecting this difficult economic situation, the development of socioeconomic infrastructure has made slow progress with serious adverse impacts on the health and medical servicesector. Even though the national development plan upholds the improvement of health and medical services as an important policy objective, the insufficient budgetary appropriation is creating a problem of declining medical services quality.

The standard of medical care in Macedonia is relatively high and there is neither a qualitative nor quantitative problem of human resources in the medical servicesector. Despite this, virtually all medical facilities cannot conduct sufficient clinical examinations and treatment because of the scarcity of normal medical equipment in operation among the existing equipment as such equipment has hardly been renewed for some time because of the country’s dire economic situation. This situation can be commonly observed at 16 primary medical facilities or health centers which are the subjects of the Project.

Health centers, the subject medical facilities of the Project, exist in areas with a large local population or areas to which patient referrals are made by neighboring local administrative areas. As such, health center plays a core role in primary health care and provides its services and refers patients to upper medical facilities when necessary. The amendment of Health Insurance Law is deliberated to make the functions of health centers strengthen by separated from medical centers and to reduce the amount of the medical expenses. As in the case of other facilities, most health centers were established in the

1960's-1970's and hardly any medical equipment renewal or addition has since been conducted. This situation has led to equipment deterioration and failure to provide adequate medical services, forcing the health centers to refer patients to secondary or tertiary medical facilities for basic clinical diagnosis and treatment which should, in principle, be conducted by health centers. As upper medical facilities are busy with the diagnosis and treatment of referred patients, they cannot satisfactorily provide their own medical services. Meanwhile, when patients are referred to upper medical facilities located some distance away; they have to bear the cost of transportation. In addition, the traveling time may be considerable. As a result, there are many patients who fail to keep appointments at distant upper medical facilities even though they are aware of the need to do so.

Macedonia has placed requests the humanitarian aid to its public health sector from various organizations of other countries. However, substantial support given in the past has been limited to four projects of grant aid from Japan (“the Project for Upgrading the Medical Equipment” in 1995, “the Project for Equipment Supply for City Hospital-Surgical Clinic” in 1996, “the Project for Equipment Supply for the General Hospital of the Medical Center of Stip” in 1997 and “the Project for Equipment Supply for the General Hospital of the Medical Center of Bitola” in 1998).

Under these circumstances, the Government of Macedonia has made a request to the Government of Japan, which has provided grant aid four times in the past, for the replacement of obsolete equipment and the provision of additional new equipment for the purpose of improving the general standard of medical care through improvement of the standard of primary health care services and the establishment of a proper referral system to allow medical facilities at different levels to provide appropriate medical services.

1.2 Outline of the Project

- (1) Request : A request was filed in October 1998
- (2) Authority concerned : Ministry of Health,
Government of the Former Yugoslav Republic of Macedonia
- (3) Responsible Agency : 34 Health Centers
- (4) Contents : Procurement and installation of medical equipment to be provided to health centers. (Total number of 27 items)

Chapter 2

Contents of the Project

Chapter 2 Contents of the Project

2-1 Objectives of the Project

The purpose of the Project for Improvement of Medical Equipment for Primary Health Care Services is to improve the quality of health care services at health centers - the core medical facilities of primary health care services in the Former Yugoslav Republic of Macedonia - by upgrading the medical equipment and improving the diagnostic and treatment capabilities. This Project will also contribute to enhancing the functions and effectiveness of the referral system, the backbone of the health care system, through providing proper diagnosis and treatment to the patients, who are currently being referred to secondary and tertiary hospitals and be able to refer these patients to upper medical facilities only when necessary.

2-2 Basic Concept of the Project

2-2-1 Basic Concept

16 health centers affiliated with medical centers (secondary hospitals with the outpatient and inpatient facilities, hereinafter referred to as “affiliated health centers”) were selected for the Project. These 16 health centers are either located in the local government districts with a large population and/or attract high numbers of referrals from neighboring districts. If the equipment, which is necessary for primary health care services, will be replaced from existing obsolete equipment, this will contribute to recovering the capabilities and functions of diagnosis and to providing proper information such as imaging diagnosis, laboratory test and physiological test to the doctors and nurses working at health centers and health stations in the neighboring province.

The patients who are currently referred directly from health centers/health stations to medical centers/main regional hospitals and the patients who cannot afford to go to the upper medical facilities will be able to finish their examinations and treatments at near health centers located in major cities. As a result, health centers will play important roles to weed out unnecessary referrals to the upper medical facilities and to establish the framework of the referral system in combination with secondary and tertiary medical facilities that had been already supported with Japan’s Grant Aid.

2-2-2 Conclusion - Requested Equipment Investigation

The original request of the Project from the Ministry of Health of the Government of Macedonia amounted to 27 items of the equipment for 34 health centers.

Field Survey 1 was a preliminary study intended to gather information and materials to investigate the conditions of 34 health centers. The results of Field Survey 1 were examined to define the scope of the Project and to select the facilities. During Field Survey 2, the Study Team analyzed the propriety of the requested equipment of selected health centers and examined appropriate equipment and installation requirements in detail.

(1) Selection process of health centers

The health centers of original requests for the Project fall into two categories: health centers affiliated with medical centers in mid-sized cities of 100,000 residents or more and independent health centers (hereinafter referred to as “independent health centers”) in smaller towns with populations of 15,000 or more.

