

1. Government of Egypt

The Government of Egypt provided through the Sharqiya Governorate the necessary counterpart staff to the Japanese study team throughout the period for the study at the project site. At the beginning of the study work, the following government personnel were attached to the project:

Eng. Ahmed Kamel Mohamed	Manager of Potable Water and Sewerage, Housing Department, Sharqiya Governorate.
Mr. Ibrahim Mohamed Hassan	Chief of Protocol, Sharqiya governorate.
Mr. Mohamed Hosny	General Manager of Planning Department, Sharqiya Governorate.
Mr. Abdel Baset	Manager of Planning Department, Sharqiya Governorate.
Eng. Fahmy Sheetwy	Zagazig City Municipal Center.

In addition to the above personnel, many other supporting staff from the various agencies have participated in the Study and assisted the study team in efficient and smooth undertaking of the study work throughout the study period.

2. Advisory Committee

The Committee comprises the following personnel:

Mr. Tsutomu Tamaki	Chairman of the advisory committee, Japan Sewage Works Agency.
Mr. Yasuhiro Shinoda	Committee member, Arakawa Ward, Tokyo Metropolis
Mr. Akira Yamane	Committee member, Housing and Urban Development Corporation.
Mr. Jun-ichi Yumikura	Committee member, Japan Sewage Works Agency.
Mr. Shozo Matsu-ura	Coordinator of JICA
Miss Sachiko Misumi	Coordinator of JICA

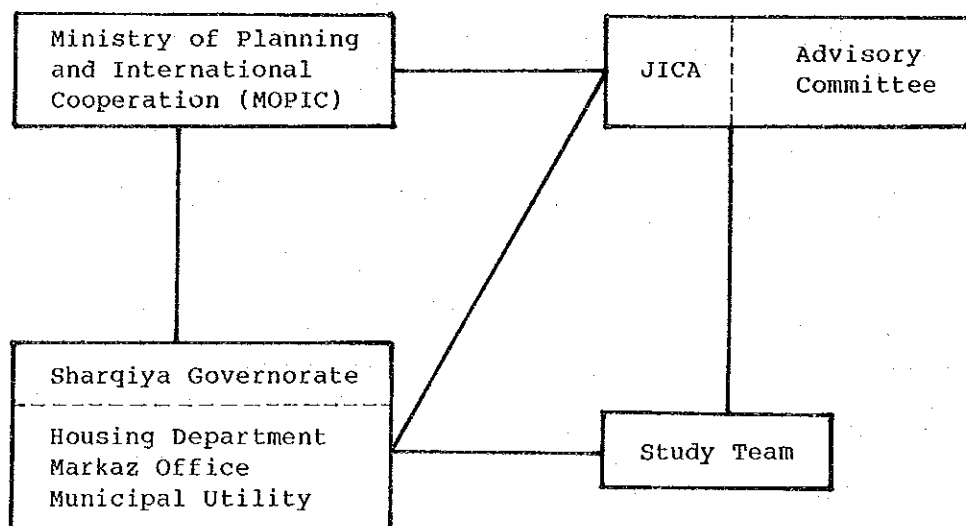
3. JICA Study Team

The JICA study team comprises the following personnel:

Mr. Heiichiro Makino	Team Leader
Mr. Shohei Sata	Sewerage System Planning
Mr. Kaoru Suzuki	Sewerage System Planning
Mr. Takehiko Oga	Sewerage System Planning, Land Survey
Mr. Masafumi Miyamoto	Sewerage Facilities Planning
Mr. Seiichi Hanafusa	Sewerage Facilities Planning
Mr. Hiroshi Machida	City Planning
Mr. Gakuji Kimura	Environment, Sanitation
Mr. Hisashi Takanashi	Economy & Financial Analysis
Mr. Hiromichi Yuasa	Organization & Management
Mr. Kunimasa Izumi	Water Quality Analysis

The relationship between each organization and the study team is shown in Figur XXI-1.

Figure XXI-1 Organization Chart



4. Minutes of the Official Meetings

During the course of the study, seven official meeting were held in the Sharqiya Governorate. Date and subject of each meeting are summarized below, and minutes of meetings are attached herein.

<u>Order</u>	<u>Date</u>	<u>Subject</u>
1st	27 July, 1987	Discussion and confirmation of the Inception Report
2nd	10 August, 1987	Discussion and confirmation of the progress of the study
3rd	26 August, 1987	Discussion and confirmation of the strategic plan of the Sharqiya Governorate
4th	26 September, 1987	Discussion and confirmation of the Progress Report
5th	11 January, 1988	Presentation, discussion and confirmation of the Interim Report
6th	13 March, 1988	Presentation and discussion of the Progress Report II
7th	23 August, 1988	Explanation and discussion of the Draft Final Report

MINUTES OF FIRST OFFICIAL MEETING
ON
INCEPTION REPORT

An official meeting was held at the conference room of the Sharqiya Governorate on the 27th July, 1987, to discuss engineering and economic matters with respect to the Sharqiya sewerage system project, and to confirm the objectives and scope of the study, undertakings of the Egyptian and Japanese Governments, work schedules, and staffing and organization for carrying out the project.

