添 付 資 料

資料１．　調査団の団員構成

エジプト国バハル・ヨセフ灌漑用水路マゾーラ堰整備計画基本設計調査団

総括：	鈴木　康次郎	JICA 無償資金協力調査部審査課課長代理
技術参与：	吉田　健一	農林水産省構造改善局総務課施設管理係長
計画管理：	辻　　佳輝	JICA 無償資金協力調査部調査第一課
業務主任／運営・維持管理計画：	大坪　和雄	三祐コンサルタンツ
灌漑施設計画／設計：	細野　俊一	三祐コンサルタンツ
施工計画：	丹羽　豊隆	三祐コンサルタンツ
積算／調達計画	寺村　靖夫	三祐コンサルタンツ

エジプト国バハル・ヨセフ灌漑用水路マゾーラ堰整備計画基本設計調査（ドラフト説明）団

総括：	永代　成日出	JICA 国際協力専門員
計画管理：	辻　　佳輝	JICA 無償資金協力調査部調査第一課
業務主任／運営・維持管理計画：	大坪　和雄	三祐コンサルタンツ
灌漑施設計画／設計：	細野　俊一	三祐コンサルタンツ

資料２．現地調査の日程

1） 現地調査行程表 （１９９８年）

日 時	移 動	行 動
3月２２日 (日)	フランクフルト着	東京出発→フランクフルト
２３日 (月)	カイロ着	フランクフルト→カイロ
２４日 (火)		在カイロ日本大使館・国際協力省・公共水資源省灌漑改善事業局・JICA エジプト事務所表敬訪問
２５日 (水)	ベニスエフ着	灌漑改善事業局に調査ｲﾝｾﾌﾟｼｮﾝﾚﾎﾟｰﾄの説明及び協議・カイロ発→ベニスエフ、現地調査、測量・ﾎﾞｰﾘﾝｸﾞ業者現地説明
２６日 (木)	カイロ着	現地サイト調査（既存施設状況調査：マゾーラ堰及びラフーン堰）、ベニスエフ発→カイロ
２７日 (金)		資料整理、団内打ち合せ
２８日 (土)		灌漑改善事業局でサイト調査結果報告及びミニッツ案を協議
２９日 (日)		灌漑改善事業局でミニッツ案を局担当官に提示・説明、コンサルタンツ団員１名到着
３０日 (月)		灌漑改善事業局でミニッツ案に関し最終協議
３１日 (火)		国際協力省で協議覚書（M／D）に署名、コンサル団員２名現地調査・測量ﾎﾞｰﾘﾝｸﾞ調査立会いカイロ◀▶ベニスエフ
4月１日 (水)		JICA カイロ事務所・在エジプト日本大使館に現地調査報告
２日 (木)	官側カイロ発	官団員３名帰国カイロ発→ロンドン、コンサルタンツ団員現地調査カイロ発→ベニスエフ、水資源省地方局、農業省地方局訪問
３日 (金)		現地サイト調査：マゾーラ堰現況調査、流量観測、交通量観測の方法を作業員に実施説明
４日 (土)		現地サイト調査：農業作付け調査・農民意識調査・類似施設の維持管理調査ベニスエフ発→カイロ
５日 (日)		建設資材市場調査、輸入資機材陸路運搬経路調査
６日 (月)		建設資機材市場調査、建設業者調査
７日 (火)		リース会社調査
８日 (水)		類似施設施工現場調査
９日 (木)		電気機械工場調査
１０日 (金)		団内打ち合せ
１１日 (土)		現地調査ｶｲﾛ発→ﾍﾞﾆｽｴﾌ現地補足調査・地方事務所で資料収集・流量観測及び交通量調査結果検収
１２日 (日)		現地調査、類似施設調査、資料収集
１３日 (月)		現地調査、類似施設調査、測量素図受領、ﾚｲｱｳﾄ作成
１４日 (火)		県庁訪問現地補足調査、ﾎﾞｰﾘﾝｸﾞｻﾝﾌﾟﾙ検収ﾍﾞﾆｽｴﾌ発→ｶｲﾛ
１５日 (水)		灌漑改善事業局・JICA エジプト事務所で現地調査結果報告、測量・ﾎﾞｰﾘﾝｸﾞ調査報告書受領
１６日 (木)		灌漑改善事業局でレイアウト及び基本設計調査に必要な設計基準の最終打ち合せ、在カイロ日本大使館・JICA エジプト事務所で最終現地調査結果報告
１７日 (金)	カイロ発	カイロ→フランクフルト
１８日 (土)	フランクフルト発	フランクフルト→
１９日 (土)	(帰国)	→東京

2） 報告書案説明行程表

日 時	移 動	行 動
8月15日 (土)	フランクフルト着	東京出→フランクフルト
16日 (日)	カイロ着	フランクフルト→カイロ
17日 (月)		公共水資源省灌漑改善事業局・JICA エジプト事務所に到着報告
18日 (火)	官団員カイロ着	灌漑改善事業局に調査ドラフトレポートの説明・官団員到着
19日 (水)		在カイロ日本大使館・JICA エジプト事務所表敬訪問・公共水資源省灌漑改善事業局ドラフトレポート協議
20日 (木)		現地調査 カイロ発→ベニスエフ マゾーラ堰とラフーン堰補足調査
21日 (金)		ベニスエフ発→カイロ 団内打ち合せ
22日 (土)		灌漑改善事業局でミニッツ案を局担当官に提示・説明
23日 (日)		灌漑改善事業局でミニッツ案に関し最終協議
24日 (月)		国際協力省で協議覚書 (M/D) に署名・JICA エジプト事務所・在カイロ日本大使館報告官団員帰国
25日 (火)	カイロ発	コンサル団員帰国カイロ→フランクフルト
26日 (火)	東京着	コンサル団員帰国フランクフルト→東京着

資料３．　相手国関係者リスト

相手国の省庁	氏名	役職
公共水資源省	H.E.Dr. Mahmoued Aboud Zeid	公共水資源省大臣
	Eng. Yahiya Abd El-Aziz	灌漑局局長(F.U.S)
	Eng. Nabil Fawzy Nashid	旧灌漑局灌漑改善事業部長(F.U.S.) 新大ダム・堰局局長(F.U.S)
	Eng. Ramsis Bakhoum	旧公灌漑局大ダム・堰局部長 新灌漑局灌漑事業部部長
	Eng. Fayek Abd El-Said	灌漑局水平拡大部部長
	Eng. Zebada	灌漑局水平拡大部課長
	Eng. Liala El-Roby	計画監視局部長
	Eng. Alaa Ismail	灌漑局灌漑改善事業部課長
ベニスエフ公共水資源省地方局	Eng. Mohamed Abd El-Hamed El-Orabie	ベニスエフ水資源省地方局局長
	Eng. Eman Ismail	技術事務所課長
	Eng. Ahmed Farid	灌漑局ベニスエフ地方局次長
	Eng. Said Mashdy	灌漑局灌漑改善事業部ベニスエフ事業所所長
	Eng. Mohaned Kamel	灌漑改善事業部ベニスエフ事業所灌漑普及員
	Eng. Adel Sale	灌漑改善事業部ベニスエフ事業所副所長
	Eng. Ahmed Abd El-Attie	灌漑局ベニスエフ地方局ソムスタ地方支所所長
	Eng. Moubrak Raid Moubarak	マゾウラ地方灌漑・開拓技師
	木村　充 技術顧問	JICA 専門家
ベニスエフ農業省地方局	Eng. Kamel Abd El-Zaher	ベニスエフ農業省地方局局長
	Eng. Kamal Khair Hana	ベニスエフ農業省地方局用水・耕地課長
ベニスエフ地方道路局	Eng. Nour El-Dien Gamal El-Dien	ベニスエフ地方道路局建設所長
ベニスエフ県庁	Mr. Hussen Abd El-Kawe	ベニスエフ県副知事
ファユウム公共水資源省地方局	Eng.Samir Yakoub	ファユウム公共水資源省地方局長
国際協力省（MOIC）	Mr. Ahmed Ragaei	国際協力省次官
	Ms. Sanaa Radwan Kagazi	アジア局局長
	Ms. Samiha Barakat Farag	アジア局日本部部長
在カイロ日本大使館	坂場 三男　公使	
	中野 明久　一等書記官	
JICA エジプト事務所	竹内 喜久夫　所長	
	不破 雅実　次長	
	西野 泰子　所員	

資料4. 議事録

1) 現地調査時

MINUTES OF DISCUSSIONS ON THE BASIC DESIGN STUDY ON THE PROJECT FOR REHABILITATION AND IMPROVEMENT OF MAZOURA REGULATOR OF BAHR YUSEF CANAL IN THE ARAB REPUBLIC OF EGYPT

In response to a request from the Government of the Arab Republic of Egypt, the Government of Japan decided to conduct a Basic Design Study on the Project for Rehabilitation and Improvement of Mazoura Regulator on Bahr Yusef Canal (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Egypt the Basic Design Study Team (hereinafter referred to as "the Team") which is headed by Mr. Yasujiro Suzuki, Deputy Director, Coordination and Appraisal Division, Grant Aid Project Study Department, JICA, and is scheduled to stay in the country from March 23 to April 17, 1998.

The Team held discussions with the officials concerned of Egypt and conducted a field survey at the study area.

In the course of the discussions and field survey, both parties have confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study report.

Cairo, March 31, 1998

鈴木康次郎

Mr. Yasujiro Suzuki
Leader
Basic Design Study Team
Japan International Cooperation Agency

Nabil Fawzi Nashid

Eng. Nabil Fawzi Nashid
Head of Irrigation Improvement Sector (IIS)
Ministry of Public Works and Water Resources
(MPWWR)

Witnessed by:

Sanaa Radwan Hagazi

Mrs. Sanaa Radwan Hagazi
Director General of Asia Department
Ministry of International Cooperation(MOIC)

ATTACHMENT

1. Objective of the Project

The objective of the Project is to provide irrigation water efficiently and stably for the beneficial area around Mazoura Regulator on Bahr Yusef Canal.