In Field Survey 1, the Study Team visited 34 health centers to investigate the role, functions, and purpose of each center, along with the current condition and use of existing equipment and the current status of the facilities. The results were analyzed in Japan and 16 affiliated health centers were selected according to, (i) the relations between the health centers and upper medical facilities - the secondary and tertiary hospitals already in receipt of Japan’s Grant Aid, (ii) the size of the population served by each health center and (iii) the regional distribution of the population. These 16 health centers are located in Bitola, Debar, Gevgelija, Gostivar, Kavadarci, Kicevo, Kocani, Kriva Palanka, Kumanovo, Ohrid, Prilep, Stip, Struga, Strumica, Tetovo and Veles.

(2) Equipment investigation

After Field Survey 1, the Study Team prepared the priority equipment list for each health center, based on the original equipment list and the necessary equipment in accordance with the current functions of health centers in the light of the results of Field Survey 1. After returning to Japan, the Study Team also evaluated the equipment lists in consideration of the expected separation of medical centers and health centers under amendments to Health Insurance Law designed to clearly distinguish between primary and secondary health care.

In Field Survey 2, the Study Team visited the Ministry of Health and explained the procedures and results of the selection of 16 affiliated health centers and visited all 16

centers to investigate the current conditions of equipment and facilities. The compositions and specifications of the requested equipment were confirmed with the relevant directors and doctors of health centers to decide a priority of the equipment. These discussions were held from the point of view of avoiding equipment duplication, ensuring effective use of equipment and maximizing the limited funds.

The equipment such as X-ray apparatus and laboratory equipment were considered on the basis of the role of the affiliated health centers. In cases where a medical center and health center shared X-ray apparatus and/or laboratory equipment, the equipment plan was made according to the condition of existing equipment and facilities, patient numbers and parameters for tests on the premise of the separation of the medical centers and health centers in the near future.

2-3 Basic Design

2-3-1 Design Concept

(1) Policy concerning external climatic conditions

Macedonia has a Mediterranean climate in the east and central (Baldal river basin) regions and a continental climate in the north and south. The country thus has significant differences in temperature, although these differences are not expected to affect the normal operation of equipment supplied under this Project. Accordingly, additional measures with regard to climatic conditions are considered unnecessary. Macedonia is a mountainous country and the narrow mountain roads are often winding and steep. Road conditions are dangerous during winter, due primarily to freezing of the road surface. Trucks and other vehicles frequently slip on the roads and are often stranded. For these reasons, inland transportation of equipment to health centers located in mountainous regions should be completed before December, when snowfall begins to accumulate.

(2) Policy concerning equipment planning

1) Basic policy for medical equipment

The quality and specifications of the equipment will essentially be equalized with the existing equipment at health centers. In case of the equipment with a higher efficiency and performance rather than the existing equipment or the first equipment to be procured, these items will be evaluated regarding, (i) the roles and functions, (ii) the necessity of providing the expected medical services, (iii) the technical level of medical staff and (iv) the easiness of the operation and maintenance.

2) Basic policy for supply of spare parts and consumables

Variety and quantity of spare parts and consumables will be supplied under the Project to ensure proper operation and to maximize equipment performance after the installation. However, these spare parts and consumables will be provided only at the initial stage, so subsequent parts will be supplied on own responsibility of Macedonia.

(3) Policy concerning operational, maintainable, and managerial capability

Because health centers are the medical facilities to provide the primary health care services, the equipment procured under this Project will be aimed at the basic diagnosis and treatment. Since there are a large number of skilled medical workers, including doctors, nurses and technicians, the operational training in the time of the equipment delivery will be sufficient to operate the procured equipment.

Each medical center has certain numbers of staff experienced in maintenance and they provide maintenance services with the medical equipment of both medical center and health center. Moreover, the local agents of manufactures have enough abilities to take care of the equipment that requires quick response to the maintenance services and the reagents' supplies. Because the grade of the procured equipment of the Project will be same as that of the existed equipment, the maintenance staff and local agents will be able to provide the maintenance services including daily maintenance.

(4) Policy concerning procurement from third-party countries

16 health centers selected for the Project are scattered throughout Macedonia. This may lead to delays in obtaining spare parts and consumables, as well as difficulty in obtaining maintenance and repair services from the relevant manufacturers. Where the equipment requires a regular maintenance or parts replacement, it is important to choose a manufacturer with a local agency in Macedonia or in a neighboring country. Japanese products are relatively uncommon, so it may be prudent to procure some equipment from third-party countries in order to facilitate proper maintenance and supply of spare parts and consumables. If the equipment satisfies quality and performance standards for health centers, the equipment will be procured from either Japan or third-party countries.

(5) Policy concerning inland transportation

The best possible route of the inland transportation will be from the port of Thessaloniki in Greece to 16 health centers via Skopje. The equipment will be unloaded

at the port of Thessaloniki and transported to the warehouse in Skopje by truck. Since the project sites are scattered throughout the country, several equipment will be sorted into containers for each destination and transported them in keeping with the installation schedule of each health center.

Main roads in Macedonia are in relatively good condition, but the country is mountainous. In case that equipment is delivered during winter, contingency plans need to be drawn up to deal with potentially poor road conditions.

Therefore, the route from the port of Thessaloniki to health centers via Skopje will be the most favorable. However, the diplomatic relations between Greece and Macedonia are not yet entirely normalized and the potential risk of renewed tensions could conceivably result in a border closure. It will therefore be necessary to monitor international developments closely. In case that the equipment has to be transported to Macedonia by air, Skopje International Airport will be used to services air transportation.

(6) Policy for the period of the execution of the Project

The period of time allotted to the Project is one fiscal year. However, the timing of procurement, delivery and installation of the equipment should be carefully examined to prevent delays, including procurement from third-party countries. Given the large number of health centers and the long distances involved, the timing of installation is most important factor. In order to ensure that equipment be installed quickly and efficiently, the effective arrangement will be considered.

