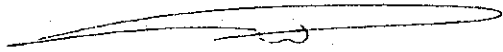


3. S / W

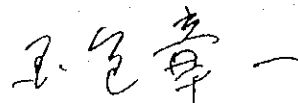
SCOPE OF WORK
FOR
THE STUDY
ON
THE DEVELOPMENT
OF
WATER SUPPLY SYSTEM
FOR
THE DAMASCUS CITY

AGREED UPON BETWEEN
DAMASCUS CITY WATER SUPPLY AND SEWERAGE AUTHORITY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Damascus City, 23rd. March 1995



Eng. M. Adib Zein Elabdin
General Director
Damascus City Water Supply
and Sewerage Authority



Dr. Shoichi Kunikane
Leader, Preparatory Study Team
Japan International
Cooperation Agency

I. INTRODUCTION

In response to the request of the Government of Syrian Arab Republic (hereinafter referred to as "the Government of Syria"), the Government of Japan has decided to conduct the Study on the Development of Water Supply System for the Damascus City (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study, in close cooperation with the authorities concerned of the Government of Syria.

The present document sets forth the Scope of Work with regard to the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to formulate an overall and strategic master plan for appropriately phased improvement / development of the water supply system in Damascus City up to the year 2015 .
2. to conduct a feasibility study for priority project(s) to be selected from the master plan, and to study changes needed in management of the Damascus City Water Supply and Sewerage Authority (DAWSSA) to promote systematic development of water supply services in the city; and
3. to transfer technology on planning methods and skills to the counterpart personnel of DAWSSA.

III. STUDY AREA

The study area shall cover an area of approximately 129km² under the jurisdiction of DAWSSA as shown in appendix 1.

IV. SCOPE OF THE STUDY

In order to achieve the above objectives, the study shall cover the following :

Phase I: Master Plan

1. Understanding of the present conditions of the Study area through existing data and

documents, interviews and field observations on:

- a. climate, topography, geology, hydrology, hydrogeology etc.
- b. social and economic conditions and trends
- c. health and hygienic conditions of population
- d. environmental conditions, legislation and policies
- e. regional and urban development plans and policies
- f. land use

- g. public sanitation services including sewerage, drainage and solid waste management
- h. the existing water supply services with regards to:
 - a) policy
 - b) physical components
 - c) operation and maintenance of facilities
 - d) legal and institutional aspects
 - e) organization and management of DAWSSA
 - f) financial aspects
 - g) economic and social aspects
 - h) environmental aspects
 - i) study on present and future water sources including groundwater
 - j) willingness to pay of consumers
 - k) unaccounted-for water(UFW) in the selected area
- i. studies and on-going projects related to water supply

2. Evaluation of present conditions of water supply services and identification of problems and issues with emphasis on:

- a. progress after the Master Plan of 1968
- b. physical aspects
- c. operation and maintenance aspects
- d. legal and institutional aspects
- e. organization and management of DAWSSA
- f. financial aspects
- g. economic and social aspects
- h. environmental aspects

3. Water demand forecasts up to the year 2015 through projections on:

- a. population growth and urbanization
- b. economic growth and changes in living conditions

4. Formulation of the Master Plan

- a. establishment of basic policies, goals and strategies with appropriately phased time horizon on:
 - a) service ratio
 - b) per capita consumption of water by area
 - c) water quality
 - d) the reduction of UFW
 - e) institutional and operational structure
- b. comparative study of technical alternatives of water supply scheme on such aspects as:
 - a) source of water
 - b) treatment and distribution system arrangements in the supplied area
 - c) measures to reduce UFW
 - d) priority and phasing
- c. selection of the best alternative through comparisons on:
 - a) technical soundness
 - b) financial costs
 - c) cost effectiveness
 - d) environmental impacts
 - e) efficiency of institutional and operational arrangement
- d. schematic lay-out of facilities
- e. UFW reduction plan
- f. operation and maintenance plans of facilities
- g. plans for strengthening institutional capacity of the DAWSSA with emphasis on:

- a) managerial capability
- b) institutional and organizational structure
- c) staffing and manpower development
- d) financial management and effective tariff collection
- h. financial plans including:
 - a) preliminary cost estimation
 - b) target level of cost recovery
 - c) policy on mobilizing financial resources for investment
 - d) tariff policy and billing system
 - e) financial management such as optimum fund arrangement
- i. phased implementation plan
- j. identification of priority project(s)
- k. conduct of Initial Environmental Evaluation (IEE) for the priority project(s)
- l. recommendations

Phase II: Feasibility study on the priority project(s)