2. Project site

The Project site which is 58 km upstream from the Lahoun Regulator on Bahr Yusef Canal, as shown in ANNEX-1, is located in the vicinity of Mazoura village, Beni Suef Governorate.

3. Responsible and Executing agency

The Irrigation Improvement Sector (IIS), the Ministry of Public Works and Water Resources (MPWWR) is responsible for the administration and execution of the Project.
The organization chart of MPWWR is shown in ANNEX-2.

4. Items requested by the Government of Egypt

After discussions with the Team, the following items were finally requested by the Egyptian side.

- Reconstruction of Mazoura Regulator including
  - attached road bridge
  - canal bed protection at downstream side
  - bank protection at upstream & downstream side
  - control house

However, the final components of the Grant Aid will be decided after further studies.

5. Japan's Grant Aid Scheme

(1) The Egyptian side has understood the Japan's Grant Aid Scheme explained by the Team, as described in ANNEX-3.

(2) The Egyptian side will take the necessary measures, as described in ANNEX-4 for smooth implementation of the Project, on condition that the Grant Aid by the Government of Japan is extended to the Project.

6. Schedule of the Study

(1) The consultants will proceed to further studies in Egypt until April 17, 1998.

(2) JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in June, 1998.

(3) In case that the contents of the report is accepted in principle by the Government of Egypt, JICA will complete the final report and send it to the Government of Egypt by the middle of September, 1998.

7. Other relevant issues

(1) Since the land expropriation from the farmers might take a long time in Egypt, both sides agreed to formulate the rehabilitation and improvement plan of Mazoura Regulator which does not include expropriating any land properties.

(2) The Egyptian side explained that the illegally cultivated lands in the Project site should be cleared by the Egyptian side before the commencement of the Project.

(3) The Egyptian side agreed that the Team would set the appropriate width of the attached road bridge, taking into consideration the present traffic condition and the road development plan around the Project site.

(4) Although the Ministry of Transportation has already transferred the property in the navigation locks on Bahr Yusef Canal to the Ministry of Public Works and Water Resources (MPWWR), it was confirmed that a written document on the reclamation of the navigation lock on Mazoura Regulator from the Ministry of Transportation should be taken by the Egyptian side and submitted to the Team by April 17, 1998.

(5) It was confirmed that the Egyptian side should establish the appropriate implementation system including the necessary budget and staff for the operation and maintenance of Mazoura Regulator.

(6) It was confirmed that the Egyptian side should take all possible measures to secure the safety of the Team during the site survey period in Beni Suef.

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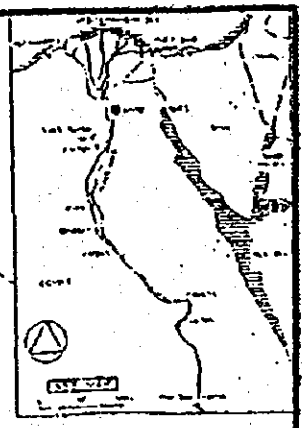
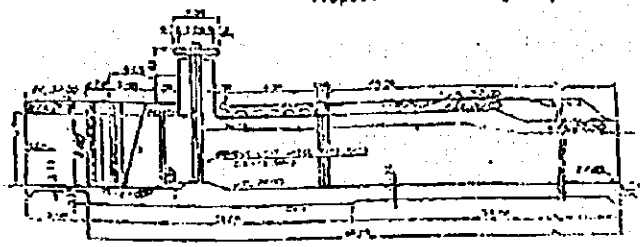
GENERAL PLAN MAP



Command Area

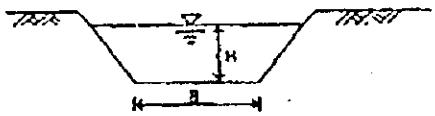
	Minia	Beni Suef	Fayum	Giza	Total
Valley/Old Land	112,101	51,295	361,289	137,300	678,285
Reclaimed Area	33,959	10,859	-	-	43,849
Expansion Planned	-	5,000	40,000	11,000	56,000
Total in feddan	147,308	72,165	401,939	148,300	778,134
(ha)	(61,800)	(30,700)	(168,600)	(62,300)	(323,400)

Proposed Plan of Barrage/Regulator



Dimensions of Proposed Barrage/Regulator

Barrage/Regulator	Weir Width	Vent		Gate	
		No.	Span	Type	Size (W x H x Leaves)
Dairout	34.6 m	4	7.0 m	Double Leaf Wheel Type	7.0 m x 3.30 m x 2
Manshat El. Dahab	43.0	5	7.0		7.0 x 3.25 x 2
Sakoula	38.0	4	8.0		8.0 x 3.20 x 2
Mazoura	51.6	6	8.0		8.0 x 3.05 x 2
Lahoun	42.8	5	5.5		5.5 x 3.15 x 2



Proposed Typical Cross Section

Dimensions of Proposed Canal

Item		Dairout to Manshat Dahab	M.E. Dahab to Sakoula	Sakoula to Mazoura	Mazoura to Lahoun
Discharge	(m³/sec)	223.36	209.82	155.36	134.85
Canal Bed Slope	(constant)	7.15	6.50	7.00	5.60
C. Bed Width (B)	(m)	43.30	43.3	43.3	43.3
Water Depth (H)	(m)	5.70	5.50	5.29	5.03

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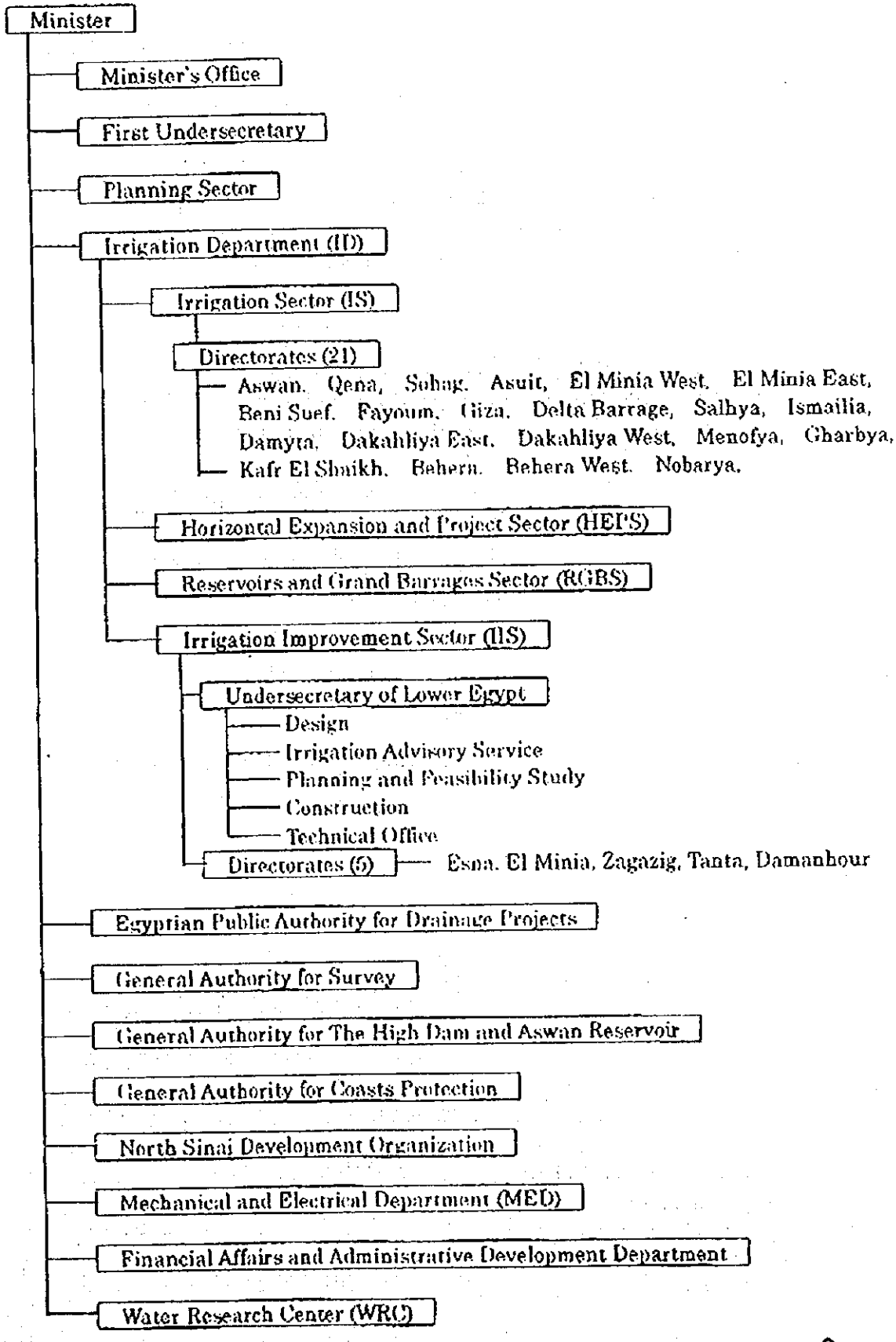
ORGANIZATION CHART OF MINISTRY OF PUBLIC WORKS AND WATER RESOURCES (MPWWR)

(as of March 1998)



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ANNEX-3

Japan's Grant Aid Scheme

1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study (hereafter referred to as "the Study"), conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view..
c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
d) Preparation of a basic design of the Project
e) Estimation of the costs of the Project

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The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid Project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations in the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry (ies) out the Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consulting firm(s) used for the Study which is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

1) What is Grant Aid ?