2-3-2 Basic Design

(1) Total concept of the project planning

31 items of medical equipment have been identified as necessary apparatus for the provision of primary health care services to the local population by health centers. The equipment including: X-ray apparatus, laboratory apparatus, apparatus for emergency, apparatus for gynecology, apparatus for dental treatment, physiological test apparatus and other apparatus for central supply will be procured on the basis of the role of each health center.

As the most equipment will be procured to replace the existing obsolete equipment, the problems associated with installation space are not anticipated. However, both general X-ray apparatus and fluoroscopy will require minor room modifications, such as the installation of shielding and wiring, and construction of the dressing room for patients.

In discussions with doctors, it was confirmed that the necessary modifications and equipment installation could be undertaken without disruption to the ongoing provision of health care services. The withdrawal of existing apparatus will be conducted on health centers' own responsibilities.

The plan should provide for careful consideration of management, maintenance, inspection and repair of equipment after delivery. It is also necessary to calculate the required supply of spare parts and consumables by estimating the frequency of use of each item, so that these figures may be reflected in the plan, which is intended to prevent the expiration of effective dates and dead stocks. The plan should also provide for a continuous supply system for procuring technical services and spare parts and consumables.

(2) Equipment plan

Table 2-1 shows the equipment to be provided under the Project. For each type of equipment, the basic specifications were assessed as described below.

Each number of the equipment was decided to a minimum in accordance with the roles of health centers which are affiliated with medical centers. However, if a high necessity and a great demand of the equipment are recognized, these equipment will be procured more than one item.

Table 2-1 Equipment List of the Project

No.	Equipment	Q'ty
1	General X-ray apparatus	12
2	Fluoroscopy	8
3	X-ray apparatus (General & Fluoroscopy)	1
4	X-ray protection apron	21
5	X-ray film processor	12
6	X-ray film illuminator	16
7	Ultrasound apparatus for general practice	16
8	Ultrasound apparatus for GY	16
9	Spectrophotometer	15
10	Blood cell counter	12
11	Microscope	32
12	Centrifuge	12
13	Medical refrigerator	16
14	Distillater	16
15	ECG apparatus	39
16	Spirometer	15
17	Ambulance vehicle	10
18	Stretcher	16
19	Defibrillator	14
20	Laryngoscope	16
21	Aspirator	16
22	Instrument set for minor surgery	32
23	Examination light	32
24	Examination table for GY	16
25	Basic instrument set for GY	16
26	Colposcope	14
27	Dental unit	16
28	Dental X-ray apparatus	11
29	Sterilizer (small size)	32
30	Sterilizer (medium size)	32
31	Instrument cabinet	48

1) X-ray apparatus

The image diagnosis is a key role of the medical services at health centers. Also, the equipment for image diagnosis has been rated a high priority for the procurement.

Two types of X-ray apparatus, general X-ray apparatus for diagnosis of bone fractures, tuberculosis and pneumonia, and fluoroscopy for observation of ailments such as digestive tract inflammation and ulcers, will be supplied. For effective utilization, each apparatus would ideally be installed in its own room. In case that

health center has only one room with the X-ray protection, but has been rated as a high priority for the procurement of both apparatus, such as Debar Health Center, a combined system with one generator and two tubes will be installed.

In the light of factors such as the current mode of operation, the composition of existing equipment and space limitations, it has been decided to employ the near-field imaging format on fluoroscopy, whereby the operator stands quite close to the patient and adjusts his/her position while checking the fluoroscopic image on a video monitor prior to the actual fluoroscopy and imaging.

X-ray films are still developed manually at several health centers, while most automatic film processors at other centers are obsolete and prone to out of order. Since the equipment procured under the Project will increase the demand for film development and health centers conduct frequent medical examinations, a processing time of 180 seconds per image is considered appropriate.

Ultrasound apparatus is used extensively to obtain images of internal organs without radiation exposure. In view of the roles of health centers, ultrasound units will be general-purpose units capable of B/M mode diagnostic imaging; they should accommodate convex and linear probes (for general practice) and convex and vaginal probes (for gynecology).

2) Laboratory apparatus

Basic analyses of urine and blood samples for anemia, contagious disease, diabetes, liver and kidney problems, and gastrointestinal disorders are one of the most important functions of health centers. Although all health centers have medical technologists for clinical tests in the laboratory, the lack of proper equipment has affected the reliability of test results. Therefore, new equipment is urgently needed.

Manual type of spectrophotometer will be suitable for health centers in the light of the grade of existing equipment and the demand for testing. As spectrophotometer analyzes the biological functions with spectral analysis by using a small volume of reagents, but frequent, the open system will be necessary to economize the operation costs and to keep reagents supplied.

About four years ago, the Ministry of Health provided blood cell counters from the same manufacturer to several health centers and medical centers. To avoid duplication, this has been taken into account when selecting health centers for the procurement of blood cell counter. The apparatus should have same specifications

(18 parameters) to maximize compatibility among health centers across the country.

All health centers are equipped with microscopes, but most are over 15 years obsolete and are either unusable or partially disabled due to age, or do not operate properly due to missing parts. Standard grade microscopes with 40-1,000x magnifications should be adequate for current testing procedures.

3) Physiological test apparatus

Most health centers are equipped with an ECG apparatus, however, these are now very obsolete and prone to breakdowns, which creates a major impediment to testing. ECG is generally used for the department of general practice and labor medicine. All health centers requested multi-channel systems that can be used on patients in multiple departments, rather than the simpler portable systems. Regarding that the medical examinations will be executed at health centers, the multi-channel systems are suitable.