1. Confirmation of planning framework
2. In-depth data collection including topographical, geological and hydrogeological surveys on the sites for the new facilities
3. Examination of technical alternatives
4. Selection of the best alternative
5. Preliminary design of facilities and equipment plan
6. Operation and maintenance plans with guidelines for proper operation and maintenance
7. Institutional, organizational and personnel requirements for the implementation of the project(s)
8. Cost estimation and financial management plans including:
 - a. cost estimation
 - b. expected financial sources for investment
 - c. tariff structure
 - d. financial statement
9. Environmental Impact Assessment (EIA)
10. Project evaluation including:
 - a. technical evaluation
 - b. financial evaluation
 - c. economic evaluation
 - d. social evaluation
11. Project implementation plan

V. STUDY SCHEDULE

The Study will be carried out in accordance with the tentative schedule attached in Appendix 2.

VI. REPORTS

JICA will prepare and submit the following reports in English to the Government of Syria:

1. Inception Report:

Twenty (20) copies at the commencement of the first work in Syria.

2. Progress Report (1)

Twenty (20) copies at the end of the first work in Syria.

3. Interim Report

Twenty (20) copies at the beginning of the second work in Syria.

4. Progress Report (2)

Twenty (20) copies at the end of the third work in Syria.

5. Draft Final Report

Twenty (20) copies at the beginning of the fourth work in Syria. The Government of Syria will submit their comments to JICA within thirty (30) days after receipt of the Draft Final Report.

6. Final Report

Forty (40) copies within sixty (60) days, after JICA's receipt of comments on the Draft Final Report.

VII. UNDERTAKINGS OF THE GOVERNMENT OF SYRIA

1. The Government of Syria shall accord privileges, exemptions, and other benefits to the Japanese study team (hereinafter referred to as "The Team"), in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Syria.

2. To facilitate the smooth conduct of the Study, the Government of Syria shall take the following necessary measures:

(1) to ensure the safety of the Team in Syria.

(2) to permit the members of the Team to enter, leave and sojourn in Syria for the duration of their assignment therein, and exempt from foreign registration requirements and consular fees,

(3) to exempt the members of the Team from taxes, duties and any other charges on vehicles, equipment, machinery and other materials brought into and out of Syria for the conduct of the Study,

(4) to exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study.

(5) to provide necessary facilities to the Team for remittances as well as utilization of the funds introduced into Syria from Japan in connection with the implementation of the Study,

(6) to secure permission for entry into private properties or restricted areas for the conduct of the Study,

(7) to secure permission for the Team to take all data and documents (including photographs and maps) related to the Study out of Syria to Japan, and

(8) to provide medical services as needed. Its expenses will be chargeable on members of the Team.

3. The Government of Syria shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.

4. Damascus City Water Supply and Sewerage Authority (DAWSSA) shall act as the counterpart agency to the Team and also as the coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

5. DAWSSA shall, at its own expense, provide the Team with the following, in cooperation with other organizations concerned:

(1) available data and information related to the Study,

(2) necessary number of counterpart personnel,

(3) suitable office space with necessary equipment and clerical services in Damascus City

(4) credentials or identification cards.

(5) appropriate number of vehicles with drivers.

VIII. UNDERTAKINGS OF JICA

For the implementation of Study, JICA shall take the following measures:

1. to dispatch, at its own expense, the Study Team to Syria,

2. to pursue technology transfer to the Syrian counterpart personnel in the course of the Study.

IX. CONSULTATION

JICA and DAWSSA shall consult with each other with respect to any matter that may arise from or in connection with the Study.

The Study on
The Development of Water Supply System
for the Damascas City

TENTATIVE SCHEDULE

DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
WORK IN SYRIA	■	■	■	■	■	■	■	■		■	■	■	■	■	■		
WORK IN JAPAN																	□
REPORT PRESENTATION	▲				▲			▲				▲			▲		F/R
PHASE	PHASE I: Master Plan					PHASE II: Feasibility Study											

NOTE
 IC/R : Inception Report
 P/R : Progress Report
 IT/R : Interim Report
 DF/R : Draft Final Report
 F/R : Final Report

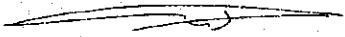
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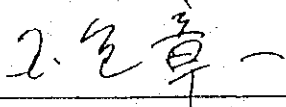
4. M / M

MINUTES OF MEETING
ON
THE SCOPE OF WORK
FOR
THE DEVELOPMENT
OF
WATER SUPPLY SYSTEM
FOR
THE DAMASCUS CITY

AGREED UPON BETWEEN
DAMASCUS CITY WATER SUPPLY AND SEWERAGE AUTHORITY
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Damascus City, 23rd. March 1995