The Grant Aid Program provides a recipient country with non-reimbursable funds needed to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under the principals in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year in which the Cabinet approves the Project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When both Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of the third country.

However the prime contractors, namely, consulting contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or

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Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of recipient country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:
a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
b) To provide facilities of the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
c) To secure buildings prior to the procurement in case the installation of the equipment.
d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-export"

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

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ANNEX-4

Necessary measures to be taken by the Government of Egypt

The following necessary measures should be taken by the Government of the Arab Republic of Egypt on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project;

2. To secure the land necessary for the execution of the Project, such as the Right of Way, Right of bridge, land for temporary offices, working areas, storage yards and others;

3. To clear the sites prior to the commencement of the construction;

4. To make passable all roads and bridges leading to the Project sites before the commencement of inland transportation of materials and equipment;

5. To bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commissions;

6. To ensure prompt unloading and customs clearance at ports of disembarkation in the Government of the Arab Republic of Egypt and prompt internal transportation therein of the materials and equipment for the Project purchases under the Grant Aid;

7. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Egypt with respect to the supply of the products and services under the Verified contracts;

8. To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contract such facilities as may be necessary for their entry into Egypt and stay therein for the performance of their work;

9. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary;

10. To maintain and use properly and effectively the facilities constructed and equipment provided under the Project;

11. To coordinate and solve any issues related to the project which may be raised from third parties or inhabitants in the Project area during implementation of the Project;

12. To bear all the expenses, other than those covered by Japan's Grant Aid, necessary for the execution of the Project; and

13. To secure the safety of Japanese national engaged in the Project and to provide tight security against riot, insurrection, civil commotion, rebelling and usurped power.

Nabil SH

2) ドラフト説明時

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF MAROURA REGULATOR OF BAHR YUSEF CANAL
IN
THE ARAB REPUBLIC OF EGYPT
(CONSULTATION ON DRAFT REPORT)

In March 1998, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study team on the Project for the Rehabilitation and Improvement of Mazoura Regulator of Bahr Yusef Canal in the Arab Republic of Egypt (hereinafter referred to as "the Project") to Egypt, and through discussions, field survey, and technical examination of the results in Japan, has prepared the draft report of the study.

In order to explain and to consult Egypt on the components of the draft report, JICA sent to Egypt a study team, which is headed by Mr. Narihide Nagayo, Development Specialist, Institute for International Cooperation, JICA and is scheduled to stay in the country from August 18 to August 24, 1998.

As a result of discussions, both parties have confirmed the main items described on the attached sheets.

Cairo, August 24, 1998

Mr. Narihide Nagayo
Leader,
Draft Report Explanation Team, JICA

Eng. Ramsis Bakhoum
Head of Irrigation Improvement Sector
Ministry of Public Works and Water Resources(MPWWR)

Witnessed by:

Mrs. Sanaa Radwan Hagazi
Director General of Asia Department
Ministry of International Cooperation(MOIC)

ATTACHMENT

1. Components of the draft report
   The Government of Egypt has agreed and accepted in principal the components of the draft report proposed by the Team.

2. Japan's Grant Aid System
   (1) The Government of Egypt has understood the system of Japan's Grant Aid System as described in Annex 1.
   (2) The Government of Egypt will take necessary measures, as described in Annex 2 for smooth implementation of the Project, on condition that the Grant Aid by the Government of Japan is extended to the Project.

3. Presentation of the final report
   JICA will make the final report in accordance with the confirmed items and send it to the Government of Egypt by the end of October 1998.

4. Other Relevant Issues

(1) It was reconfirmed that the rehabilitation and improvement plan of Mazoura Regulator shall not include expropriate any land properties.

(2) It was reconfirmed that the Egyptian side shall clear the illegally cultivated lands in the Project site and report the completion of it to the JICA office by the end of March 1999.

(3) It was reconfirmed the Egyptian side shall not utilize the navigation lock on Maroura Regulator any longer, as described in Annex 3.

(4) It was confirmed that the Egyptian side shall accept the draft report's suggestion and establish the appropriate implementation system including the necessary budget and staff for the operation and maintenance of Maroura Regulator.

(5) It was confirmed that the Egyptian side should take all possible measures to secure the safety of Japanese national engaged in the Project.

S.H

Japan's Grant Aid Scheme

1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study (hereafter referred to as "the Study"), conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
d) Preparation of a basic design of the Project
e) Estimation of the costs of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid Project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations in the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry (ies) out the Basic Design Study and write(s) a report, based upon terms of reference set by JICA.
The consulting firm(s) used for the Study which is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

S.H

3. Japan's Grant Aid Scheme

1) What is Grant Aid ?

The Grant Aid Program provides a recipient country with non-reimbursable funds needed to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under the principals in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year in which the Cabinet approves the Project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When both Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of the third country.

However the prime contractors, namely, consulting contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

S.H

6) Undertakings required of the Government of recipient country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.

b) To provide facilities of the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.

c) To secure buildings prior to the procurement in case the installation of the equipment.

d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.

e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.

f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-export"

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

ANNEX-2

Necessary measures to be taken by the Government of Egypt

The following necessary measures should be taken by the Government of the Arab Republic of Egypt on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project;

2. To secure the land necessary for the execution of the Project, such as the Right of Way, Right of bridge, land for temporary offices, working areas, storage yards and others;

3. To clear the sites prior to the commencement of the construction;

4. To make passable all roads and bridges leading to the Project sites before the commencement of inland transportation of materials and equipment;

5. To bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commissions;

6. To ensure prompt unloading and customs clearance at ports of disembarkation in the Government of the Arab Republic of Egypt and prompt internal transportation therein of the materials and equipment for the Project purchases under the Grant Aid;

7. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Egypt with respect to the supply of the products and services under the Verified contracts;

8. To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contract such facilities as may be necessary for their entry into Egypt and stay therein for the performance of their work, according to the laws and regulation enforce in the Arab Republic of Egypt;

9. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary, according to the laws and regulation enforce in the Arab Republic of Egypt;

S.H

10. To maintain and use properly and effectively the facilities constructed and equipment provided under the Project;

11. To coordinate and solve any issues related to the project which may be raised from third parties or inhabitants in the Project area during implementation of the Project;

12. To bear all the expenses, other than those covered by Japan's Grant Aid, necessary for the execution of the Project; and

13. To secure the safety of Japanese national engaged in the Project and to provide tight security against riot, insurrection, civil commotion, rebelling and usurped power.

Annex 3

وزارة النقل
الهيئة العامة للنقل النهرى
ادارة :
ملف :

التاريخ : / / ١٩
الموضوع :
المرفقات :

السيد المهندس/ رئيس قطاع التوسع الافقى ومشروعات تطوير الرى
وزارة الاشغال العامة والموارد المائيـــــة

تحية طيبة وبعـــــد :

بالاحالة الى كتاب سيادتكم رقم ٦٦٧ بتاريخ ٢٩ / ٣ / ١٩٩٨ بخصوص الافادة عن حالـــــة الملاحة النهرية والنقل واحتياجات البحر اليوسفى للاهوســـــة .

الموجو التفضل بالاحاطة بأن البحر اليوسفى ليس ضمن شبكة الطرق الملاحيـة حاليا لكثـــــرة العوائق الملاحية المتمثلة فى الكبارى . فضلا عن أن القطاع المائى لبحر يوسف والاهوسة لاتتناسب مع حركة الوحدات النهرية الآليـــة من حيث الابعاد والحمولات مما يجعل أى مشروع للتطويـــــر باهظ التكاليف وان عائده الاقتصادى ضعيف فى ظل تطور وسائل النقل البرى والسكة الحديـــــد وامتداد شبكة الطرق البرية المرصوفـــــة .

لذلك فان الهيئة ترى عدم جدوى تطوير البحر اليوسفى لخدمة أغراض الملاحة النهريـــــة الآلية ويستطلع رأى وزارة الادارة المحلية فى مدى حاجتها لاستخدام البحر اليوسفى فى أغـــــراض الملاحة الشراعيـــــة .

وتفضلوا بقبول فائق الاحترام ،،،

فى : ٢٠ / ٥ / ١٩٩٨
صبحى

رئيس الادارة المركزية للشئون الفنية

" مهندس/ سمير حسين أمـــــام "

الزهراء ـ أثر النبى ـ مصر القديمة ج.م.ع ت : ٢١٨٧٠٤٦ / ٢١٨٧٠٤٨ ـ فاكس : ٢١٨٧٠٧٩ (٢٠٢)
تلكس : ٢٩٨٠٣ ـ ص.ب : ١١٦٦٦ ـ تلغرافيا : نهر بجيهث

From : Ministry Of Transport
Public Authority For Rivery Transport

To: Ministry Of Public Works And Water Resources

Att: Chief Sector Of Horizontal Expansion & Irrigation Developing Projects.

Dear Sir,

Referring to your letter Ref. No. 667 dated 29/3/1998. Concerning your requests about conditions of Rivery Navigation and Transport and requirements of Canal Locks for Bahr- Youssef.

Kindly be informed that Bahr- youssef now is not included in navigation routes network due to many obstacles in its route such as Bridges. In addition , the water sector of bahr- youssef and its locks is not suitable to the movement of self propelled river boats concerning dimension and loads which makes any project for development extremely expansion and uneconomical in the view of vast developing of other means of transportation such as in-lands, railways and expansion of paved roads grid.

Therefore , the authority see that any project for developing bahr-youssef for Rivery Navigation is in-feasible.

Yours Faithfully,

Chief Of Central Dept.
of Technical Affairs

Eng. Samir Hussein Imam.