Spirometer is the important equipment in health centers, but the doctors have difficulties in testing with obsolete equipment. In view of the roles and functions of health centers, the model should be capable of measuring lung aeration and maximum ventilation, important components of lung performance screening tests.

4) Apparatus for Emergency

Apparatus for emergency such as defibrillators, instruments for minor surgery and ambulance vehicles will be procured according to the activities of emergency department.

Since ambulance vehicles are used mainly to transport patients between medical facilities, the standard roof and long body type vehicle with diesel engine is suitable to be procured, which is less costly to operate and maintain. Ambulance vehicles should be equipped with stretchers, oxygen cylinder holder and intravenous hook. These vehicles must be easy to be maintained and repaired in the event of breakdowns. Therefore, vehicles should be procured from a manufacturer that has branches and a service system in Macedonia.

Instruments set for minor surgery is used in basic surgical procedures. Nearly all health centers already have minor surgery instruments, but they are obsolete and often incomplete, worn or in short supply. These instruments will be basic components and be procured on the basis of a minimum requirement with the

consideration of the functions of emergency department.

5) Apparatus for Gynecology

Gynecology department represents an important function of health centers. Basic equipment such as examination table, colposcope, basic instrument set for gynecology and examination light are very obsolete and in urgent need of replacement. The equipment to be procured will have the same specifications as existing equipment.

6) Apparatus for central supply

Sterilizer is one of the most important and basic equipment in any medical facilities. Health centers in Macedonia do not have central sterilizing systems. Instead, each department in health centers has tabletop hot air sterilizers, ranging in size from small (capacity approximately 90 liters) to medium (150 liters). All of these units have been used since the former Yugoslavia era.

During the Field Survey, the Study Team discussed with doctors of health centers to concern more efficient sterilization systems for health centers. They reached the agreement that the central sterilization system would not be appropriate, due to the nature of the facilities and the way in which facilities are operated. As a more realistic means of providing much-needed sterilization equipment, it was decided to divide each health center into four units with 90 liters and 150 liter hot air sterilizers provided in each, thus creating a form of a small-scale central sterilizing system for each unit.

(3) Modifications required for installation

Most X-ray apparatus will be replaced with the existing equipment, so the space for the installation of the equipment would not be a problem. But some X-ray rooms require the additional work for minor modifications, such as the installation and/or replacement of shielding walls, lead glass and lead doors.

During the Field Survey, the Study Team considered the necessary work prior to the equipment installation and its schedule in detail and confirmed that the expenses would be borne by the Ministry of Health and each health center. All health centers have staff capable of carrying out modification work such as removing existing equipment, demolishing walls for installation works, and so forth. Since the assistance from outside is not necessary, the cost of this work for the health centers should be negligible.

Chapter 3

Implementation Plan

Chapter 3 Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Concept

The Project will be carried out after the signing of the Exchange of Notes (hereinafter referred to as “E/N”) by the government of Japan and the government of the Recipient Country concerned in accordance with Japan’s Grant Aid Scheme.

After the Notes are exchanged, the entire scope of the Project, from design, installation and inspection to procurement, should be completed smoothly and promptly. Therefore, plans involving work and personnel should be formulated so that each stage of the Project can be executed efficiently and effectively.

To ensure smooth execution of the Project, meeting and discussion about project’s details should be arranged for representatives from the relevant organizations of the government of Macedonia (e.g. the Ministry of Health and Ministry of Foreign Affairs) and from health centers to meet with staff from a Japanese consulting firm and supplier of the equipment, so as to discuss plans and other details.

After the project is approved by the governments of both countries involved and the E/N is concluded, a Japanese consulting firm that is currently under contract with the Macedonian Government will supervise the project’s execution as well as actual procurement of the equipment. Also, a supplier of the equipment will be determined on the basis of open tender as specified in the E/N, and this supplier will be responsible for procurement and installation of the equipment.

(1) Party responsible for the implementation of the Project

The responsible party in the Recipient Country is the Ministry of Health. The Ministry of Health will act as the contracting party of the Recipient Country, and shall be responsible for implementing the Project. The Ministry of Health is required to cooperate in regard to the appointment of the responsible persons concerned for the health centers and work necessary for unpacking, delivery and assembly/trial run of the equipment.

The Ministry of Foreign Affairs and the Ministry of Health shall be responsible for customs clearance, internal transportation, and so forth.

(2) Consultant

Following the signing of the E/N between two governments concerned, the Ministry of Health shall sign a consultant agreement with a Japanese national consulting firm for the detailed design of the equipment to be procured. The work will also be associated with supervision of project implementation and equipment procurement. The agreement will be verified by the Japanese Government. The consultant shall be responsible for implementation of the following work under the agreement:

1) Detailed design phase

The final confirmation of the Project, reviewing the equipment specifications, preparation of tender documents, supervision of tender procedure and evaluation of the contents of the tender

2) Implementation phase

Supervision of project implementation including control of the work schedule, inspections of equipment, supervision of transportation, supervision of installation work and issuance of certificates

(3) Suppliers of the equipment

Based on the E/N and in accordance with the “Guidelines for Procurement” under Japan’s Grant Aid Scheme, the Ministry of Health shall sign a procurement agreement with Japanese national suppliers that shall be determined on the basis of open tenders on the equipment to be provided. The agreement shall be verified subject to the approval of the Japanese Government. The suppliers shall implement the following tasks under the agreement:

- Procurement, transport and delivery of the equipment
- Installation of the equipment, and technical guidance concerning operation, maintenance and repair

3-1-2 Implementation Conditions

All possible measures shall be taken to ensure the implementation and a complete procedure for installation is required that will ensure the quick and efficient completion of

the procurement, transport, delivery and installation of the equipment. As the project sites are located in 16 rural cities of Macedonia, plans for transport and installation of the equipment and materials shall be carefully drafted. Therefore, consultations with officials concerned are essential prior to customs clearance, inland transportation, and removal of old equipment, storage area for the procured equipment, route for carrying them in, etc.