After detailed discussions between the Egyptian counterpart staff and the Japanese study team, the Inception Report has been confirmed by the both parties and all the points clarified. Major features discussed and confirmed are as follows:

1. Project: Feasibility Study on Sharqiya Sewerage System in the Arab Republic of Egypt.
2. Date: From 11:00 a.m to 1:00 p.m., 27th July, 1987.
3. Place: Conference room of the Sharqiya Governorate, Zagazig.
4. Subject: Discussion and confirmation of the Inception Report.
5. Participants:

(a) Sharqiya Governorate

Eng. Ahmed Kamel	Manager of Potable water and sewerage, Housing Dept. Sharqiya Governorate
Eng. Fahmy Sheetwy	Zagazig City Municipal Center.
Mr. Ibrahim Mohamoud Hassan	Chief of Protocol, Sharqiya Governorate.
Mr. Mohamed Hosny	General Manager of Planning Dept., Sharqiya Governorate

Mr. Abdel Baset

Chief of Planning Dept.
Sharqiya Governorate.

(b) JICA

Mr. Takeshi Komori

Deputy Resident
Representative of JICA.

(c) JICA Study Team

Eng. Heiichiro Makino
Eng. Shohei Sata
Eng. Hiroshi Machida
Eng. Kaoru Suzuki

Team Leader.
Sewerage Planning Expert
City Planning Expert
Sewerage Panning Expert.

6. Topics of the Meeting

(a) At the outset of the meeting, Mr. Ibrahim expressed appreciation to JICA's cooperation in undertaking the study and welcomed the members of the study team. He introduced the counterpart staff to the study team and requested the team members that any data and information must be collected through the counterpart staff, otherwise the Governorate could not take responsibility for data and information collected through other channels.

(b) Mr. Komori acknowledged the Governorate's cooperation with the study team and stressed that the agreement for the study was signed between the Sharqiya Governorate and JICA, and the Governorate is fully responsible for the implementation of the project. He introduced the members of the study team to the counterpart staff.

He also emphasized the importance of the study and requested further coordination with the study team for the efficient undertaking and success of the project. He informed that the first Steering Committee would be held in Sharqiya in the mid- August, 1987. Mr. Komori then bridged to Mr. Makino for the presentation of the Inception Report.

(c) Mr. Makino explained the contents of the Inception Report, section by section, following the order of the report presentation. Major points of the explanation were as follows:

The target years for the short-term and long-term programs are 1995 and 2005, respectively, while that for the main sewers is 2040.

The study would be carried out in accordance with the schedule as shown in the Inception Report.

- (d) The study team requested the counterpart staff to cooperate with the team in collecting necessary data and information. Because of the very limited time available for the study, Mr. Makino requested the counterpart staff that all necessary data and information should be ready by the end of August 1987 at the latest.
- (e) Mr. Kamel replied that they will pay every efforts to collect the necessary data and information, however, some of data could hardly be prepared by the end of August. He also added that Mr. Ibrahim is responsible for data with regard to economic and social matters, and Mr. Kamel for technical matters.
- (f) Mr. Ahmed Kamel proposed that the regular weekly meetings between the counterpart staff and the study team can be held either on Saturday or Wednesday.
- (g) At the conclusion of the meeting, Mr. Ibrahim appreciated JICA's cooperation to the project and expressed his sincere hope that the study would be successful with the benefits to the people in Sharqiya Governorate.

The contents of the Inception Report was confirmed by the both parties and the meeting was concluded at 1:00 p.m.

A. Kamel.

Eng. Ahmed Kamel

H. Makino

Mr. Heichiro Makino

MINUTES OF 2ND OFFICIAL MEETING
ON
THE PROGRESS OF THE STUDY

The 2nd official meeting was held at the conference room of the Sharqiya Governorate on the 10th of August, 1987, to discuss the new findings of the study based on the collection of data so far under the attendance of 3 members of the JICA advisory committee, Mr. Tamaki, Mr. Shinoda and Mr. Matsuura.

After the open discussions between the Egyptian counterpart staff, JICA advisory team members and the Japanese study team, many problems were clarified and confirmed by all parties. Major features discussed and confirmed are as follows :

1. Project Feasibility study on Sharqiya Sewerage System in the Arab Republic of Egypt
2. Date : From 10:00 a.m. to 1.00 p.m., 10th August 1987
3. Place : Conference room of the Sharqiya Governorate, Zagazig.
4. Subject : Discussion and confirmation of the progress of the study.
5. Participants :

(a) Sharqiya Governorate

Eng. Ahmed Kamel	Manager of Potable water and sewerage, Housing Department, Sharqiya Governorate
Eng. Fahmy Sheetwy	Zagazig City Municipal Center
Mr. Ibrahim Mohamoud Hassan	Chief of Protocol, Sharqiya Governorate.
Mr. Abdel Baset	General Manager of Planning Department, Sharquiya Governorate

(b) JICA Advisory Committee

Eng. Tsutomu Tamaki	Chairman of the advisory committee and Japan Sewage Works Agency
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Mr. Yasuhiro Shinoda	Committee member and Arakawa Ward, Tokyo Metropole
Mr. Shyozo Matsuura	Coordinator of JICA

