

(2) One major development component of the Project is land consolidation, and this coupled with drainage improvement will serve to promote mechanized farming and enhanced land use through winter cropping, thereby raising the level of farm incomes. The project proposed for the first time implementation of a large scale land consolidation in rice producing area in Iran. In this project, a part of the project cost is as a rule to be met by farmers themselves. It also includes various other issues, e.g., procedural establishment of land reallocation (parcel exchange among farmers) decision on the period of works in adverse climatic conditions, ways of designing, project management, organizing beneficiary farmers, canalization of fund resources for farmers, to which sufficient studies and orderly solutions should be sought and provided for prior to the implementation by the initiative of the relevant administrative agencies.

(3) In implementing land consolidation works, it is indispensable to organize beneficiary farmers setting a unit of 100 ha as a terminal group for farming, coordination with other agencies or organizations as well as office networks of MOA such as ARTSC in the implementation. In addition, it is also essential to secure such follow-up activities as extension activities for the area where land consolidation is completed.

In this respect, CAPIC should be fully utilized with the necessary intensification and expansion of the current scale taking account of the extensive scale of the project components.

(4) The main course of land consolidation comprises land leveling of rice fields. Since such works tend to be operated during rainy winter season, procurement of construction machinery specifically designed for the operation in swamps is essential. Unfortunately, experiences of such works, funding capacities of local contractors or ability in mobilizing construction machinery have not been sufficiently available in Iran. With a view to smoothly implementing the project along with assisting the development of local contractors, it is proposed that the government agencies purchase the construction machinery to lease it to these undertakers of construction works.

(5) The Government of Islamic Republic of Iran plans to execute an efficient, proper management of irrigation/drainage facilities. As to the operation and maintenance of the project facilities after their completion, MOE is responsible for the direct management of those of major water sources, i.e., the storage dam and diversion dams, while the Water Management Corporation is to cover from main canals to tertiary ones, but the terminal facilities commanding less than 100 ha of the beneficiary are managed by the farmers organizations (land consolidation district). In regard to the Corporation, it is newly established in compliance with the mutual agreement among MOA, MOE and Plan and Budget Organization, by positively disintegrating the sectors related to irrigation, that consist of a part of duties undertaken by existing Amol and Babol Water Management Offices. It is also indispensable to actively study and realize the enforcement of laws and regulations for the establishment of the said Corporation, in parallel with the project implementation.

(6) It is also vital to formulate a farmers guidance program by research institutes and extension agencies concerned to steadily pursue the cropping, production and livestock plans as proposed by the project. At the same time along with this program, relevant administrative guidance is desirable to establish farm mechanization program and arrangement for joint use of machinery, coordinated strategies between marketing systems and cooperative activities etc.

(7) The detailed design to be provided prior to the implementation of the project should pay due regard to :

- the provision of topographical maps with the scale 1/10,000 from aerial photographs to keep better conformity among facilities mutually connected, in drawing the detailed design for irrigation and drainage canals, access/maintenance roads, block plan for land consolidation etc.
- the provision of other sets of topographical maps with the scale 1/2,000 for the purpose of more accurate planning and providing detailed designs of land consolidation. Simultaneous cadastral survey conducted for clearly identifying the current status of land-holding.
- the efficient mobilization/application of results from the Benchmark Survey conducted during the study period of the project for the process of land surveys covering canals etc.

- although the detailed designs for basic facilities can be provided by the conventional methods employed by MOE, those for land consolidation will have to be covered for a large tract of land within a short period through the consultation with a number of farmers concerned. To meet this demand, it is actually needed to rapidly train the staff in MOA, implying the necessity of hiring fully experienced consultant(s) therefore.

# ANNEX



## **ANNEX - 1. STUDY AND COMMITTEE MEMBERS AND COUNTERPARTS**

### **(Study Members and Committee Members)**

#### **(1) Study Team**

Team Leader	Satoshi KADOWAKI
Irrigation	Ikuzo IWAMOTO
Drainage	Yasuo MATSUBARA
Facility Planning	Shinya NOZAKI
Facility Planning	Ah Lek NG
Land Consolidation / Facility Planning	Kenichiro KONDO
Landuse Planning / Agronomy	Hideo HARA
Agro-Economy	Mitsuru KAKIZAKI
Topo-Survey	Masao HIOKI
Hydrogeology	Izumi KATO
Design / Cost Estimation	Masahiro OHMIYA
Project Economy	Toshihide SHIBATA