3-1-3 Scope of Work

The work provided for the Project by the Recipient Country and covered by Japan's Grant Aid will be described below.

1) Work to be carried out by the Recipient Country

- Removal of existing equipment
- Connection of utilities at the designated points for the equipment to be procured
- Preparation of storage area for the equipment to be procured until the time of installation
- Preparation of the route for carrying the equipment to the room from the storage area
- Modification of the room (X-ray)

2) Work to be covered by Japan's Grant Aid

- Procurement of the new equipment
- Transport of the equipment to be procured
- Delivery, installation, and trial run of the equipment to be procured
- Technical transfer on operation and maintenance of the equipment to be procured

3-1-4 Consultant Supervision

A Japanese national consulting corporation shall provide fair guidance, advice and coordination throughout the detailed design phase and implementation phase of the Project. Furthermore, this consulting firm shall do whatever is necessary in order to ensure the smooth implementation of the Project in accordance with the Japan's Grant Aid Scheme and the Basic Design Study Report. The consultant will be deemed to have completed its work when the equipment is completely installed, it is confirmed that all conditions of the contract have been met, the official delivery of the equipment is witnessed and the approval of the Recipient Country is obtained.

(1) Framework of Implementation Supervision

- 1) Arrangement of the completion dates for installation, maintaining close contact among all parties concerned
- 2) Supervision of installation work
- 3) Suggestions for maintenance after the official delivery of equipment

(2) Personnel Plan

The consultants required for the supervision of detailed design and implementation shall be as follows:

- 1) Project Manager One (1)

This project manager shall be responsible for the comprehensive supervision of work.

- 2) Equipment Planner 1 One (1)

This person shall be responsible for the confirmation of the equipment specification, for the preparation of tender documents and evaluation of the contents of the tender and for the supervision of the installation of the equipment at health centers.

- 3) Equipment Planner 2 One (1)

This person shall be responsible for the re-examination of the Project and the confirmation of the equipment specification and for the supervision of the installation of the equipment at health centers.

3-1-5 Procurement Plan

(1) Procurement of the equipment

Most of the equipment will be procured within Japan, but certain items that will require regular maintenance, frequent procurement of spare parts and consumables, or those that come with doctors' convenience such as operating instruments, may be acquired from third-party countries. Also, following the official delivery of the equipment, the Ministry of Health shall be promptly provided with technical services spare parts and consumables at a reasonable price. The procurement plan for the equipment shall be drafted so as to favor either manufacturer that have agents capable of providing technical services (repair and maintenance services) in the Recipient Country or in neighboring

countries, or those that have a sufficient stockpile of spare parts and consumables.

(2) Inland transportation route

The route of the inland transportation will be from the port of Thessaloniki in Greece (the closest port with the best roads) to 16 health centers via Skopje. In case the equipment is transported by air, Skopje International Airport will be available.

As most equipment consists of precision instruments and requires measures to prevent damages from the shocks and moisture, special packing methods will be designed to accommodate long-distance transportation.

(3) Plan of the dispatch of engineer

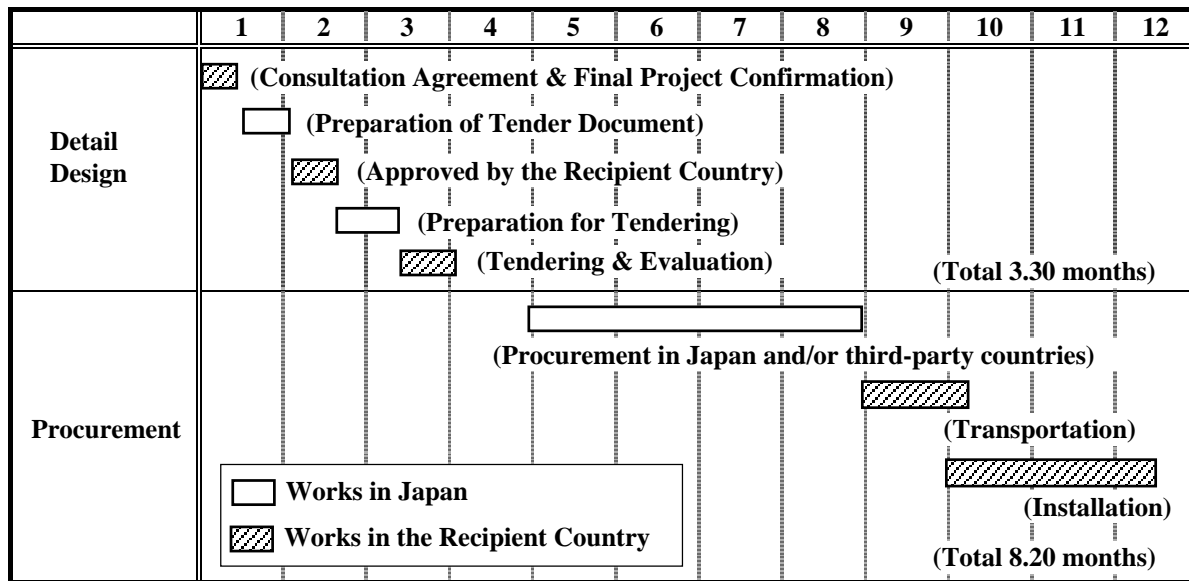
Personnel, including laborers required for the installation of equipment, shall be secured in the vicinity of health centers, in principle, while engineers shall be dispatched from Japan and other countries to supply equipment requiring special skills and techniques. Laborers shall install the equipment under the guidance and supervision by the engineers at each project site. The procedure for test runs and adjustment of the equipment will be planned to allow enough time for technical transfer to the doctors and engineers concerned at health centers.