Eng. M. Adib Zein Elabdin
General Director
Damascus City Water Supply
and Sewerage Authority


Dr. Shoichi Kunikane
Leader, Preparatory Study Team
Japan International
Cooperation Agency

In response to the request of the Government of Syrian Arab Republic (hereinafter referred to as "the Government of Syria"), the Japanese Preparatory Study Team (hereinafter referred to as "the Team") was sent by Japan International Cooperation Agency (hereinafter referred to as "JICA") to discuss, with the Damascus City Water Supply and Sewerage Authority (DAWSSA), the Scope of Work (S/W) for the Study on the Development of Water Supply System for the Damascus City (hereinafter referred to as "the Study").

The Team headed by Dr. Shoichi Kunikane stayed in Syria from 13th through 27th March 1995. During their stay in Syria, the Team carried out preparatory field study in the Study Area, received information and held a series of interviews with officials of DAWSSA and other authorities concerned of the Government of Syria. The list of participants is given in the Appendix 1.

The Team also had discussions with officials of DAWSSA and other authorities on the Scope of Work defining the Study to be undertaken by both the Government of Syria and JICA for the successful execution of the Study.

The Team and the Government of Syria discussed and confirmed among others, the following:

1. Title of the Study

Both sides agreed that the title of the Study should be " the Study on the Development of Water Supply System for the Damascus City " .

2. Target year

Both sides agreed that the year 2015 should be the target year of the master plan for the water supply system .

3. Study area

Both sides agreed that the study area for water resources development shall include surrounding areas of Damascus City.

4. Study

(1) DAWSSA requested that the Study should place emphasis on the water resources development and the water leakage control in the distribution network.

(2) DAWSSA requested that the Study should include review of the existing water sources and study on the possibility of developing new water sources with particular attention to the water supply in dry season.

(3) Both sides agreed that DAWSSA shall coordinate with the Ministry of Irrigation in the Study.

(4) Both sides agreed that the study on water resources should be conducted on the basis of the existing data and information.

(5) Both sides agreed that the Study should include water leakage survey in one or two selected water distribution areas.

(6) Both sides agreed that the Study should include survey of the present situation of water consumption in some selected water distribution areas.

(7) Both sides agreed that the organization and management Study of DAWSSA should be basically review on the previous study, "Amelioration de l'Organisation de l'Etablissement" by SEMA and S.L.E.E..

5. Undertakings of DAWSSA

(1) Counterpart personnel

Both sides confirmed that DAWSSA shall assign counterpart personnel of the following expertise during the Study period in Syria:

Water resources management (Hydrogeology / Hydrology)

Water distribution network operation / management

Pumping station operation / management

Leakage control

Water quality analysis

Accounting / financial management

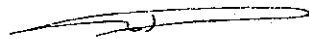
Tariff billing and collection

Organizational matters and personnel management

(2) Both sides agreed that DAWSSA shall provide at least 3 vehicles with drivers and an air conditioned office space of about 200m² including office furnitures and telephone in Damascus by its own expense for the Study Team.

6. Counterpart training

With respect to 2. of "VIII. UNDERTAKING OF JICA "of the S/W , DAWSSA requested to accept at least one counterpart personnel for the training in Japan during the Study. The Team will convey the request to the JICA Headquarters.



Appendix 1.

LIST OF ATTENDANTS

<< Syrian Side >>

Damascus City Water Supply and Sewerage Authority (DAWSSA)

Eng. M. Adib Zein Elabdin	General Director of DAWSSA
Eng. Nibras Mouayad Azem	DAWSSA Major Projects Director
Fahmi Al-Nihlawi	Financial Manager
Ahmad Ousso	Director of Administration and Legal Affairs
Eng. Abd Fattah Miski	Director of Environment and Drinking Water Protection
Eng. Nader Al Mohandess	Director of Water Measures and Water Resources

State Planning Commission

M. Bassam A L Sibai	Director of Technical & Scientific Cooperation
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Ministry of Housing and Utilities

Eng. Hossam Safadi	Minister, Ministry of Housing and Utilities
Eng. Mazen Saffour	Director of Mechanical and Electrical Department

Ministry of Irrigation

Eng. A. R. Madani	Minister, Ministry of Irrigation
Dr. M. Malakani	Director of Water Research Center