#### **(2) Coordination Committee**

Mr. Jalal Rasoulof	Deputy Minister (Planning), MOA
Mr. M. Shokhan Sanj	General Director, GDA of Mazandaran
Mr. Hosseini	Governor of Amol
Mr. Ali Kaveyani	Governor of Babol
Mr. Sagha Salehi	Representative, Mazandaran Government
Mr. Hassan Ahmadpour	Representative, Mazandaran RWB, MOE
Mr. Rahim A. Omrani	Expert, Plan and Budget Organization

#### **(4) Technical Committee**

Mr. Hasan Askarzadeh	Ex-General Director of Agricultural Engineering Dept., MOA
Mr. Masha-allah Khadjehpour	Senior Expert of Irrigation / Drainage Networks, Agricultural Engineering Dept., MOA
Dr. A. Tavassoli	Head of Soil Reclamation and Drainage, Department of Soil and Water Research Institute, MOA
Mr. S. H. Hodjati	Chief, Babol Rural Service Center
Mr. R. Pour Reza	Chief, Babol Irrigation Office, MRWB
Mr. Ahmadpour	Chief, Amol Irrigation Office, MRWB
Mr. M. Kardgar	Statistic Expert, GDA of Mazandaran

Dr. Mahmood Javan, Ph. D

Irrigation Drainage  
Faculty of Agriculture, Shiraz University

Dr. M. Z. Ahmadi

Associate Professor  
Collage of Agricultural Sciences of  
Mazandaran

## (5) Counterparts

Mr. Jamil Alizadeh Shaegh

Project Manager

Mr. Mohammad Bagher Yousefian

Technical Director

Mr. Nor Hassin Dolati

Deputy Administrative Manager

Mr. Masood Fooladi

Irrigation / Drainage

Mr. Gholamreza Fazeli

Irrigation / Drainage

Mr. Mohammad Abazari

Irrigation / Drainage (\*)

Mr. Mohmoud Tabandeh

Irrigation / Drainage (\*) (\*\*)

Mr. Mohammad Reza Drafshi

Irrigation / Drainage (\*) (\*\*)

Mr. Ahamad Nabavi

Land Consolidation (\*)

Mr. R. Rahbar

Land Consolidation (\*)

Mr. Mohammad Tavakkoli

Facility Plan / Design

Mr. M. Arab

Facility Plan / Deisgn

Mr. Ramzon Moosavi

Design / Cost Estimation

Mr. M. Akbari

Facility Plan / Design (Survey)

Mr. Afshin

Groundwater (\*\*)

Mr. Ahmad Eshraghi

Rice Cultivation (\*)

Mr. Jafar Babapour

Rice Cultivation (\*)

Mr. Karim Masomian

Rice Cultivation

Mr. Mahmud Esmaili

Rice Cultivation

Mr. Hassan A. Davanloo

Seed Improvement (\*)

Mr. Habibullah hashemi

Post Harvest (\*)

Mr. V. M. Fallah

Soil / Water (\*)

Mr. Naser Saadati

Soil / Water (\*)

Mr. B. Hashemmi

Agricultural Machinery

Mr. Rahim Amouzadeh Omrani

Economics (\*)

Mr. Bozorgnejad

Agro-Economy

Mr. Hassan Ezadi

Agro-Economy

Mr. Ghafar Sadre

Agro-Economy

Note: \* : Part time

\*\* : From MRWB, others are from MOA

## ANNEX - 2 LIST OF REFERENCE

No.	Reference	Published	Author
Dr-1	National Engineering Handbook Section 16 Drainage of Agricultural Land	United States Department of Agriculture Soil Conservation Service, May 1971	
Dr-2	National Engineering Handbook Section 4 Hydrology	United States Department of Agriculture Soil Conservation Service Reprinted with minor revisions, 1969	
HY-1	Fluctuation of the Caspian Sea Level as an Indicator of Global Climatic Changes using data from Radiocarbon dating of Sediments	Water Problems Institute of the USSR Academy of Sciences, Moscow, USSR, 1990	YU. A. Karpychev
HY-2	Water Balance of Caspian Sea from 1847 to 1965	Moscow University, 1969	A. Dobrovelski A. N. Kosarev O. K. Leontiev
HY-3	Gradual Increase of the Caspian Sea Surface	1981	Amili
HY-4	FAO Irrigation and Drainage Paper 28 Water Quality for Agriculture	Food and Agriculture Organization (FAO) 1976	
HY-5	Agricultural Engineering Handbook (5th Edition)	The Japanese Society of Irrigation, Drainage and Reclamation Engineering ,1989	
HY-6	Open Channel Hydraulics	McGraw - Hill International Book Company 1985	Ven Te Chow
Mt-1	FAO Irrigation and Drainage Paper 24 Crop Water Requirements	Food and Agriculture Organization (FAO) 1977	

Title : Water Resources Development Project of the Talar, Babol and Haraz River Basins