資料５．　当該国の社会経済事情

国名	エジプト・アラブ共和国 Arab Republic of Egypt

1998.03　1/2

一般指標

政体	共和制	*1	首都	カイロ	*1
元首	President Mohammed H. MUBARAK	*1	主要都市名	ｱﾚｸｻﾝﾄﾞﾘｱ、ﾌﾙ・ｸﾌｴﾗ、ﾎﾟｰﾄ・ｻｲﾄﾞ	*1
独立年月日	1922年2月28日	*1	経済活動可人口	21,000千人（1995年）	*4
人種(部族)構成	東ﾍﾐﾃｨｯｸ系99%	*1	義務教育年数	8年間（1997年）	*5
			初等教育就学率	89.0 %（1994年）	*5
言語・公用語	ｱﾗﾋﾞｱ語、英語、仏語	*1	初等教育終了率	%（年）	*6
宗教	回教（主にｽﾝﾆ派）94%、ｺﾌﾟﾄ教	*1	識字率	50.5 %（1994年）	*7
国連加盟	1945年10月	*2	人口密度	63.87人/Km²（1996年）	*1
世銀加盟	1945年12月	*3	人口増加率	1.9 %（1996年）	*1
ＩＭＦ加盟		*3	平均寿命	平均61.43　男59.51　女63.46	*1
面積	1,001.45千Km²	*1	5歳児未満死亡率	51/1000（1995年）	*7
人口	63,575.107千人（1996年）	*1	カロリー供給量	3,336.0 cal/日/人（1992年）	*7

経済指標

通貨単位	エジプト．ポンド	*1	貿易額	（1995年）	*8
為替(1US$)	1US$=3.39　（1997年12月）	*8	輸入	3,435.0百万ﾄﾞﾙ	*8
会計年度	7月～6月	*1	輸出	11,739.0百万ﾄﾞﾙ	*8
国家予算	（1993年）	*9	輸入カバー率	11.8月（1995年）	*10
歳入	17,629.5百万ドル	*9	主要輸出品目	原油、石油製品、綿糸、織維（1995年）	*1
歳出	16,650.7百万ドル	*9	主要輸入品目	機械機器、食品、肥料（1995年）	*1
国際収支	-1,827.00百万ドル（1995年）	*9	日本への輸出	69.9百万ﾄﾞﾙ（1996年）	*1
ODA受取額	2,017.00百万ドル（1995年）	*7	日本からの輸入	794.3百万ﾄﾞﾙ（1996年）	*1
国内総生産(GDP)	47,349.00百万ドル（1995年）	*4			
一人当たりGNP	790.0百万ドル（1995年）	*4	外貨準備総額	19,002.0百万ﾄﾞﾙ（1997年10月）	*8
GDP産業別構成	農業　20.0 %（1995年）	*4	対外債務残高	2,395.0百万ﾄﾞﾙ（1995年）	*11
	鉱工業　21.0 %（1995年）		対外債務返済率	14.6 %（1995年）	*11
	ｻｰﾋﾞｽ業 59.0 %（1995年）		インフレ率	10.4 %（1993年）	*7
産業別雇用	農業　40.0 %（1990年）	*7			
	鉱工業　22.0 %（1990年）				
	ｻｰﾋﾞｽ業38.0 %（1990年）		国家開発計画	経済社会開発５ヵ年計画（93～98年）	*11
経済成長率	1.3 %（1995年）	*4			

気象（1961～1990年平均）　場所：Cairo　（標高　116 m）

月	1	2	3	4	5	6	7	8	9	10	11	12	平均／計	
最高気温	18.0	21.0	24.0	28.0	33.0	35.0	36.0	35.0	32.0	30.0	26.0	20.0	28.2 ℃	*12
最低気温	8.0	9.0	11.0	14.0	17.0	20.0	21.0	22.0	20.0	18.0	14.0	10.0	15.3 ℃	*13
平均気温	13.9	15.3	17.7	21.6	24.8	27.7	28.0	27.9	26.5	23.9	19.3	15.1	21.8 ℃	*14
降水量	5	5	5	3	3	0	0	0	0	0	3	5	29 mm	*13
雨期乾期														

*1 CIA World Fact Book 1997-1998
*2 States Members of United Nations
*3 International Financial Statistics Yearbook 1996
*4 World Development Report 1997
*5 UNESCO Statistical Yearbook 1997
*6 Status and Trends 1997
*7 Human Development Report 1997
*8 International Financial Statistics February 1998
*9 International Financial Statistics Yearbook 1997
*10 Global Development Finance 1997
*11 世界の国一覧表 1997年版
*12 最新世界各国要覧 97年版
*13 The Times Book World Weather Guide,Update Edition
*14 理科年表，国立天文台(1997)

国名	エジプト・アラブ共和国 Arab Republic of Egypt

*15

我が国におけるODAの実績

項目＼年度	1992	1993	1994	1995
技術協力	2,699.97	2,892.93	3,087.67	2,796.65
無償資金協力	2,194.95	2,244.22	2,456.48	3,256.28
有償資金協力	5,852.05	3,939.97	4,352.21	3,878.11
総額	10,746.97	9,077.12	9,896.36	9,931.04

*15

当該国に対する我が国ODAの実績

項目＼年度	1992	1993	1994	1995
技術協力	24.46	25.40	20.85	26.41
無償資金協力	44.16	99.20	129.51	141.19
有償資金協力	41.97	150.55	38.63	75.15
総額	110.59	275.15	188.99	242.75

*16

OECD諸国の経済協力実績 （支出純額、単位：百万ドル）

	贈与 (1)	有償資金協力 (2)	政府開発援助 (ODA) (1)+(2)=(3)	その他政府資金 及び 民間資金 (4)	経済協力総額 (3)+(4)
二国間援助 (主要供与国)	1,633.40	56.00	1,689.40		1,689.40
1. アメリカ	650.00	-24.00	626.00		626.00
2. フランス	433.40	15.70	449.10		449.10
3. 日本	167.60	75.20	242.80		242.80
4. カナダ	66.90	-3.70	63.20		63.20
多国間援助 (主要援助機関)	103.40	112.50	215.90		215.90
1. CEC					
2. IDA					
その他	19.60	97.00	116.60		116.60
合計	1,756.40	265.50	2,021.90		2,021.90

*17

援助受入れ窓口機関

技術	関係各省庁→外務省
無償	
協力隊	

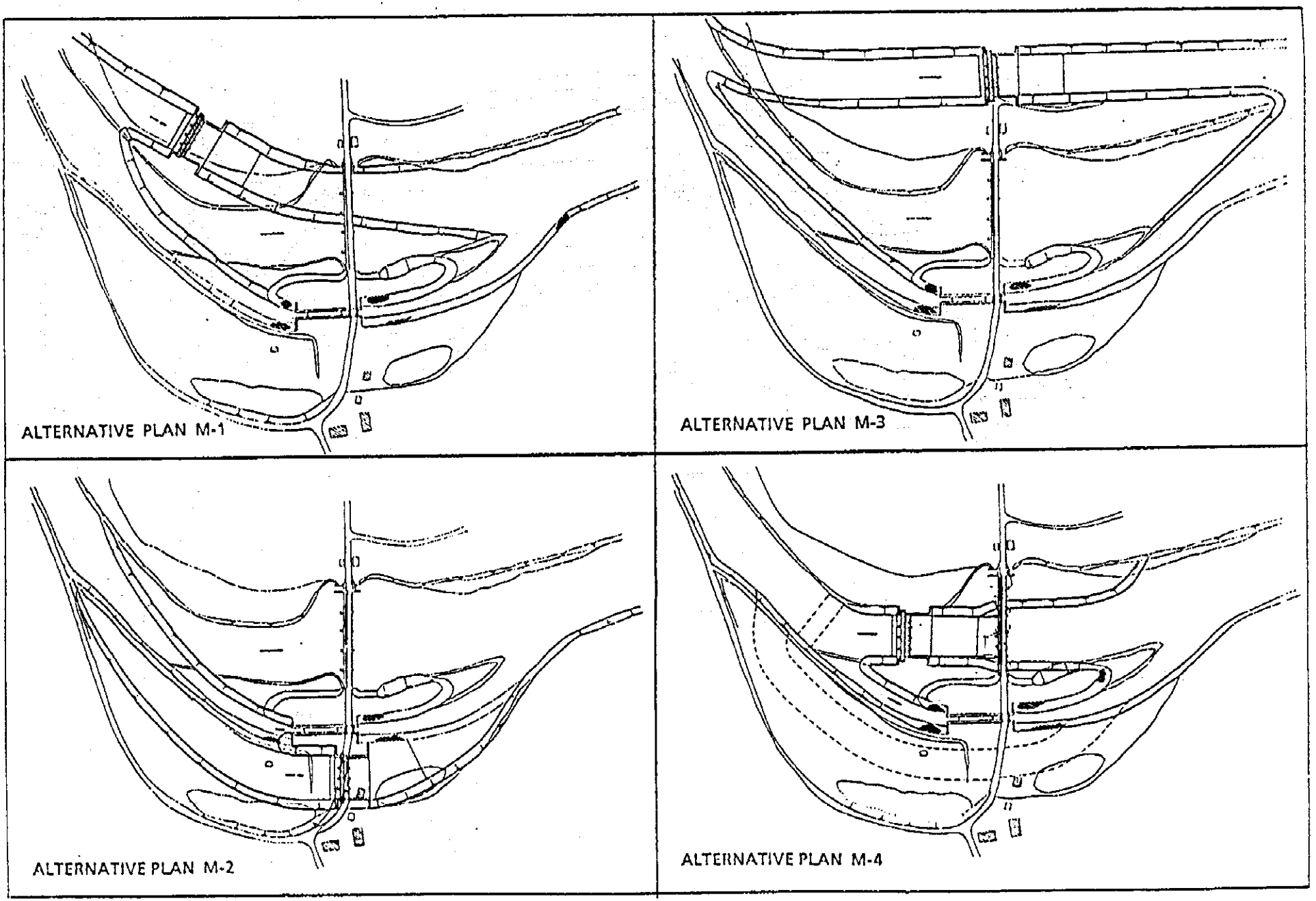
*15 Japan's ODA Annual Report 1996
*16 Geographical Distribution of Financial Flows to Aid Recipients 1991-1995
*17 国別協力情報(JICA)