(c) JICA Study Team

Eng. Heichiro Makino	Team Leader
Eng. Shohei Sata	Sewerage Planning Expert
Eng. Gakuji Kimura	Environment Expert
Eng. Kaoru Suzuki	Sewerage Planning Expert

6. Topics of the Meeting

- (a) At the outset of the meeting, Mr. Ibrahim expressed appreciation to JICA's close cooperation in the study and welcomed the members of JICA Advisory Committee. He introduced the counterpart staff to the members of JICA Advisory Committee.
- (b) Mr. Makino acknowledged the Governorate's cooperation with the study team and introduced the members of the Advisory Committee to the counterpart staff.
- (c) Mr. Makino explained the Scope of Work and the Minutes of meeting of July 27, 1987 were confirmed.
- (d) Mr. Makino asked about the process of determination of the new five years plan. Eng. Kamel replied that the Governorate demanded the necessary budget for sewerage system of five cities from the Government. Three cities; Zagazig, Minuet el Quam, and Facus were selected, two cities Belbeis and Abu Kebir were delayed. But the situation will change in the future, for example Zagazig's new treatment plant was supposed to be completed several years ago. The budget is given to this project from the government through NOPWASD, but the execution of the project is made by the Governorate.
- (e) Mr. Shinoda asked about the relationship between the budget of the water supply and the budget of sewerage system in the five years plan. Eng. Kamel replied that the parallel execution of water supply and sewerage is strongly requested, even though not same speed. For example the case of Facus city water supply is symbolic because of the lack of sewerage system.

Waste water discharged to drain canal, because of short quantity of irrigation canal, the drain water supplied to the irrigation canal and was mixed together, after that water supply quality was polluted and water supply system stopped for two years. As water supply source now depends on the deep wells, as emergency measure, but water quality is sometimes unsuitable for drinking water because of organic pollution and salinity, so the situation is getting worse. The necessity of sewerage system is the most important for the city. There are several drainage pump stations to supply wastewater to irrigation canals in the Governorate. The detail information about it will be prepared by Eng. Kamel.

- (f) Mr. Makino explained the situation of the data collection. About the population census, Eng. Kamel noted that the preliminary report of the last year census was prepared based on the actual census result and the population of 10th Ramadan is estimated now about 70,000 to 80,000 persons in daytime and 50,000 to 60,000 persons in nighttime.
- (g) Mr. Sata explained the sewerage service level of each city according to the collected data. About the ground water level lowering sewer system, Eng. Kamel explained that Zagazig city is the only city which constructed the sewerage system from the beginning for drainage of wastewater and served already for more than 50 years and it is necessary to rehabilitate the network system, but other cities sewer such as Minet El Quam City, Abu Kebir City, Facus City etc... had been constructed for ground water level lowering sewer system. But after the urban ground water level had been lowered by the surrounding rural areas ground water lowering system prepared by the Ministry of Irrigation, the sewer system has been served as a normal sewer system by blocking the infiltration holes on manholes.
- (h) Mr. Shinoda asked about the sewerage system at the year 2040. Eng. Kamel replied that the alternative plans should be compared between single pipeline and dual pipeline systems from economical and technical aspects. Mr. Sata pointed out the necessity of the criteria in order to compare the alternatives.
- (i) About the training programme of the Governorate staff to Japan, Eng. Kamel noted that according to the agreement signed between Sharqiya Governorate and JICA, JICA has to send an Egyptian Technical counterpart to Japan for training. Also he requested JICA to follow the previous water supply system case in staff number, date and period. He expect that 2 members may stay in Japan for 50 days.

Mr. Matsuura replied that the training period should coincide with the study team homework period in Japan (from October to December 1987), one member will be certain, but two have not been stated yet and the period will be at least 40 days. He promised that he will make an effort as much as possible considering the Governorate intension.

Eng. Kamel stated that after receiving the request from Japanese Government, he will prepare a letter of application to the Japanese Embassy in Cairo.

A. Kamel.

Eng. Ahmed Kamel

H. Makino

Mr. Heichiro Makino

MINUTES OF THIRD MEETING
ON
STRATEGIC PLAN FOR THE LONG-TERM SEWERAGE PROGRAMME

The 3rd official meeting was held at the conference room of the Sharqiya Governorate on 26 August 1987 to discuss a strategic plan for the long-term sewerage programme prepared provisionally by the team. Based on the data collected so far, the team forecasted the urban population in the five (5) medium and eight (8) small cities in the years of 2005 and 2040, and sewerage construction costs have been estimated by using average per-capita cost. A total of 230 million LE will be required for sewerage construction in five medium cities up to 2005. The Egyptian counterpart explained their per-capita construction cost estimation which is far below the team's estimates, and their intention that small cities should also be provided with secondary treatment. In conclusion of the meeting, it was agreed that these estimates would be studied further.