<< Japanese Side >>

JICA Preparatory Study Team

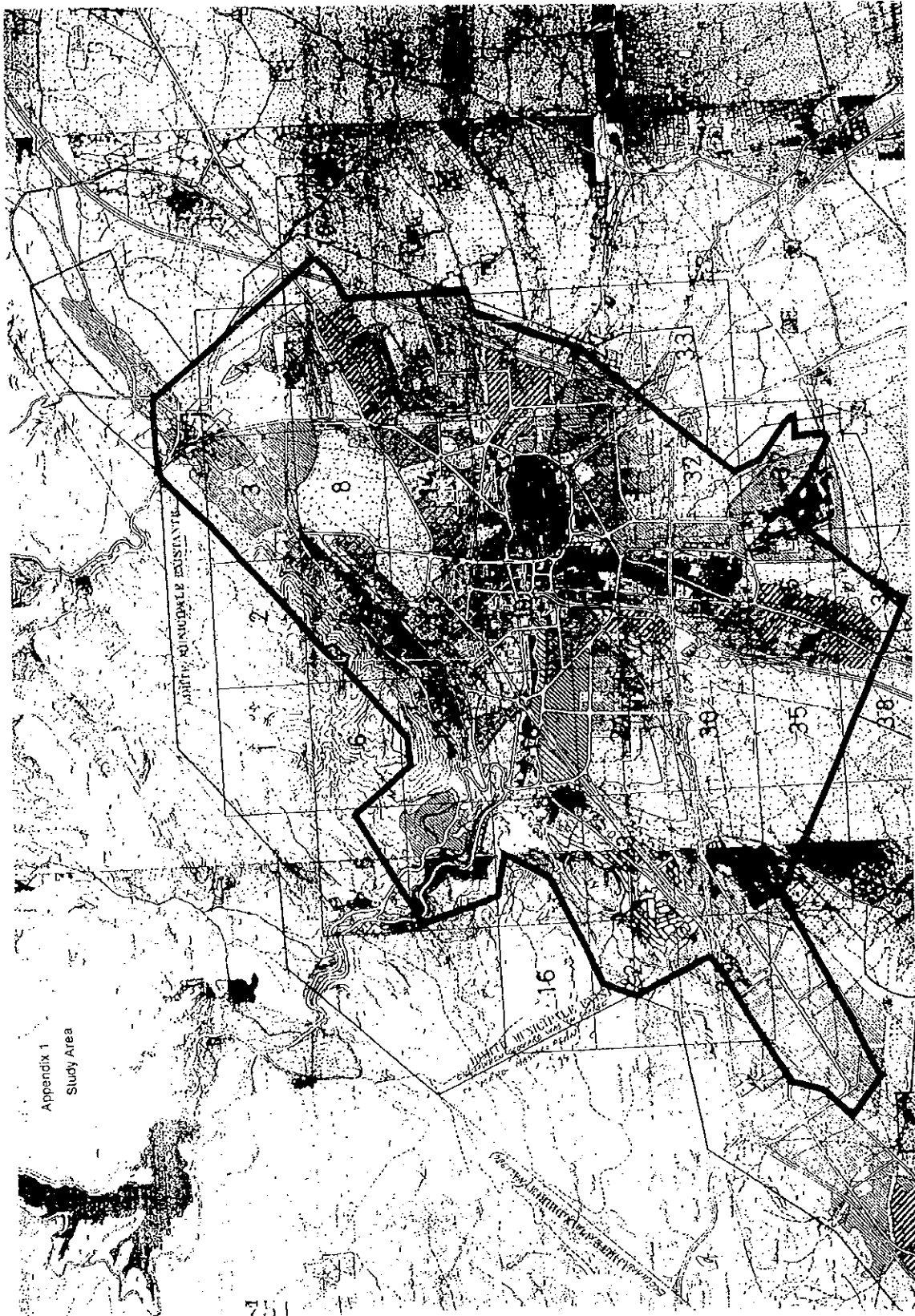
Dr. Shoichi Kunikane	Leader / Water Supply Planning
Mr. Yoshiki Omura	Facility Planning
Mr. Kazuhiko Kikuchi	Study Planning
Mr. Makoto Yasuda	Water Resource Development (Groundwater)/ Environment
Mr. Mikio Akamatsu	Institution / Management

Embassy of Japan

Mr. Keiichi Hasegawa	Counsellor
Mr. Hideaki Yamamoto	Economic Attache

JICA Syria Office

Mr. Takeshi Komori	Resident Representative
Mr. Izumi Tanaka	Assistance Resident Representative



Appendix 1
Study Area

5. 収集資料リスト等

資料1. 収集資料リスト (地下水/環境)