資料６．　計画堰設置位置の比較図及び選定表（F/S・提案）

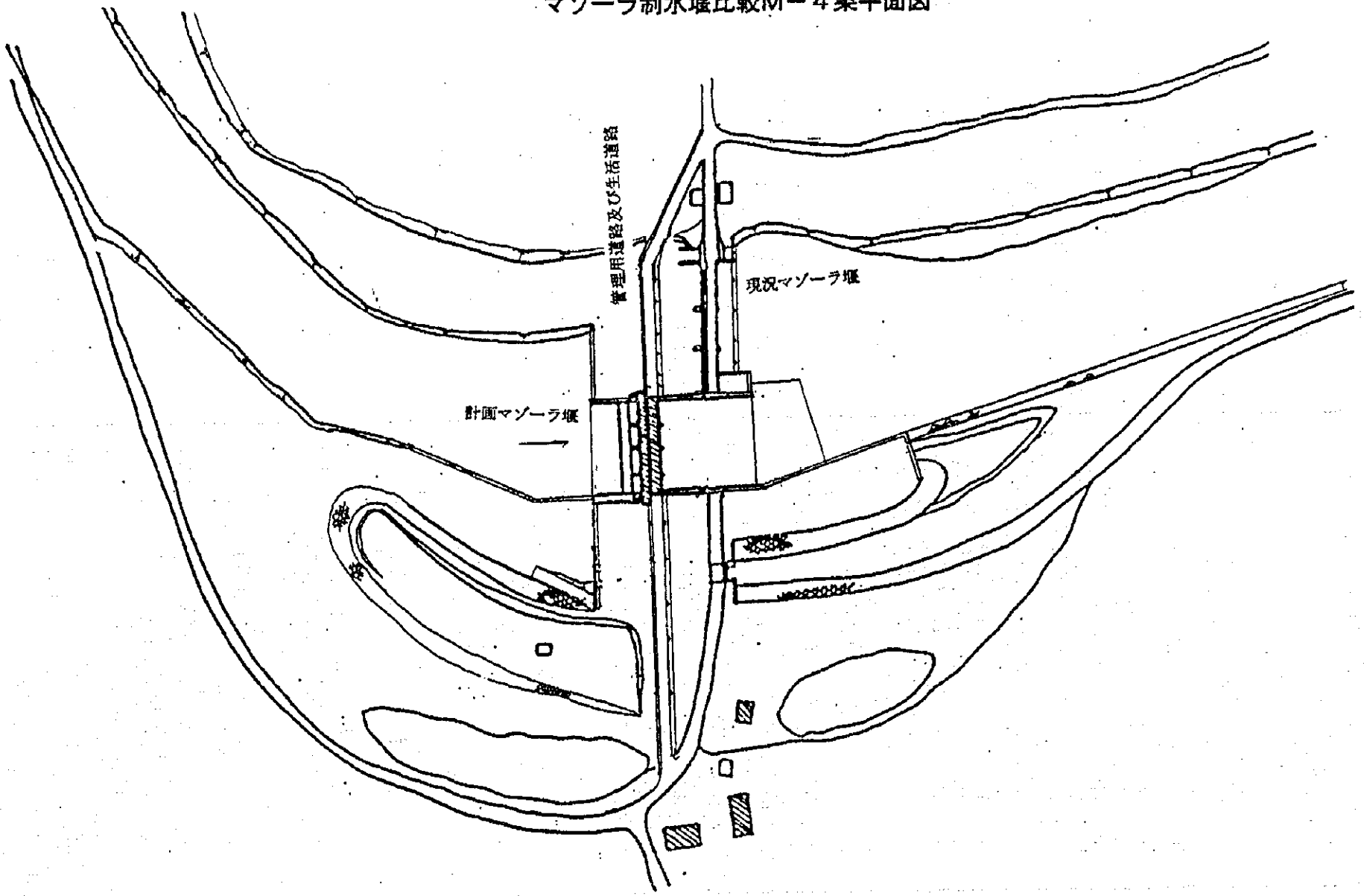
マゾーラ制水堰建設再提案位置の比較

		M－１案		M－２案		M－３案		M－４案		M－４' 案	
F／S時の堰の選定位置		現況堰200m上流の左岸農用地 ﾊﾞﾙﾙ・ﾖｾﾌ用水路をｼｮｰﾄｶｯﾄ		現況堰と同軸で現況船通しの右岸側農用地		現況堰と同軸で80m左岸側の農用地 ﾊﾞﾙﾙ・ﾖｾﾌ用水路のｼｮｰﾄｶｯﾄ		現況堰上流120mの用水路敷内		現況堰上流約20mの用水路敷地内 現況水路の右岸に着岸	
護岸締切方法		鉄筋ｺﾝｸﾘｰﾄT型擁壁		同左		同左		同左		鋼矢板護岸	
付帯橋梁		現況無改修		現況無改修		管理橋を供用		現況無改修		管理橋を供用	
土地収用面積		５フェダン(700万円)		７フェダン(980万円)		１２フェダン(1,680万円)		０フェダン		０フェダン	
仮締切構造		４方鋼矢板ｱｰｽｱﾝｶｰ		同左		同左		同左		３方２重式鋼矢板	
仮設橋		必要無		必要無		必要無		必要無		50m	
仮回し道路		管理用道路として100m		50m		50m		管理用道路として100m		80m	
土木直接工事費（100万円）	土工事	197		225		225		225		97	
	山留工事	166		166		166		166		217	
	躯体	177		177		177		177		177	
	河川護岸	35		35		35		35		27	
	付帯工時	75		69		69		75		72	
	計	650		672		672		678		590	
工期（ヶ月）	仮設	4		6		6		6		4	
	本体	10		10		10		10		10	
	撤去・締切	8		8		8		8		4	
	計	22		24		24		24		18	
比較	1.工事費	9.1	1.工事費	8.8	1.工事費	8.8	1.工事費	8.7	1.工事費	10	
	2.耕地潰れ	-4.2	2.耕地潰れ	-5.8	2.耕地潰れ	-10	2.耕地潰れ	0	2.耕地潰れ	0	
	3.生活道路橋改修	0	3.生活道路橋改修	0	3.生活道路橋改修	0	3.生活道路橋改修	0	3.生活道路橋改修	10	
	4.工事中の通水面積は現況と同じ	10	4.工事中の通水面積は現況と同じ	10	4.工事中の通水面積は現況と同じ	10	4.工事中の通水面積は現況最大流量流下可能	5	4.工事中の通水面積は現況最大流量流下可能	5	
	5.水理的な線形	5	5.水理的な線形	0	5.水理的な線形	0	5.水理的な線形	10	5.水理的な線形	7.5	
	6.施工上の問題点	5	6.施工難易度	7.5	6.施工難易度	10	6.施工難易度	0	6.施工難易度	2.5	
	7.工期	8.2	7.工期	7.5	7.工期	7.5	7.工期	7.5	7.工期	10	
	8.評価点	33.1	8.評価点	28	8.評価点	26.3	8.評価点	31.2	8.評価点	45	
変更提案理由	①エジプトの近況は計画経済から市場経済の移行により貧富の拡大が目立つようになって、原理主義者の活動が極端に走る傾向がある。本ﾌﾟﾛｼﾞｪｸﾄは農業施設を改修する事により農民の生活環境を改善し社会の安定を図る事も含まれる。従って住民との農地収用に関するﾄﾗﾌﾞﾙは代案がある限り極力避けたい。②また、管理用併設橋を極力生活道に供用可能にして地域住民の便を図りたい。M－１案は、堰の併設橋を生活道として供用すると、道路の線形が悪くなるため別に生活道が必要となる。相手国政府には生活道の改築の案が無く、新たに事業実施の立案から完工までには相当な日数が必要と推定される。従って併設橋を生活道として開放できれば地域住民の施設案件に対する評価もあがると想定した。③工事費については、鋼矢板２重締切りによる半川締切りで行えば設計最大流量195m3/sを十分流下でき、締切り鋼矢板の一部を護岸として転用すると工期・工費共に縮減できる。（現況ｹﾞｰﾄ操作と同じ10門扉で対応する。各ｹﾞｰﾄ下流水路流速 V=195/10/3/5=1.3m/s） ④流況は、現況ｹﾞｰﾄ操作によりﾐﾌｼﾞが安定している個所である。従って下流の線形が少し湾曲しているが程度が少なく、ｹﾞｰﾄより50m以上離れ減勢後の現況河川部であるため流速も50cm以下となるため問題は生じない。										

マゾーラ堰改修比較表(F/S 案)



マゾーラ制水堰比較M－4'案平面図



資料７．　併設橋幅m当り概算工事費

参考資料

橋梁上部工比較概算工事単価 2m 当たり積算（増加量のみ）

単位円

種目	仕様	数量	単位	単価	価格
ゴム支承	20te×4n	0.2	m2	542000	108400
ゴム支承設置		0.6	m	12400	7440
アンカーバー		5	本	5022	25110
伸縮継手	sp30	6	m	66500	399000
高欄		0	m		0
鉄筋網		0.011	t	76000	836
スタイロフォーム	t=50	15	m2	1980	29700
	t=20	3	m2	990	2970
コンクリート	橋梁床版	84	m3	16300	1369200
型枠		84	m2	7240	608160
鉄筋	材工共	5.9	t	87500	516250
足場	内部足場	20.3	架m2	2020	41006
計					3108072

土木工事積算標準単価 平成９年度板、建設物価 1998 年 1 月号

資料8. 非常時ゲート操作による下流水位の影響

Examination at an Emergency Case

An emergency case is examined in this clause that is the most dangerous case in an existing canal condition when the maximum existing discharge (Q=140m^3/sec) is flow in the upstream of the Mozoula regulator and the upstream water level is raised up to HHWL 30.30m due to a mis-operatiion of the gates. Then all of the upper leaf gates are lowered completely up to the lowest gate top elevation GTL 27.2m as well as the Lahoun group gates shall be opened accordingly. In this case the maximum discharge is estimated as Qmax=172.16 m^3/sec and the downstream water level raises up to HHWL 30.20 as shown in the Over Flow Discharge Table. This condition may continue in about 14 hours to lower the upstream water level up to HWL 29.70m. This rough estimation is done by using the existing rating discharge curve at the Mazoula Regulator provided by th ID in Benisuef. Based on this estimation the following matters may occur in the down stream of the Mazoura Regulator.