1. Project Feasibility Study on Sharqiya Sewerage System in the Arab Republic of Egypt
2. Date 11:00 a.m. to 1:00 p.m. August 26, 1987
3. Place Conference Room of the Sharqiya Governorate, Zagazig
4. Subject Discussion and Confirmation of the Strategic Plan of the Sewerage System

5. Participants:

(a) Sharqiya Governorate

Mr. Ahmed Sharaway	Secretary General, Sharqiya Governorate
Eng. Ahmed Kamel	Manager of Potable Water and Sewerage, Sharqiya Governorate
Mr. Ibrahim Mohamed Hassan	Chief of Protocol, Sharqiya Governorate
Mr. Mohamed Hosny	General Manager of Planning Dept., Sharqiya Governorate
Mr. Abdel Baset	General Manager of Planning Dept., Sharqiya Governorate

(b) JICA

Eng. Heiichiro Makino	Team Leader
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Eng. Shohei Sata	Sewerage Planning Expert
Eng. Hiroshi Machida	City Planning Expert
Eng. Takehiko Oga	Land Survey Expert
Eng. Kunimasa Izumi	Water Quality Analysis Expert

6. Topics of the Meeting

- a. Mr. Makino appreciated the close cooperation with the Governorate in collecting data. Summarizing the result of the study, he explained the strategic plan of the long term sewerage programme (Appendix 1)
- b. About the population forecast of the urban area, Mr. Makino explained that the urban population of the year 2040 will be investigated more precisely in this September.
- c. Eng. Kamel explained that the actual sewerage construction cost in the Governorate is estimated to be about:
Sewer - 20 LE cap, treatment plant - 15 LE/cap (with present time price). It was agreed that, after collecting the actual costs by the study team through the counterpart, it will be estimated more precisely.
- d. Eng. Kamel advised that, not only medium scale cities, but also small cities need secondary treatment plant plan, regardless of the budget to be allocated..
- e. In concluding the meeting, the General Secretary Ahmed Sharaway appreciated the study team's effort and hoped that this project will be materialized.

*A. Kamel
egyptian*

A. Kamel.

Eng. Ahmed Kamel Mohamed

H. Makino

Eng. H. Makino,
Team Leader

APPENDIX 1

STRATEGIC PLAN FOR THE LONG-TERM SEWERAGE PROGRAMME

Based on the results of the study on the Sharqiya sewerage system, the strategic plan has been worked out indicating a preliminary considerations on the long-term sewerage programme.

1. Population forecast for urban areas

(in 1,000)

City	1976	2005	2040	Remarks
<u>Medium Cities</u>				
Zagazig	203	514	1,000	
Bilbeis	69	167	340	
Abu Kebir	55	117	210	
Faqus	39	93	182	
Minet El Qamh	34	81	164	
Total	400	972	1,894	
<u>Small Cities</u>				
El Diarb Nigm	22	52	102	
El Qenayat	23	49	97	
Hihya	23	56	110	
Mashtul El Soak	22	47	94	
El Ibrahimiya	19	39	77	
Abu Hammad	18	37	74	
El Huseiniya	14	36	73	
Kafr Saqr	14	32	64	
Total	155	348	691	
Grand Total	555	1,320	2,587	

2. Wastewater quantities (daily mean)

Year	Urban area pop.	Unit Wastewater (lcd)	Wastewater quant. (m3/d)
2005	M.C. 972,000	156	151,632
	S.C. 348,000	"	54,288
Total	<u>1,320,000</u>	"	<u>205,920</u>
2040	M.C. 1,896,000	180	341,280
	S.C. 691,000	"	124,380
Total	<u>2,587,000</u>	"	<u>465,660</u>

It should be apparent from the above calculations that for the main sewer constructions, the double barrels system will be more economical than a large single barrel mains. The first main sewer will have the following capacity sufficient for 2005 and then the second barrel having the same capacity as the initial one will be added as required.

3. Construction costs

(a) Per capita construction costs for the sewerage systems in Egypt range between LE 800 and LE 1,200. Assuming that the average cost is LE 1,000, the costs for component facilities may be as follows :

- Sewer network	LE 500/cap
- Pumping station	LE 150/cap
- Treatment plant	LE 350/cap
Total	LE 1,000/cap

(b) In the medium cities, the sewerage systems are relatively well managed without much problems. The immediate improvement measures required for these cities will be the construction of interceptors, pumping stations and primary treatment plants. The necessary costs for these facilities will be :

- Interceptor	LE 140/cap
- Pumping stations	LE 60/cap
- Primary treatment plant	LE 100/cap
Total	LE 300/cap

For Zagazig City sewerage system, the first stage construction of a new sewage treatment plant of 121,000 m³/d capacity is now underway by NOPWASD with the final stage design capacity of 195,000 m³/d. The final capacity of the plant is almost same as the estimated wastewater production of 180,000 m³/d for the year 2040 (one million persons x 0.18 m³/cd). For the year 2005, the wastewater discharge is estimated to be 80,000 m³/d (514,000 x 0.156 m³/cd) and as such, the sewage treatment plant may have roughly 50 per cent allowance in its capacity in 2005.