3-1-6 Implementation Schedule

When the time arrives for the Project to be carried out, the consulting firm will investigate the specifications of the equipment. Then, the supplier of the equipment, who will be decided through open tender, will procure the equipment.

The Project implementation schedule is given in **Table 3-1**.

Table 3-1 Project Implementation Schedule



3-1-7 Obligations of the Recipient Country

The Recipient Country shall perform the following in accordance with the Exchange of Notes (E/N), for the smooth implementation of the Project.

- 1) To exempt customs duties, internal taxes, and other fiscal levies that may be imposed in the Recipient Country with respect to the supply of the equipment and the provision of services under the verified contracts;
- 2) to ensure both prompt customs clearance in the Recipient Country and a procedure for internal transportation therein of the medical equipment brought from Japan and third-party countries;
- 3) to provide Japanese nationals and third-party country engineers working on the Project with every convenience to facilitate their entry into the Recipient Country and their stay therein;
- 4) to ensure the issuance of permits required by the laws of the Recipient Country for the implementation of the Project, and other permits, including tax exemptions;
- 5) to ensure that the equipment procured under the Grant Aid Scheme is maintained and used properly and effectively for the Project; and
- 6) to confirm that the Recipient Country bears all expenses except for those agreed to be covered by the Japanese government.

3-2 Project Cost Estimation

3-2-1 Condition of Cost Estimation

Estimated as of	: October 2000
Exchange rate	: US\$1.00=107.58 YEN DM1.00=50.57 YEN EURO1.00=98.91 YEN
Implementation Schedule	: Refer to Table 3-1
Other	: The Project shall be implemented in accordance with Japan's Grant Aid Scheme.

3-2-2 Expense Borne by the Recipient Country

The Project is intended primarily to replace obsolete equipment, the installation site is nearly prepared, and basic conditions for the installation of utilities have been met. The expenses for the work performed by the Recipient Country amounts to be approximately 75,300 Deutsche Mark (DM).

3-2-3 Operation and Maintenance Plan

Each health center has a sufficient number of doctors, engineers and nurses having the technical expertise necessary to operate the equipment to be procured. Furthermore, the dedicated staffs of the administrative and accounting departments, which are managed separately from the medical departments, are making every effort to ensure the appropriate management.

The costs of operation and maintenance, including spare parts and consumables, are expected to increase with the introduction of the new equipment. **Table 3-2** summarizes the provisional estimation of the total management costs of main items. The estimation period is for eight years from 2002 to 2009; the operating ratio is 50% for 2002, 70% for 2003, 90% for 2004, and 100% for 2005 and thereafter. The annual management costs fluctuate because of the irregular maintenance services and replacement of the equipment parts (every five years).

Table 3-2 Operation and Maintenance Cost

(Bitola) (thousand Denar)

Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	351	351	351	351	351	351	351
Spare parts	0	1,765	2,269	2,521	2,521	3,106	2,521	2,521
Total	0	2,115	2,620	2,872	2,872	3,456	2,872	2,872

(Debar) (thousand Denar)

Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,438	1,849	2,054	2,054	3,516	2,054	2,054
Total	0	2,140	2,550	2,756	2,756	4,218	2,756	2,756

(Gevgelija) (thousand Denar)

Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,928	2,478	2,754	2,754	4,216	2,754	2,754
Total	0	2,629	3,180	3,456	3,456	4,918	3,456	3,456

(Gostivar) (thousand Denar)

Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	351	351	351	351	351	351	351
Spare parts	0	1,194	1,535	1,705	1,705	2,290	1,705	1,705
Total	0	1,545	1,886	2,056	2,056	2,641	2,056	2,056

(Kavadarci) (thousand Denar)

Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,928	2,478	2,754	2,754	4,216	2,754	2,754
Total	0	2,629	3,180	3,456	3,456	4,918	3,456	3,456

(Kicevo) (thousand Denar)

Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,454	1,869	2,077	2,077	3,539	2,077	2,077
Total	0	2,155	2,571	2,778	2,778	4,240	2,778	2,778

(Kocani) (thousand Denar)

Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,928	2,478	2,754	2,754	4,216	2,754	2,754
Total	0	2,629	3,180	3,456	3,456	4,918	3,456	3,456

(Kriva Palanka) (thousand Denar)

Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,454	1,869	2,077	2,077	3,539	2,077	2,077
Total	0	2,155	2,571	2,778	2,778	4,240	2,778	2,778

(Kumanovo)		(thousand Denar)						
Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,928	2,478	2,754	2,754	4,216	2,754	2,754
Total	0	2,629	3,180	3,456	3,456	4,918	3,456	3,456

(Ohrid)		(thousand Denar)						
Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	351	351	351	351	351	351	351
Spare parts	0	1,765	2,269	2,521	2,521	3,106	2,521	2,521
Total	0	2,115	2,620	2,872	2,872	3,456	2,872	2,872

(Prilep)		(thousand Denar)						
Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,912	2,458	2,731	2,731	4,193	2,731	2,731
Total	0	2,614	3,160	3,433	3,433	4,895	3,433	3,433

(Stip)		(thousand Denar)						
Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	0	0	0	0	0	0	0
Spare parts	0	1,191	1,531	1,701	1,701	1,701	1,701	1,701
Total	0	1,191	1,531	1,701	1,701	1,701	1,701	1,701