1. The water flows down in the both sides of the existing dikes of the Bahr Yusef Canal not to overflow the dikes.
2. Some of the cultivated area between the both dikes in vicinity of the Mazoura Regulator may be inundated by 50cm in the lower places than EL 30.20m during 14 hours.
3. After the canal excavation is completed by 70cm as the proposal in the F/S report, this inundation ma not occur even in the Maximum discharge conditions (189.79 m^3/sec).

Case 1 Existing Canal

Over flow Discharge

Over Flow
Rectangular Type
Adopeted Formula
Itaya/Tejima's Formula

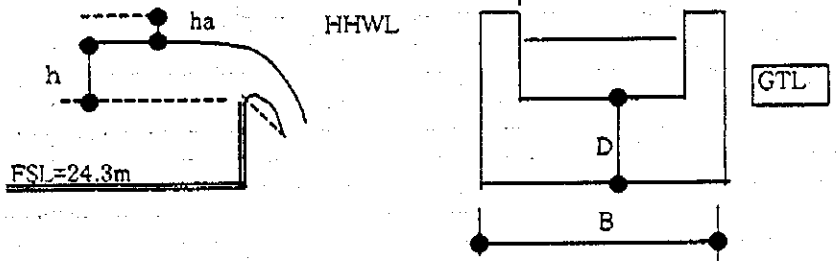
Source; Irrigation, drainage and reclamation engineering hand book

$$Q=Cbh^{3/2}$$

$$C=1.785+0.00295/h+0.237h/D-0.428\sqrt{((B-b)h/(BD))}+0.034\sqrt{(B/D)}$$

Flancis's Formula

$$C=1.84\{1-0.2(h/b)\}$$



B=	8 m	
b=	6.5 m	
HHWL=	30.3 m	
FSL=	24.3 m	Gate Sill Elevation
HGTL=	30.1 m	

Perfect Over Flow Discharge

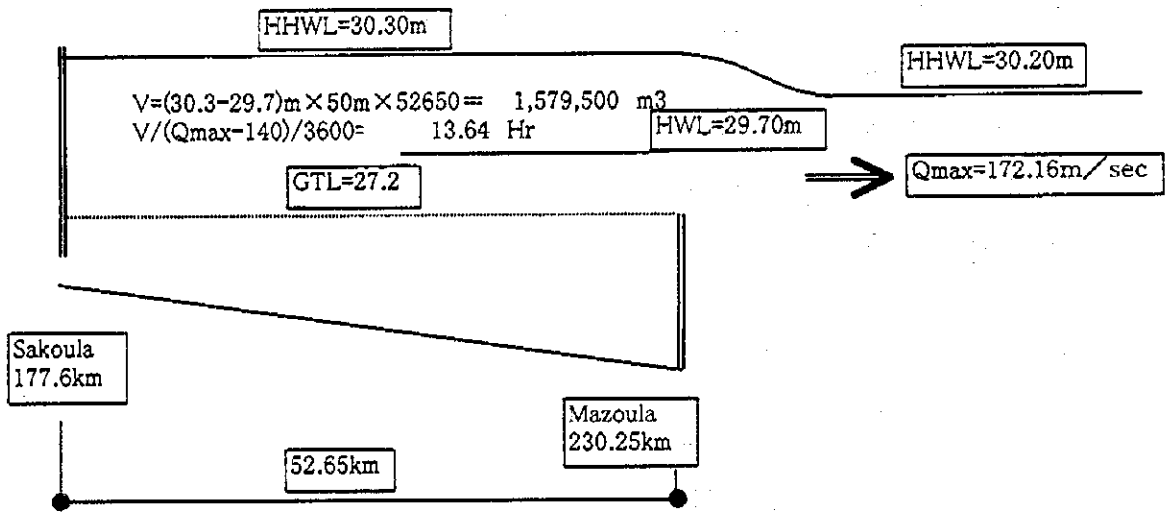
Gate Condition				JIS Formula			Flancis' Formula			Condition for POF			Condition for SOF	
Gate Top Elevation	Flow Depth	Gate Depth	Gate Openning	Flow Coefficient	Flow Discharge	Total	Flow Coefficient	Flow Discharge	Total	Critical Water Level	Down Stream Water Level	Existing DSWL	Submerged Over Flow Discharge	Existing Water Level
GTL=	h=	D=	x=	C=	Q=	4×Q	C=	Q=	4×Q	hc	DWL		4×Q	
30.1	0.2	5.8	0.0	1.778	1.034	4.136	1.829	1.063	4.252	0.00	30.10	26.147		
30.0	0.3	5.7	0.1	1.770	1.891	7.564	1.823	1.947	7.788	0.00	30.00	26.232		
29.9	0.4	5.6	0.2	1.765	2.903	11.612	1.817	2.988	11.952	0.01	29.91	26.333		
29.8	0.5	5.5	0.3	1.763	4.051	16.204	1.812	4.164	16.656	0.01	29.81	26.446		
29.7	0.6	5.4	0.4	1.761	5.319	21.276	1.806	5.456	21.824	0.02	29.72	26.571		
29.6	0.7	5.3	0.5	1.760	6.700	26.800	1.800	6.852	27.408	0.04	29.64	26.706		
29.5	0.8	5.2	0.6	1.760	8.184	32.736	1.795	8.349	33.396	0.06	29.56	26.850		
29.4	0.9	5.1	0.7	1.760	9.767	39.068	1.789	9.929	39.716	0.08	29.48	27.003		
29.3	1.0	5.0	0.8	1.760	11.443	45.772	1.783	11.590	46.360	0.11	29.41	27.164		
29.2	1.1	4.9	0.9	1.762	13.210	52.840	1.778	13.333	53.332	0.14	29.34	27.332		
29.1	1.2	4.8	1.0	1.763	15.063	60.252	1.772	15.141	60.564	0.18	29.28	27.507		
29.0	1.3	4.7	1.1	1.765	17.002	68.008	1.766	17.014	68.056	0.23	29.23	27.688		
28.9	1.4	4.6	1.2	1.767	19.024	76.096	1.761	18.961	75.844	0.29	29.19	27.876		
28.8	1.5	4.5	1.3	1.769	21.128	84.512	1.755	20.957	83.828	0.35	29.15	28.069		
28.7	1.6	4.4	1.4	1.772	23.312	93.248	1.749	23.008	92.032	0.43	29.13	28.267		
28.6	1.7	4.3	1.5	1.775	25.577	102.308	1.744	25.127	100.508	0.51	29.11	28.472		
28.5	1.8	4.2	1.6	1.779	27.922	111.688	1.738	27.282	109.128	0.60	29.10	28.680		
28.4	1.9	4.1	1.7	1.783	30.348	121.392	1.732	29.484	117.936	0.70	29.10	28.893		
28.3	2.0	4.0	1.8	1.787	32.854	131.416	1.727	31.751	127.004	0.81	29.11	29.112	127.004	29.112
28.2	2.1	3.9	1.9	1.792	35.442	141.768	1.721	34.043	136.172	0.93	29.13	29.333	133.449	29.267
28.1	2.2	3.8	2.0	1.797	38.112	152.448	1.715	36.376	145.504	1.07	29.17	29.558	139.684	29.418
28.0	2.3	3.7	2.1	1.802	40.867	163.468	1.710	38.770	[illegible]	1.21	29.21	29.790	145.775	29.565
27.9	2.4	3.6	2.2	1.809	43.709	174.836	1.704	41.181	164.724	1.37	29.27	30.023	151.546	29.704
27.8	2.5	3.5	2.3	1.815	46.640	186.560	1.698	43.628	174.512	1.53	29.33	30.259	157.061	29.838
27.7	2.6	3.4	2.4	1.822	49.663	198.652	1.693	46.135	184.540	1.71	29.41	30.501	162.395	29.967
27.6	2.7	3.3	2.5	1.830	52.782	211.128	1.687	48.649	194.596	1.91	29.51	30.744	167.353	30.086
27.5	2.8	3.2	2.6	1.839	56.000	224.000	1.681	51.194	204.776	2.11	29.61	30.990	167.916	30.100
27.4	2.9	3.1	2.7	1.848	59.325	237.300	1.676	53.800	215.200	2.33	29.73	31.242	[illegible]	30.202
27.3	3.0	3.0	2.8	1.858	62.760	251.040	1.670	56.404	225.616	2.56	29.86	31.494	[illegible]	30.404
27.2	3.1	2.9	2.9	1.869	66.313	265.252	1.664	59.035	236.140	2.81	30.01	31.748	[illegible]	30.607