For the year 2005, it is assumed that LE 180/cap be needed to construct additional secondary treatment facilities for Zagazig City sewage treatment plant. On the other hand, for the small size cities approximately LE 1,000/cap may be required for the sewerage construction, because the small size cities have less sewerage facilities than the medium size cities and, therefore, require more investment for the sewerage construction than the medium size cities. The construction costs for 2005 are then estimated as follows :

- Zagazig City :	514,000 X LE 180/cap = LE 92,520,000
- Other four Cities :	450,000 X LE 300/cap = LE 137,400,000
Total	LE 229,920,000 = LE 230 million
- Small Cities :	348,000 X LE1000/cap = LE 348 million

Thus, the total construction costs required for the sewerage system in the Governorate is assumed to be LE 578 million.

(c) Financial Considerations :

A total of LE 19 million is ear-marked in the new Five-Year Plan for the sewerage construction in the five cities. Taking this and the estimated construction costs for the five cities into account, a sewerage construction programme up to 2005 is envisaged

Following the programme, the construction is divided into four consecutive five-year stages as shown below :

1st stage	2nd stage	3rd stage	4th stage	Total
87/88-91/92	92/93-86/87	97/98-01/02	02/03-06/07	
LE 19 mil	LE 34 mil	LE 70 mil	LE 107mil	LE230mil

In the above estimates, it is assumed that the small size cities construct sewer networks and pumping stations by their own budgets and subsidies from the central and provincial governments.

Foreign currencies may be required for the procurement of mechanical and electrical equipment for pumping stations and sewage treatment plants.

MINUTES OF THE 4TH OFFICIAL MEETING

ON

PROGRESS REPORT

The fourth official meeting was held at the Governor's meeting room on 26, September 1987. Team leader Mr. Makino explained the Progress Report prepared for presentaion of the activities undertaken and findings during the course of the first on-site survey. Intensive discussions were held regarding contents of the Report section by section resulting in some corrections of wording.

A few items which need follow up by Governorate during JICA team's absence in Sharqiya were confirmed. Regarding implementation of the sewerage project, Sharqiya Governorate expressed their intention that all of the 13 cities shall be provided with complete secondary treatment by the year 2005 regardless of the limits of budget, and that less number of the priority cities shall be selected for completion of the secondary treatment for the first stage program rather than provision of the primary treatment for many cities. The Report was approved and accepted by the Governorate. At the end of the meeting, the Governor of Sharqiya, his exelency General Mohamed Amin Mitkess expressed his appreciation to the team and sincere hope for successful realization of the project.

1. Project: Feasibility Study on Sharqiya Sewerage System in the Arab Republic of Egypt.
2. Date: From 12:00 p.m. to 2:00 p.m.
3. Place: Governor's meeting room of the Sharqiya Governorate, Zagazig
4. Subject: Discussion and confirmation of the Progress Report
5. Participants:

(a) Sharqiya Governorate

His Excellency General Mohamed Amin Mitkess

Governor of Sharqiya
(part)

Eng. Fouad Abu El-Azm

Under Secretary of Housing
Dept. Sharqiya Governorate.
(chairman)

Eng. Ahmed Kamel	Manager of Potable Water and Sewerage, Housing Dept. Sharqiya Govenorate
Eng. Fahmy Sheetwy	Zagazig City Municipal Center
Mr. Mohamed Hosny	General Manager of Planning Dept. Shrqiya Governorate
Mr. Abdel Baset	Manager of Planning Dept. Sharqiya Governorate
Mr. Ibrahim Mahamoud Hassan	Chief of Protocol, Sharqiya Governorate

(b) JICA Study Team

Eng. Heiichiro Makino	Team Leader
Eng. Shohei Sata	Sewerage Planning Expert
Eng. Kaoru Suzuki	Sewerage Planning Expert
Eng. Takehiko Oga	Land Survey Expert
Mr. Hiromichi Yuasa	Organization and Management Expert
Mr. Hisashi Takanashi	Economist
Eng. Masafumi Miyamoto	Sewerage Planning Expert

6. Topics of the Meeting:

(a) Chairman of the meeting, Eng. Fouad Abu El-Azm opened the meeting with apology for absence of the Secretary General who was supposed to chair

the the meeting, and expressed his appreciation for efforts made by the team.

- (b) Team Leader, Mr. Makino replied to the chairman expressing his appreciation for the cooperation extended from the Governorate staff concerned. Upon the request by the chairman, Mr. Makino explained the Progress Report section by section.
- (c) Regarding water quality analysis, Mr. Makino mentioned that BOD values analyzed by Laboratory of Ministry of Irrigation in Cairo are unreasonably low, and that the same samples have been brought to the Central Laboratory of the Ministry of Health in Cairo. The results are expected to obtain by the middle of October. A representative of TEC (Tokyo Engineerin Consultants) will send the results to Tokyo and the Governorate does not need to take any action for this matter.
- (d) Regarding population estimation made by CAPMAS, we found calculation mistakes and some questions. Moreover, signature of the responsible person in CAPMAS is missing. In order to use these estimations in the study, official clarification is needed. The Housing Department will take appropriate action to CAPMAS, and corrected official figures will be sent by them to Tokyo through JICA Cairo office.
- (e) Other item which requires Governorate follow up is data about salaries of Govenorate employee for sewerage section. *H. Makino*
- (f) Some questions were raised by the Governorate engineer, and after discussions, below mentioned corrections were made accordingly.
 - i. pp.iii Terminology, 1 Feddan should be 4,200 m² instead of 4,710 m².
 - ii. pp.22 last paragraph, figures regarding topographic survey are estimated provisionally at present, and details will be decided until the commencement of the next on-site work.
 - iii. pp.37, third paragraph, words "towns and" should be deleted.
 - vi. pp.38, fifth line, "5) Faqus City" should be added.
 - v. pp.38, last paragraph, 10 per cent shuld be changed to 90 per cent.

vi. pp.52, delete second paragraph.