(Struga)		(thousand Denar)						
Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	0	0	0	0	0	0	0
Spare parts	0	717	922	1,024	1,024	1,024	1,024	1,024
Total	0	717	922	1,024	1,024	1,024	1,024	1,024

(Strumica)		(thousand Denar)						
Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	351	351	351	351	351	351	351
Spare parts	0	1,765	2,269	2,521	2,521	3,106	2,521	2,521
Total	0	2,115	2,620	2,872	2,872	3,456	2,872	2,872

(Tetovo)		(thousand Denar)						
Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	0	0	0	0	0	0	0
Spare parts	0	1,191	1,531	1,701	1,701	1,701	1,701	1,701
Total	0	1,191	1,531	1,701	1,701	1,701	1,701	1,701

(Veles)		(thousand Denar)						
Year	2002	2003	2004	2005	2006	2007	2008	2009
Maintenance cost	0	702	702	702	702	702	702	702
Spare parts	0	1,928	2,478	2,754	2,754	4,216	2,754	2,754
Total	0	2,629	3,180	3,456	3,456	4,918	3,456	3,456

Provisional calculations indicate that the management cost can be comfortably covered by the income expected after the installation of new equipment. However, this all depends on the efforts of health centers. It is therefore necessary to ensure

maintenance and supply systems by taking account of the geographical conditions of all centers. The improvement of capabilities and stable management will strengthen the financial self-reliance of health centers. The introduction of principle of depreciation will be crucial for sustainable development of health centers

Chapter 4

Project Evaluation and Recommendation

Chapter 4 Project Evaluation and Recommendation

4-1 Project Effect

Based on the results of the Basic Design Study, the following effects are expected from the realization of the Project.

(1) Direct Effect

1) Improvement of primary health care service through enhancement of diagnosis and treatment capabilities at health centers

The provision of new medical equipment (mainly diagnostic equipment) at 16 health centers which act as key bases for primary medical service in local administrative areas will enhance the diagnosis function, which has declined due to the deterioration of the existing equipment, and will also enable the provision of information necessary for appropriate treatment from image diagnosis, laboratory test and physiological function test to doctors, nurses and other medical workers at health centers and at health stations in the Project Area (local administrative areas) which are subordinate medical facilities to the health centers.

2) Reduction of physical and financial burdens on people live in local area

People living in local administrative areas have found it necessary to travel to distant upper medical facilities for basic medical examinations and treatment due to the inadequate functioning of health centers in their own areas, thus experiencing both physical and financial burdens. There are cases where people cannot travel to upper medical facilities because of economic reasons, failing to enjoy proper access to adequate medical services so far. When basic medical examinations and treatment are made available at health center in one's own or neighboring administrative area with the implementation of the Project, the physical and financial burdens on patients will be greatly reduced. As the accessibility to medical services in each area will be improved, whole Macedonia will benefit from the Project.

3) Strengthening of referral system in Macedonia

With the restoration of the functions (mainly the diagnostic function) of health

centers under the Project, many of those patients who are currently referred by health centers or health stations to medical centers or main regional hospitals will be able to complete the medical examination and treatment process at health center. In other words, together with the improvement of secondary and tertiary medical facilities under past Japanese aid, the framework of the referral system will be completed, allowing medical facilities at each level to provide appropriate as well as efficient medical services to deal with the level of illness and also to function as a “filter” for the referral of patients to upper medical facilities.

(2) Indirect Effects

On the revision of the Health Insurance Law that is currently being deliberated by the Ministry of Health materializes, health centers will become independent entities from the co-existing medical centers in terms of finance (introduction of a self-supporting accounting system) and human resources (appointment of own doctors, nurses and others). The improvement of medical equipment under the Project will stimulate the medical activities of health centers that have so far been largely dependent on medical centers. The resulting increase of the income of health centers should assist their smooth separation from medical centers in terms of both finance and human resources and should contribute to the stable management of the separated health centers in the future.

4.2 Technical Cooperation and Collaboration with Other Donors

Most of the medical equipment to be procured under the Project will be the equipment which is replaced for existing obsolete equipment and the equipment necessary for basic diagnosis under primary health care activity. Given the high level of medical skills of medical workers in Macedonia, it can be reasonably anticipated that sufficient operation training will be conducted after the handing over of the equipment to ensure the proper operation. Nevertheless, in view of the facts that the technological development of medical equipment is an ongoing process and that the constant upgrading of skills is required, the provision of technical cooperation, for example involving the acceptance of Macedonian doctors as trainees in Japan and the dispatch of experts to Macedonia, is highly desirable to ensure the further improvement of local skills in addition to the sufficient transfer of skills at the time of equipment installation so that the procured equipment on the Project is effectively used. As it is planned to clearly separate primary

and secondary medical facilities in the future, consideration of the provision of technical cooperation is necessary to enhance the ability to manage the medical facilities in addition to technical cooperation regarding medical skills and technologies.

Such international organizations as the World Bank and UNICEF are actively operating in Macedonia and are examining the possibility of extending cooperation for the consolidation of primary health care and a qualitative improvement of mother and child medical care. It is desirable that these international organizations, the Government of Japan and the Government of Macedonia actively continue to exchange information to avoid any unnecessary duplication of aid projects and to ensure effective aid. The present Project is mutually complementary to the World Bank project to improve the basic medical equipment at health stations that comprise the foundation for primary health care. It is hoped that the synergic effects of these two projects will improve the diagnosis function of primary health care as well as contributing to a functional improvement of the entire health and medical services in Macedonia.