Perfect Over Flow Discharge

Gate Condition				BS Formula			Blancis' Formula			Condition for POF			Condition for SOF	
Gate Top Elevation	Flow Depth	Gate Depth	Gate Openning	Flow Coefficient	Flow Discharge	Total	Flow Coefficient	Flow Discharge	Total	Critical Water Level	Down Stream Water Level	Existing DSWL	Submerged Over Flow Discharge	Existing Water Level
GTL=	h=	D=	x=	C=	Q=	4×Q	C=	Q=	4×Q	hc	DWL		4×Q	
30.1	0.2	5.8	0.0	1.778	1.034	4.136	1.829	1.063	4.252	0.00	30.10	26.147		
30.0	0.3	5.7	0.1	1.770	1.891	7.564	1.823	1.947	7.788	0.00	30.00	26.232		
29.9	0.4	5.6	0.2	1.765	2.903	11.612	1.817	2.988	11.952	0.01	29.91	26.333		
29.8	0.5	5.5	0.3	1.763	4.051	16.204	1.812	4.164	16.656	0.01	29.82	26.446		
29.7	0.6	5.4	0.4	1.761	5.319	21.276	1.806	5.456	21.824	0.02	29.72	26.571		
29.6	0.7	5.3	0.5	1.760	6.700	26.800	1.800	6.852	27.408	0.04	29.64	26.706		
29.5	0.8	5.2	0.6	1.760	8.184	32.736	1.795	8.349	33.396	0.06	29.56	26.850		
29.4	0.9	5.1	0.7	1.760	9.767	39.068	1.789	9.929	39.716	0.08	29.48	27.003		
29.3	1.0	5.0	0.8	1.760	11.443	45.772	1.783	11.590	46.360	0.11	29.41	27.164		
29.2	1.1	4.9	0.9	1.762	13.210	52.840	1.778	13.333	53.332	0.14	29.34	27.332		
29.1	1.2	4.8	1.0	1.763	15.063	60.252	1.772	15.141	60.564	0.18	29.28	27.507		
29.0	1.3	4.7	1.1	1.765	17.002	68.008	1.766	17.014	68.056	0.23	29.23	27.688		
28.9	1.4	4.6	1.2	1.767	19.024	76.096	1.761	18.961	75.844	0.29	29.19	27.876		
28.8	1.5	4.5	1.3	1.769	21.128	84.512	1.755	20.957	83.828	0.35	29.15	28.069		
28.7	1.6	4.4	1.4	1.772	23.312	93.248	1.749	23.008	92.032	0.43	29.13	28.267		
28.6	1.7	4.3	1.5	1.775	25.577	102.308	1.744	25.127	100.508	0.51	29.11	28.472		
28.5	1.8	4.2	1.6	1.779	27.922	111.688	1.738	27.282	109.128	0.60	29.10	28.680		
28.4	1.9	4.1	1.7	1.783	30.348	121.392	1.732	29.484	117.936	0.70	29.10	28.893		
28.3	2.0	4.0	1.8	1.787	32.854	131.416	1.727	31.751	127.004	0.81	29.11	29.112	127.004	29.112
28.2	2.1	3.9	1.9	1.792	35.442	141.768	1.721	34.043	136.172	0.93	29.13	29.333	133.449	29.267
28.1	2.2	3.8	2.0	1.797	38.112	152.448	1.715	36.376	145.504	1.07	29.17	29.558	139.684	29.418
28.0	2.3	3.7	2.1	1.802	40.867	163.468	1.710	38.770	155.080	1.21	29.21	29.790	145.775	29.565
27.9	2.4	3.6	2.2	1.809	43.709	174.836	1.704	41.181	164.724	1.37	29.27	30.023	151.546	29.704
27.8	2.5	3.5	2.3	1.815	46.640	186.560	1.698	43.628	174.512	1.53	29.33	30.259	157.061	29.838
27.7	2.6	3.4	2.4	1.822	49.663	198.652	1.693	46.135	184.540	1.71	29.41	30.501	162.395	29.967
27.6	2.7	3.3	2.5	1.830	52.782	211.128	1.687	48.649	194.596	1.91	29.51	30.744	167.353	30.086
27.5	2.8	3.2	2.6	1.839	56.000	224.000	1.681	51.194	204.776	2.11	29.61	30.990	167.916	30.100
27.4	2.9	3.1	2.7	1.848	59.325	237.300	1.676	53.800	215.200	2.33	29.73	31.242	172.160	30.202
27.3	3.0	3.0	2.8	1.858	62.760	251.040	1.670	56.404	225.616	2.56	29.86	31.494	180.493	30.404
27.2	3.1	2.9	2.9	1.869	66.313	265.252	1.664	59.035	236.140	2.81	30.01	31.748	188.912	30.607

Down Stream Water Level and Discharge

Water Level at DS (m)	Discharege	
	(MCM/day)	(m3/sec)
27.7	6.00	69.0
27.8	6.30	73.0
27.9	6.60	76.0
28.0	6.90	80.0
28.1	7.30	84.0
28.2	7.65	93.0
28.4	8.00	97.0
28.5	8.40	102.0
28.6	8.80	105.0
28.7	9.50	110.0
28.8	9.85	114.0
28.9	10.20	118.0
29.0	10.55	122.0
29.1	10.95	127.0
29.2	11.27	130.0



資料 9　マゾーラ堰崩壊による想定被害額.

既存のマゾーラ堰が老朽化により崩落した場合の作物減収による被害想定額は年間 12 億円程度と見積もられるが、これがマゾーラ堰の改修により未然に防がれる。

マゾーラ堰の老朽化調査によると、ゲートを支えるレンガ積構造の門柱部において、レンガの剥離・不等沈下・クラックが相当数目視により確認され、ボーリング資料によって内部も相当老朽化が進行していることが確認されている。 建設後約 100 年経過した事を考慮すると、現状のままでは近い将来において堰本体が崩壊することが想定される。

マゾーラ堰の直接潅漑面積は約 22,000ha であり、堰自体が崩壊した場合、少なく見積っても約 30%の面積が潅漑不能に陥る事が予想される。堰崩壊に起因する水位低下は、取水量の減少により、マゾーラ堰掛の受益地に年間 12 億円作物減収を引き起こす。表 1 にマゾーラ堰崩壊による被害想定額を示す。

表 1　　マゾーラ堰崩壊による被害想定額

作付作物	作付面積 (ha)	収量 (t/ha)	生産量 (t)	価格 (LE/t)	生産額(LE1,000)
冬作					
小麦	5,796	5.92	34,312	778	26,695
ベルシーム	1,882	45.70	86,007	40	3,440
ソラマメ	3,151	3.12	9,831	1,079	10,608
野菜	311	6.00	1,866	80	149
その他	7,791	3.00	23,373	100	2,337
夏作					
メイズ	6,547	5.05	33,062	778	25,722
綿花	4,419	1.83	8,087	2,567	20,759
大豆	1,293	3.00	3,879	1,080	4,189
野菜	376	6.00	2,256	80	180
その他	6,579	3.00	19,737	100	1,974
二期作					
メイズ	450	5.76	2,592	778	2,017
野菜	450	6.00	2,700	80	216
計	39,045				98,286
想定年間被害額 (30%)	98,286 LE × .3 ×			38 ¥/LE/1000	11.95 億円

作付け率=39045/22000=177%
作付け面積・ha当り収穫量及びﾄﾝ当り価格は、農業省とIASベニスエフ提供資料による。

資料 10　併設橋の交通量

B／D 現地調査時に調査した併設橋の交通量は表 2 のとおりであった。この表によると、1日の徒歩による通行人は約 5900 人・荷馬車１２０台・トラクター２１０台・ピックアップ６６０台・トラック１００台である。このことから堰の崩壊は農作業のみならず、農作物の輸送等の経済活動にも多大な影響を及ぼすこととなる。現在では併設橋の交通は 3t 以下の車輌に制限されているため、交通量も極端に制限されている。

Numbers of Traffic (1/2)

Direction of Traffic Flow: East to West　　**Time :** 6:00 - 18:00

	05 /04/'98			06 /04/'98			05 /04/'98			06 /04/'98			Total
	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	(6-18)
Truck	11	14	5	6	5	-	10	10	10	2	-	-	73
Pick up	21	39	28	30	40	33	30	39	32	16	27	11	346
Sedan	3	3	6	1	6	6	3	1	3	6	7	2	47
Tractor	16	32	22	9	6	6	13	13	11	-	-	3	131
Horse wagon	1	8	1	-	6	-	2	-	2	1	1	-	22
Bicycle	4	10	22	5	14	4	8	6	9	10	13	8	113
Animal	66	570	133	15	77	21	35	17	29	93	14	11	1,081
Man	241	700	357	215	292	221	250	250	240	144	183	85	3,178

Numbers of Traffic (2/2)

Direction of Traffic Flow: West to East　　**Time :** 6:00 - 18:00

	05 /04/'98			06 /04/'98			05 /04/'98			06 /04/'98			Total
	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	(6-18)
Truck	13	4	-	3	-	-	1	-	2	-	1	-	24
Pick up	15	21	42	33	28	22	22	31	27	21	27	30	319
Sedan	1	1	2	2	2	6	4	4	4	1	2	8	37
Tractor	9	12	7	10	5	1	7	10	11	3	2	-	77
Horse wagon	-	2	-	1	2	8	1	4	2	2	4	2	28
Bicycle	4	4	11	5	9	7	11	5	5	11	12	12	96
Animal	11	9	10	20	62	95	20	18	22	22	25	236	550
Man	139	224	293	303	264	261	223	220	255	172	236	198	2,788