- (g) After detail discussions about some technical matters, such as the existing transh system, infiltration rate and dual pipe system, it was agreed that these matters will be further studied and presented in the Interim Report to be submitted in January, 1988, together with appropriate appendices.
- (h) The Governorate engineers insisted that all of the 13 cities should be provided with complete secondary treatment by the year 2005 regardless of the anticipated budget allocation. Also provision of the secondary treatment is necessary to meet the legal requirements. Therefore, they preferred to construct secondary treatment facilities for limited priority cities for the first stage rather than staged program to construct primary treatment by the first stage and secondary treatment at the later stage. The team members explained that there are several alternatives to achieve the final goal and their preference to construct primary treatment facilities for as many cities as possible and then secondary treatment at later stage. This matter will further be studied in home work in Japan, in which Egyptian counterpart personnel may participate.
- (i) The economist Mr. Takanashi then proceeded to explain the part of economic studies. No question was raised.
- (j) At the end of the meeting, his excellency Governor General Mohamed Amin Mitkess made a brief speech expressing his appreciation for the efforts made by the team and his expectaion for the successfull realization of the project. In his speech, his excellency insisted that the benefits of the project, improvement of the environment and utilization of treated effluent for agricultural puoposes, will be appreciated not only by our generation but also by the next generation.
- (k) The meeting was concluded at 2:00 p.m.

For Sharqiya Governorate

A. Kamel.

Eng. Ahmed Kamel

For JICA Team

H. Makino

Eng. Heiichiro Makino

MINUTES OF THE FIFTH OFFICIAL MEETING
ON
INTERIM REPORT

The fifth official meeting was held at the conference room of the Sharqiya Governorate on 11th January, 1988 to present and discuss the Interim Report prepared by the Study Team. His excellency Dr. Mhmoud Sherif, Governor of the Sharqiya ^{Governorate} opened the meeting with his appreciation of the efforts made by JICA and the Study Team. Upon his excellency's request, Mr. Makino, Team Leader, presented the Interim Report which is comprised of four volumes and proceeded to explain the outcomes of the study according to the order of the presentation in the Summary, Volume One of the Report. Before starting the explanation, Mr. Makino requested the attendant to correct errors in the Report, and mentioned that these errors would be corrected in the Final Draft.

After the expalnation made by the Study Team, his excellency suggested the policy of the Governorate related to the development of the sewerage systems in the Governorate. Comments on the Interim Report were expressed by the engineer of the Governorate, and detailed discussions were held on these matters. Conclusions of the discussions are presented in Section 6 of the minutes. Among them, it was agreed that Abu Kebir City would be added to the priority project and therefore feasibility study would be conducted for the City provided that the necessary survey data are provided to the Study Team by the Govenorate by the end of February.

The Stduy Team requested that any comments by Marakaz officials, particularly on sewerage facilities design would be accepted if these are received by the end of February. Also, requests were expressed by the Team regarding information needed for water quality survey and topographic survey, and accepted by the Governorate. Major features ^{which were} discussed and confirmed are as follows:

1. Project: Feasibility Study on Sharqiya Sewerage System in the Republic of Egypt
2. Date: From 12:00 p.m. to 2:30 p.m., 11 th January, 1988.
3. Place: Conference room of the Sharqiya Governorate, Zagazig City.
4. Subject: Presentation, discussion and confirmation of the Interim Report.

5. Participants:

(a) Sharqiya Governorate

H.E. Dr. Mhmoud Sherif (part)	Governor of Sharqiya
Eng. Ahmed Kamel	Manager of Potable Water and Sewerage, Housing Dept.
Mr. Mohamed Hosny	Genral Manager of Planning Dept.
Mr. Abdel Baset	Manager of Planning Dept.
Mr. Ibrahim Mahamoud Hassan	Chief of Protocol

(b) JICA Advisory Committee

Eng. Tsutomu Tamaki	Chairman of the Advisory committee, Japan Sewage Works Agency
Mr. Akira Yamane	Advisory committee member, Housing and Urban Dedelopment Corporation
Mr. Jun-ichi Yumikura	Advisory committee member, Japan Sewage Works Agency
Miss Sachiko Misumi	Coordinator of JICA

(c) JICA Study Team Member

Eng. Heiichiro Makino	Team Leader
Eng. Masafumi Miyamoto	Sewerage Planning Expert
Eng. Kaoru Suzuki	Sewerage Planning Expert
Eng. Hiroshi Machida	City Planning Expert
Mr. Hiromichi Yuasa	Organization and Management Expert
Eng. Gakuji Kimura	Environmental Expert
Eng. Seiichi Hanafusa	Sewerage Planning Expert

Eng. Kumimasa Izumi

Water Quality Specialist

Eng. Takehiko Oga

Survey and Sewerage Planning
Expert

6. Topics of the Meeting

(a) Suggestions given by — his excellency, Governor of Sharqiya, are as follows:

- It is the national policy to limit the expansion of urban area to a certain limit to conserve the agricultural areas. Therefore, development of the urban area would likely to be occur within the foreseeable urban areas.
- In Egypt, it is a general technical consideration that the major facilities of sewerage are planned based on the projection at 50 years time span.