### A. Basic Study Reports

1. Meteorology
2. Hydrology
3. Geology (Interim Report of Phase I, Vol. 7)
4. Water Requirement and Agricultural Studies
5. Hydrogeology
6. Hydrogeology (Hydrograph Tables)
7. Soil Studies
8. Existing Irrigation Studies
9. Drainage Studies (Existing conditions)



**B. Special Study Reports**

- B-1 Summary Report
- B-2 Irrigation and Drainage Network Plan
- B-3 Deep Drainage
- B-4 Study on Amol Diversion Dam
- B-5 Agricultural Development Study
- B-6 Agro - economical Study
- B-7 Socio - economical Study
- B-8 Livestock Farming Study
- B-9 Water Resources Development and Mangol Dam
- B-10 Project Economic Evaluation

**C. Albums**

- B-2 Irrigation and Drainage Net Work Maps
- B-3 Deep Drainage

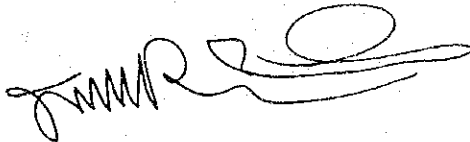
Soil Map.

Traditional Canal Network

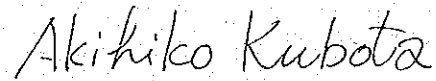
### **ANNEX - 3. SCOPE OF WORK (SW)**

SCOPE OF WORK  
FOR  
THE FEASIBILITY STUDY  
ON  
THE IRRIGATION AND DRAINAGE DEVELOPMENT PROJECT  
IN  
THE HARAZ RIVER BASIN  
IN  
THE ISLAMIC REPUBLIC OF IRAN  
AGREED UPON BETWEEN  
MINISTRY OF AGRICULTURE  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

SEPTEMBER 6th, 1990



Mr. Jalal Rasoulof  
ON BEHALF OF  
MINISTRY OF AGRICULTURE  
THE ISLAMIC REPUBLIC OF IRAN



Mr. Akihiko Kubota  
LEADER OF THE PRELIMINARY  
SURVEY TEAM,  
THE JAPAN INTERNATIONAL  
COOPERATION AGENCY

A.K.

## I. INTRODUCTION

In response to the request of the Government of the Islamic Republic of Iran, the Government of Japan has decided to conduct the feasibility study on the Irrigation and Drainage Development Project in the Haraz River Basin ( hereinafter referred to as "the Study" ), in accordance with the relevant laws and regulations in force in Japan. Accordingly, the Japan International Cooperation Agency ( hereinafter referred to as "JICA" ), the official agency responsible for the implementation of technical cooperation programmes of the Government of Japan , will undertake the Study in close co-operation with the authorities concerned of the Islamic Republic of Iran.

The present document sets forth the scope of work for the Study.

## II. OBJECTIVE OF THE STUDY

The objective of the Study is to evaluate feasibility on the irrigation and drainage development project in the Haraz River Basin in order to increase rice production in the area.

## III. OUTLINE OF THE STUDY

### 1. Study area

The Study area covers gross 105,000 ha in the Haraz River Basin

### 2. Scope of the Study

The activities of the Study team will be divided into two phases as follow:

#### (1) Phase I Study:

Up-dated data collection, site survey, observation and analysis in the Study Area

(2) Phase II study:

- a. additional data collection, detailed survey and observations in the Study area.
- b. feasibility study on the irrigation and drainage development project in the Study area.
- c. Cost and benefit estimation of the projects

3. Work plan for the phase I study

The study covers the following items:

(1) Collection and review of the relevant existing data and information, and field survey including:

1) Natural condition

- a. Topography
- b. meteorology and hydrology
- c. Geology and soil
- d. Others

2) Agriculture

- a. Land use and tenure
- b. Cropping pattern and yield
- c. Agro-economy and institution
- d. Others

3) Agricultural infrastructure

- a. Irrigation and drainage - present situation
- b. Farm road
- c. Other rural infrastructure

4) Socio-economic situation

- a. Population, household and farmers
- b. Regional socio-economy and farm household economy
- c. Extension services
- d. Social and farmers organizations
- e. Agricultural credit
- f. Farmers' intension
- g. Others

5) Other information related to the project

- a. Administrative organizations related to the project
- b. Environmental impact
- c. Others

(2) Formulation of basic concept of the project in the Study area

- a. Outline of irrigation and drainage system
- b. Major infrastructure
- c. Outline of water management

4. Work plan for the phase II study

The Study, based on the results of the phase I study, covers the following items:

(1) Additional data collection, detailed survey and observations in the Study area