資料 11.　収集資料リスト

収集資料リスト

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3. Information on Irrigation System in Egypt, Irrigation Improvement Project, IIS
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5. The approved budget and the actual used budget for 1992/1993 – 1996/1997, MPWWR
6. The Budget for three years for the Irrigation Improvement Sector (IIS) from 1994/1995 – 1996/1997, MPWWR
7. The Budget Plan for the fiscal year 1998/1999, MPWWR
8. The Irrigation Department Five Years Plan, 1997 – 2002, MPWWR
9. Investment Plan for the fiscal year 98/99, ID, MPWWR
10. Irrigation Improvement Supposed Plan till 2017, IIS, MPWWR
11. Operation and Maintenance for Dams & the Greater Barrages, fiscal year 1996/1997, MPWWR
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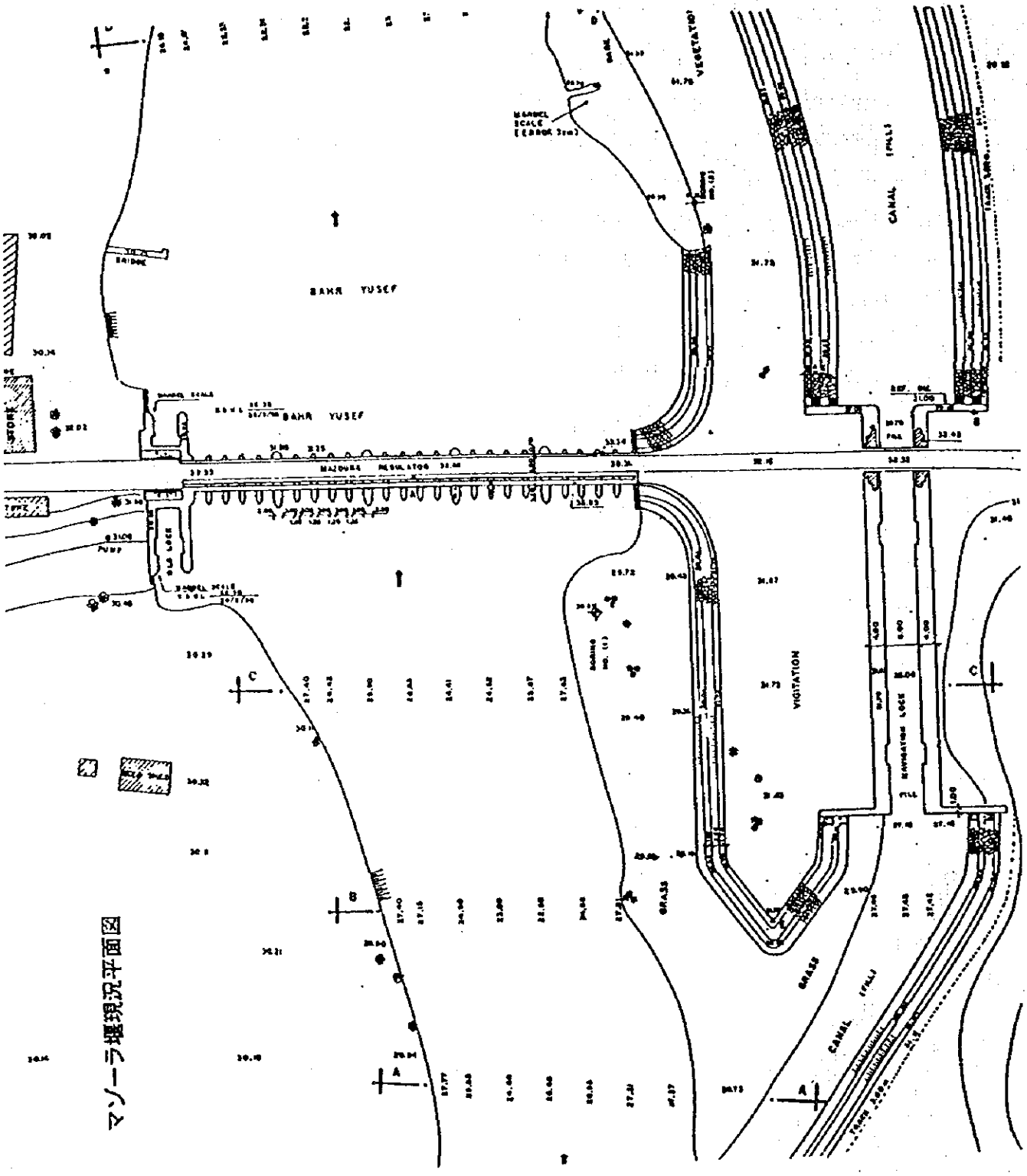
13. Telemetry Project, MPWWR
14. 水管理技術開発調査報告書、平成９年３月、(社) 農業土木機械化協会
15. Drawings for Bridges at Towa Canal, Ahnasia District, Beni Suef Irrigation Directorate, MPWWR
16. The Water Level of Mazoura Regulator, Mar.95 – Mar.98, Beni Suef ID, MPWWR
17. The Water Level of Lahoun Regulator, Mar.95 – Mar.98, Beni Suef ID, MPWWR
18. Table for the discharges downstream Mazoura Regulator, Beni Suef ID, MPWWR
19. Organization Chart of MPWWR, Beni Suef ID and Somosta Irrigation District Office

20. The Rehabilitation and Improvement Plan for the Main Regulators on the Nile River & its branches distributed from 1997/2012, Greater Barrage and Dams Sector, MPWWR
21. General Holidays 1998
22. Japan /Mediterranean Freight Conference Freight Tariff No.2
23. Price of Vacant Land ; Minister Decrees
24. Price of Agricultural Land in Mazoura Area
25. Beni Suef州道路局の道路計画図
26. 道路基準
27. 地形図
28. Insurance of Contractors, Quarries, And Salines

資料１２．マゾーラ堰現況図



マゾーラ堰現況平面図

マゾーラ堰現況図

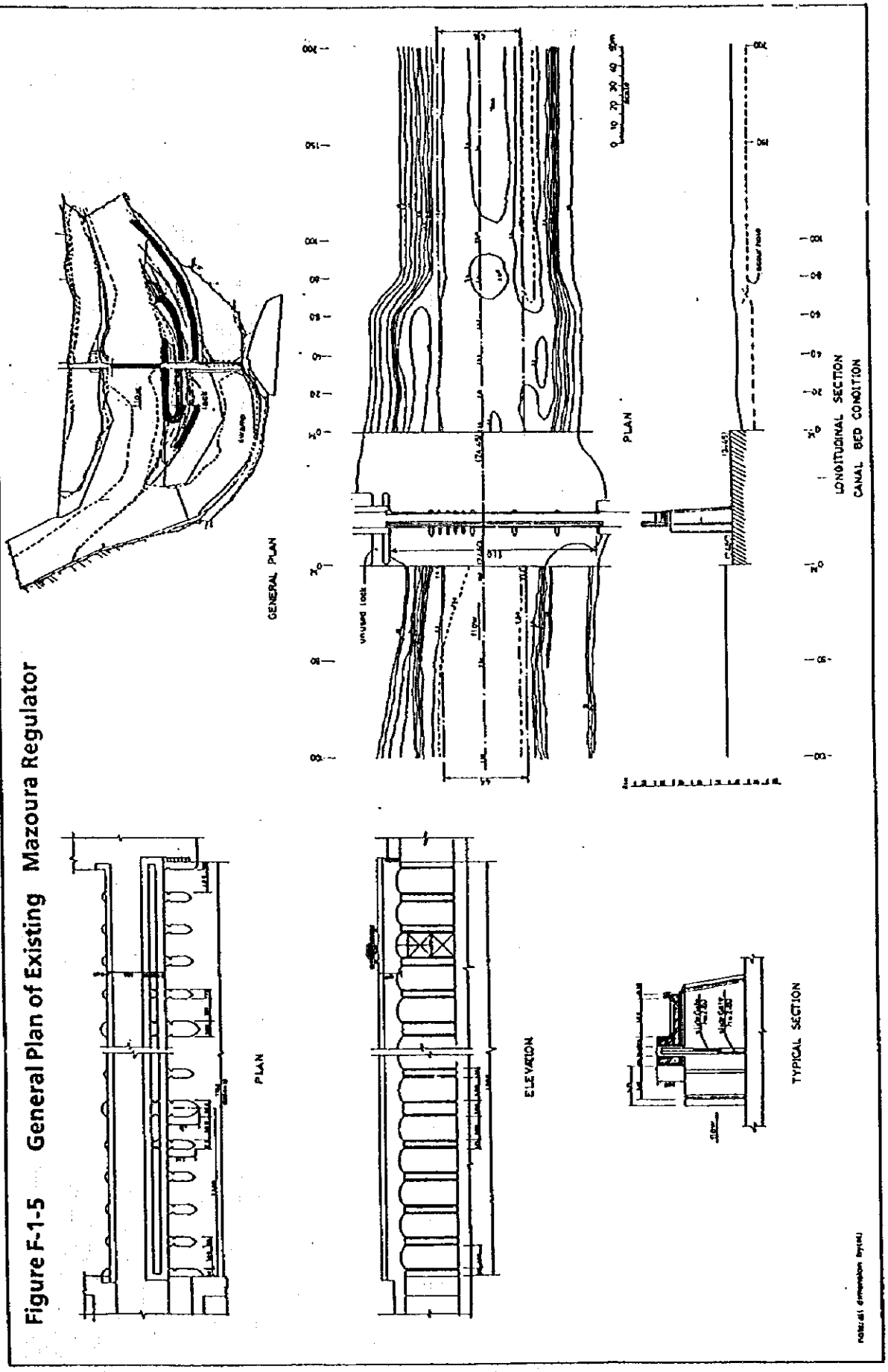


Figure F-1-5 General Plan of Existing Mazoura Regulator