(b) Comments made by the engineer of the Governorate are as follows:

- Population estimation made by the Study Team is not to be modified, although there are some minor difference between those made by CAPMAS and those by the Study Team.
- It is appreciated by the engineer that the calculation of the wastewater flow was made taken into considerations the wastewater produced by the inhabitants who are not provided with the potable water at present.
- It was agreed after discussions that design BOD concentration of 300 mg/l will be further discussed and to be confirmed. The Study Team mentioned their intention to perform the water quality sampling at two places during the period of the present field survey. Analysis will be carried out by the Central Laboratory of the Ministry of Health. The Study Team mentioned that change of the design BOD concentration, if any, will not affect the design of the facilities of sewers, pumping stations and primary treatment.
- The Governorate engineer requested that Abu Kebir City should be included in the first priority project up to 1995, since recent water quality analysis revealed organic contamination of the well waters by the existing wastewater disposal systems and implementation of the sewerage project is of the urgent necessity for the City. The Study Team explained the reasons why the four cities were selected for the first priority project, and mentioned difficulty to add Abu Kebir City to first priority project.

After intense discussions, it was agreed that if the Governorate provides the necessary leveling survey data to the Team by the end of February, Abu Kebir City will be included for the first priority project and feasibility study will cover the City.

- Regarding the design of trunk sewers, the Governorate engineer pointed out the following three questions and requested strongly to change the design of gravity trunk sewers according to their requirements.

- i In Appendix XI, Volume Three of the Interim Report, design flow rates in 2040 should be calculated based on the assumption made in case-1 instead of case-2, since expansion of the urban areas is restricted by the government and expansion beyond the 2005 boundaries is not likely to occur.
- ii Design of the trunk sewers should be based on the peak flow rates and full flow and therefore allowance in addition to the peak wastewater flow including infiltration for the trunk sewers should be eliminated.
- iii Although the study indicates advantages of the double barrel system, single barrel trunk sewers for 2040 flows should be adopted since difficulties are envisaged for the construction of double barrel of gravity sewers.

The Study Team explained the reasons for the first two questions, and then insisted to adopt double barrel sewer lines. After long discussions, it was agreed that single barrel trunk sewers for 2040 flows would be considered as an alternative design for the five cities selected for the feasibility study, and that design of trunk sewers for other eight cities would be reviewed according to the results of the alternative study. For the calculation of the flow rates in 2040, assumptions made in the Appendix XI would be used, however infiltration flows in case-1 would be used and design allowance for pipes would be neglected.

(c) Requests by the Study Team

- Leveling survey data for Abu Kebir City should be provided to the Team by the end of February.
- Immediate coordination with Governorate and Marakaz engineers to commence the survey in the next week for the four cities was requested.

- Coordination with the Governorate engineers to conduct water quality analysis was requested.
- Any comments on the Interim Report by Marakaz engineers should be collected by the Governorate and submitted to the Team by the end of February.

Requests were accepted by the Governorate engineer and he promised close coordination with the Team.

The meeting was concluded at 2:30 p.m.

For Sharqiya Governorate

A.K. Mowafy

Eng. Ahmed Kamel

For JICA Team

H. Makino

Eng. Heiichiro Makino

Witnessed

T. Tamaki

Eng. Tsutomu Tamaki
Chairman,
JICA Supervisory Committee

MINUTES OF THE SIXTH OFFICIAL MEETING
ON
PROGRESS REPORT II

The sixth official meeting was held at the conference room of the Sharqiya Governorate on 13th March, 1988 to present and discuss the Progress Report II prepared by the study team.

Mr. Makino, team leader, commenced the meeting on the request by the Governorate engineer with explanation of the Report. Study team members Mr. Miyamoto and Mr. Takanashi continued the explanation. After the explanation, discussions were held regarding the contents of the Report.