4.3 Recommendations

(1) Implementation of Policies of Separation Corresponding with the Changes of Refers of Patients

The procurement of the necessary and basic medical equipment at affiliated health centers will contribute to improve the level of primary health care services, which will enable these centers to examine and treat the patients with slightly sick/injured, who used to be referred to medical centers. Because these patients will be referred from health stations and/or independent health centers to affiliated health centers, the flows of the patients within the referral system will be changed. These changes will make a clear distinction between primary and secondary health care services and it is expected that the medical facilities will be able to provide the proper medical services at each level.

The revision of the Health Insurance Law by the Ministry of Health aims at a shift of the health and medical care policies to emphasize primary health care and it is likely that the health centers responsible for primary health care will be separated from the medical centers responsible for secondary medical care in the near future. The efficient implementation of the policies of separation is required to restructure the referral system following the changes of flows of referred patients in keeping with the quality and quantity of medical services.

(2) Improvement of diagnosis system at health centers

The introduction of new equipment under the Project will improve the diagnostic capability of each health center. The new availability of X-ray apparatus and ultrasound apparatus should result in a qualitative improvement and quantitative increase of the diagnosis of illness that is currently difficult to achieve. It is expected that the role of health centers will progress from that of acting as a “reception desk” for the referral of patients to upper medical facilities to acting as a “filter” to judge whether or not referral to an upper medical facility is necessary. As health centers currently have personnel with excellent skills, operation training at the handing over of the equipment should be sufficient to ensure the proper operation of the new equipment. Nevertheless, further improvement of the skill level will be required through the expansion and redevelopment of human resources and training of medical workers in collaboration with upper medical facilities will be required to deal with the future demand for primary health care and to establish an effective as well as efficient diagnosis and treatment system.

(3) Development of maintenance system

The maintenance cost is one factor to pressure the financial situation of each health center. The geographical location of the subject health centers in local cities in Macedonia means that the equipment suppliers may find it difficult to provide an prompt response to an equipment breakdown, possibly resulting in the suspension of medical services.

In view of such an eventuality, it will be necessary to train and deploy maintenance personnel capable of conducting the maintenance and minor repair of the medical equipment at each health center for the purposes of reducing the maintenance cost of the equipment, providing a quick response to equipment breakdowns and ensuring the effective as well as continual maintenance of the equipment. In addition, the preparation and management of regular inspection and repair records, which are not conducted, will be required for effective maintenance.

Such maintenance personnel must have a proper understanding of the contents of the guarantees provided by the manufacturers as the repair of equipment by those other than the manufacturers’ engineers may nullify the original product guarantee. Essentially, as it will be difficult for the maintenance personnel at health centers to repair the image diagnosis equipment, it will be necessary to conclude a maintenance agreement with each

manufacturer with the inclusion of the said cost in the operation and management plan.

(4) Review of facility management system (Financial and Funding Plans)

The subject health centers of the Project are currently managed by medical centers and, in the future, these health centers will be required to manage their own facilities independently. Even today, however, there is a situation where the efficiency of facility management is not taken into proper consideration in management practices. As self-reliant facility management without dependence on the already stringent government finance will eventually be required while presupposing the provision of high quality health and medical services in the future, it will be necessary for each health center to try to establish its own stable management. In the meantime, government guidance for both the financial and funding plans will be required until health center management is on the right track.

The implementation of the Project is expected to invigorate medical services due to the positive effects of the introduction of new equipment. The expected income from the use of the new equipment should be sufficient to cover the operation and maintenance cost while a self-supporting accounting system is believed to be feasible by means of saving some of such income. Such saving will be a key factor in the establishment of a system under which each facility can continually manage its own operating funds based on a self-supporting accounting system.

(5) Adoption of principle of depreciation

In order to ensure the sustainable development of each health center, adoption of the principle of depreciation will be essential to establish a system under which equipment can be regularly renewed. Under the Project, the funds required for initial investment (equipment procurement cost) by each health center will be provided by Japanese grant aid. In case that each health center makes the best of this opportunity by adopting the practice of equipment depreciation and regular saving in accordance with a relevant plan, the required funds for reinvestment will be available in 5-8 years time when the newly acquired medical equipment is in need of renewal. The establishment of this cycle, from the procurement of new equipment to equipment renewal, will certainly contribute to the sustainable development of the subject primary health facilities of the Project.

For the purpose of making the increased income resulting from the newly installed equipment directly contribute to the accumulation of reinvestment funds, the Ministry of

Health should provide guidance on the establishment of a system which will enable each health center to reinvest in new equipment without relying on external funding by means of including “a depreciation fund” in the Health Insurance Fund to forcibly make each health center save part of its income to cover the depreciation cost.

(6) Management stability of Health Insurance Fund

As the income of each medical facility is mainly in the form of transfer from the Health Insurance Fund, it is essential for this transfer to take place without fail for the stable management of all medical facilities. However, the balance of the Health Insurance Fund is currently quite tight. The money transferred from this Fund is mainly used to pay the personnel cost, lighting and heating cost and other essential costs to run the facilities and consumables (X-ray films, etc.). The available money at each medical facility is, therefore, not entirely sufficient to meet other expenses.

What is a crucial requirement to stabilize the management of medical facilities at present is the establishment of the sound financial condition of the Health Insurance Fund, which is currently suffering from a chronic deficit. The Ministry of Health has, in fact, recently revised the Health Insurance Fund Law in order to improve the management condition of the Fund. This revision intends, among others, (i) to stabilize the income by means of reviewing insurance premiums and medical diagnosis and treatment fees and (ii) to reduce the expenses of medical activities to a reasonable level. It is important that these targets be met through the thorough implementation of the relevant measures envisaged by the revised Health Insurance Fund Law while taking the implications of the revision of the Health Insurance Law, which is currently being discussed into consideration.