- a. Hydrology and meteorology
- b. Geology and soil classification
- c. Land use
- d. Cropping pattern and yield
- e. Irrigation and drainage
- f. Inundation problem
- g. Water requirement
- h. Regional socio-economy and farm household economy
- i. Social and farmers organizations
- j. Construction materials
- k. Environment
- l. Others

(2) Determination of the basic items for the irrigation and drainage development project

- a. Irrigation and drainage canal network and facilities both for rehabilitation and new development
- b. Land consolidation standard,
- c. Land use and cropping pattern
- d. Agricultural production and agro-economy
- e. Water management
- f. Construction materials and equipments
- g. Organization and institutional plan for operation and maintenance

- h. Implementaion organization plan
- i. Alternative development plans

(3) Formulation of the irrigation and drainage development plan for the project

(4) Preliminary design of the major structures of the project

(5) Preparation of the implementation schedule

(6) Estimation of the project costs and benefits

(7) Evaluation of the project

(8) Recommendation

#### IV . WORK SCHEDULE

The Study will be executed in accordance with the tentative work schedule. (See APPENDIX)

## V . REPORTS

JICA shall prepare and submit the following reports in English to the Government of the Islamic Republic of Iran :

1. Inception Report

Twenty (20) copies at the commencement of the Phase I Study.

2. Progress Report I

Twenty (20) copies at the end of the field works of the Phase I Study.

3. Interim Report

Twenty (20) copies at the commencement of the Phase II Study.

4. Progress Report II

Twenty (20) copies at the end of the field works of the Phase II Study.

5. Draft Final Report

Twenty (20) copies within one (1) month after the end of the Phase II Study.

The Government of the Islamic Republic of Iran shall provide its comments on the Draft Final Report within one (1) month after the submission of the Draft Final Report.

6. Final Report

Fifty (50) copies within two (2) months after receiving the comments of the Government of the Islamic Republic of Iran on the Draft Final Report.



VI. UNDERTAKING OF THE GOVERNMENT OF THE ISLAMIC REPUBLIC OF IRAN

In accordance with the laws and regulations in force in Islamic Republic of Iran, the Government of the Islamic Republic of Iran will take the following measures :

1. To facilitate smooth conduct of the Study, as below:
  - (1) to secure the safety of the Japanese study team.
  - (2) to permit the members of the Japanese study team to enter, leave and sojourn in the Islamic Republic of Iran for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees.
  - (3) to exempt the members of the Japanese study team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into the Republic of Iran for the implementation of the Study.
  - (4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowance paid to the members of the Japanese study team for their services in connection with the implementation of the Study.
  - (5) to provide necessary facilities to the Japanese study team for the remittance as well as the utilization of funds introduced into the Islamic Republic of Iran 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 to take all data and documents (including photographs) related to the Study out of the Islamic Republic of Iran to Japan by the Japanese study team.
  - (8) to prepare medical services as needed. the expense will be chargeable on the members of the Japanese study team.
  
2. The Government of the Islamic Republic of Iran shall bear claims, if any arises against the member of the Japanese study team, resulting from, occurring in the course of, or otherwise connected with the 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 Japanese study team.

3. Ministry of Agriculture (hereinafter referred to as "MOA"), shall act as the counterpart agency to the Japanese study team. MOA shall also coordinate other government and non-government organizations concerned, such as Ministry of Energy, Agricultural Engineering Office of Mazandaran Province and Agricultural Department of Mazandaran Province, for the smooth implementation of the Study.

4. MOA shall, at its own expense, provide the Japanese study team with the followings, in cooperation with other agencies concerned;

- (1) available data, maps, and information related to the Study,
- (2) aerial photographs necessary for the study,
- (3) counterpart personnel to assist the Japanese study team and participate in the various activities for the Study,
- (4) suitable offices with necessary equipment in or close to the Study area,
- (5) appropriate number of vehicles with driver in the Study area with their running cost, and
- (6) credentials or identification cards.

#### VII . UNDERTAKING OF JICA

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

1. to dispatch, at its own expense, the Study Team to the Islamic Republic of Iran, and
2. to perform technology transfer to the Iranian counterpart personnel in the course of the Study.

#### VIII . CONSULTATION

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

APPENDIX

TENTATIVE WORK SCHEDULE

	MONTH																	
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	
Phase I	■			□														
Phase II							■			□								
Draft														■				
IV. Report	△ IC/R			△ P/R(I)			△ IT/R					△ P/R(II)			△ DF/R			△ F/R

IC/R: Inception Report

P/R : Progress Report

IT/R : Interim Report

DF/R : Draft Final Report

F/R : Final Report

■ Work in Iran

□ Work in Japan



JICA