・統計、年報類

- 1)DAMASCUS CITY WATER SUPPLY AND SEWERAGE AUTHORITY (DAWSSA); DAMASCUS AND THE HISTORY OF ITS DRINKING WATER, 1980(?)
- 2)DAMASCUS CITY WATER SUPPLY AND SEWERAGE AUTHORITY (DAWSSA); WATER SUPPLY PRODUCTION, YEAR 1993
- 3)OFFICE OF THE PRIME MINISTER, Central Bureau Statistics; STATISTICAL ABSTRACT 1994 (FORTY SEVENTH YEAR)

・地質図類

- 1)MINISTRY OF INDUSTRY, DEPARTMENT OF GEOLOGICAL AND MINERAL RESEARCH; SCHEMATIC MAP OF THE FIRST-BELOW-THE-SURFACE-WATER-BEARING FORMATION OF SYRIA, 1:1000,000, 1964
- 2)MINISTRY OF INDUSTRY, DEPARTMENT OF GEOLOGICAL AND MINERAL RESEARCH; THE GEOLOGICAL MAP OF SYRIA, 1:200,000, Sheets I-37-VII(Dimashq)/I-36-XII(Beirut), 1966
- 3)MINISTRY OF INDUSTRY, DEPARTMENT OF GEOLOGICAL AND MINERAL RESEARCH; THE GEOLOGY OF SYRIA, 1:500,000, PART I & PART II, 1967
- 4)MINISTRY OF PETROLEUM, ELECTRICITY AND EXECUTION OF INDUSTRIAL PROJECTS, DEPARTMENT OF GEOLOGICAL AND MINERAL RESEARCH; THE GEOLOGICAL MAP OF SYRIA, 1:50,000, Sheet I 37-VII 3a & 3c, 1968

資料2. ローカルコンサルタント、公的研究機関等に関する資料（地下水／環境）

・地形測量

a. 私的

地形測量を請け負う民間会社に関する情報は得られなかった。

b. 公的

国防省（Ministry of Defence）に所属する測量局（General Establishment of Survey）が所轄。

・地質調査

a. 私的

地質調査を行う民間会社は存在しない。

b. 公的

1)石油・鉱物資源省（Ministry of Petroleum and Mineral Resources）の地質調査局（General Establishment of Geological Survey）が所轄。

2)ダマスカス大学（Damascus University）、地質学科（Geological Unit）

・井戸掘削

a. 私的

シリア国内には、数社の井戸掘削をする民間会社が存在する。しかし、そのほとんどが、技術的には問題がないものの、2～3人のスタッフでリグを1台保有するだけの個人経営的な企業である。

b. 公的

総理府（Office of Prime Minister）に所属する建設工事を行う部所があり（通称、Government Company、スタッフ数300人）、そこに10台程のリグを有する井戸掘削の部門がある。

・水質分析

a. 私的

私的な試験室として、Dr. Samir Noury Laboratory があるが、薬剤師の企業組合に所属するものであり、能力、規模等については不明。

b. 公的

公的な試験室としては下記の4ヶ所がある。

- 1)かんがい省 (Ministry of Irrigation) 、水質汚染管理部 (Director of Control of Water Pollution)
- 2)工業省 (Ministry of Industry) 、工業研究所 (Institute of Industrial Studies)
- 3)国立研究所 (National Research Center)
- 4)ダマスカス市上下水道公団 (DAWSSA) 、試験室

・漏水調査

a. 私的

民間会社でこの種の調査を行う所はない。

b. 公的

ダマスカス上下水道公団 (DAWSSA) で行うが、かつては、Dr. Mazen Azen の指導のもとに行った。

資料3. ローカルコンサルタント、その他研究機関における委託調査の価格等に関する資料

・井戸建設関係

掘削費（ケーシング込み、17in.掘削、13in.ケーシング）	LS 1,500/m
*上記掘削費は、民間会社の場合の価格であり、政府会社（Government Office）の場合は、経費の関係で、ほぼ、この2倍になるとのことである。	
建設費（井戸仕上げ、揚水試験込み、17in.掘削、13in.ケーシング）	LS 2,000/m
資機材輸送費	LS 30/km
人件費	
1)技師	LS 700/日
2)技工	LS 500/日
3)助手、人夫	LS 300/日
主要資材（於；ダマスカス）	
1)セメント	LS 2,650/トン
2)砂利	LS 400/m ³
3)砂	LS 400/m ³
4)材木（平均）	LS 15,000/m ³

・水質分析関係

分析費（DAWSSA試験室）	
1)化学分析	LS 2,015/資料
2)バクテリア分析	LS 525/資料

・その他

その他の主要な食料品および日用品等の価格を表-11、表-12に示す。

JICA