At the end of the meeting, water quality testing equipment were donated to the Governorate from JICA. The meeting was concluded at 12:00 p.m. Major features discussed and confirmed are as follows:

1. Project: Feasibility Study on Sharqiya Sewerage in the Republic of Egypt
2. Date: From 10:30 a.m to 12:00 p.m, 13th March, 1988.
3. Place: Conference room of the Sharqiya Governorate.
4. Subject: Presentation and discussion of the Progress Report II
5. Participants:

(a) Sharqiya Governorate

Eng. Ahmed Kamel Mohamed Mowafy	Manager of Potable Water and Sewerage, Housing Dept.
Mr. Abdel Baset Abdel Aziz	Manager of Planning Dept.
Mr. Ibrahim Mahmoud Hassan	Chief of Protocol
Eng. Fahmy Shetawy	Zagazig City Municipal Center

(b) JICA Study Team

Eng. Heiichiro Makino	Team Leader
Eng. Masafumi Miyamoto	Sewerage Facilities Planning

Eng. Kaoru Suzuki Sewerage System Planning

Mr. Hisashi Takanashi Economist

(c) JICA Advisory Committee

Mr. Jun-ichi Yumikura Advisory Committee Member
Japan Sewage Works Agency

Mr. Shozo Matsuura Coordinator of JICA

6. Topics of the Meeting

- (a) It was confirmed that the feasibility study for the first phase program will be carried out for the four cities, namely Zagazig, Bilbeis, Minyet El Qamh and Faqus, and that Abu Kebir city will not be included.
- (b) Information given by NOPWASD that the said organization is the sole authority responsible for the implementation of the sewerage project up to the commissioning of the facilities for the Sharqiya Governorate was confirmed. It was also agreed that descriptions regarding the organization system in the Interim Report would be modified according to the new information.
- (c) Comments on the Interim Report are now being prepared by NOPWASD, and the study team will receive them at the meeting with NOPWASD at 10:00 on 16 March. The study team requested the Governorate that representative(s) of the Governorate will attend the meeting. The counterpart staff of the Governorate accepted the request.
- (d) On the request by the study team, the Governorate engineer gave the land purchasing unit costs for two cities.
- (e) For the BOD concentration, it was confirmed that the study team would further investigate this item to be used for the design of treatment plant. The results will be presented in the Draft Final Report.
- (f) Opinions were exchanged about the water tariff increase during the present five year plan period. Although the increase is significant, it might be reasonable taking into account the income level of the inhabitants.
- (g) Water quality testing equipment were donated to the Governorate at the end of the meeting. A list of these equipment is herein attached.

For Sharqiya Governorate

A.K. Mowafy

Eng. Ahmed Kamel

For JICA Team

H. Makino

Eng. Heiichiro Makino

Witnessed

J. Yumikura

Mr. Jun-ichi Yumikura
JICA Advisory Committee

March 13, 1988

JAPAN INTERNATIONAL COOPERATION AGENCY

In connection with the field survey of the study on Sharqiya Sewerage System, the Sharqiya Governorate received the following equipment which were brought by the Study Team.

Those equipment will be used by the Governorate for further assessment in accordance with the regulation in the Governorate.

List of water quality equipment

No.	Description of goods	Quantity
1.	Stick-type thermometer	2
2.	Water temperature meter	1
3.	Transparency meter	2
4.	Portable pH meter	1
5.	Portable dissolved oxygen meter	1
6.	Portable conductivity meter	1
7.	Test paper for colitis genus	1
8.	Test paper for general bacteria	1
9.	Incubator	1
10.	Portable flow velocity meter	1

A.K. Mowafy

Eng. Ahmed Kameel
Manager of Potable Water and
Sewerage, Housing Department
Sharqiya Governorate

MINUTES OF THE SEVENTH OFFICIAL MEETING

ON
DRAFT FINAL REPORT

The seventh official meeting was held in the Planning Department office of the Sharqiya Governorate on 23rd August, 1988, to discuss the Draft Final Report. Mr. Shinoda opened the meeting with appreciation for the cooperation extended by the Governorate personnel during the course of the study. Mr. Makino followed and explained several changes made for the long term program. Messrs. Miyamoto and Takanashi explained briefly about the first phase program. Comments are mentioned on both long term program and the first phase program by Eng. Ahmed Kamel. Main issues discussed during the meeting are summarized below. A memorandum on the comments made by NOPWASD was delivered to the participants during the meeting, and it was agreed that the memorandum should be attached to this minutes of meeting. The meeting was concluded 2:00 pm.

1. Project: Feasibility Study on Sharqiya Sewerage System in the Arab Republic of Egypt.
2. Date: From 12:00 pm to 2:00 pm, 23rd August, 1988
3. Place: Planning Department Office, Sharqiya Governorate
4. Subject: Explanation and discussion of the Draft Final Report
5. Participants:

(a) Sharqiya Governorate

Eng. Ahmed Kamel Mohamed	Manager of Water Supply and Sewerage Housing Department
Eng. Fahmy Amin Shetawy	Manager of Utilities Zagazig City
Mr. Mohamed Hosny Hassan	General Manager Planning Department
Mr. Abdel Baset Abdel Aziz	Manager, Planning Department
Mr. Ibrahim Mahamoud Hassan	Chief of Protocol
Mr. Nabil Ibrahim Hassan	Economist Planning Department

(b) JICA Advisory Committee

Eng. Akira Yamane	Advisory Committee Member Housing and Urban Development Corporation
Eng. Yasuhiro Shinoda	Advisory Committee Member Arakawa Ward, Tokyo Metropole
Mr. Shozo Matsuura	Coordinator of JICA

(c) JICA Study Team

Eng. Heiichiro Makino	Team Leader
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Eng. Masafumi Miyamoto

Sewerage Facilities Planning

Mr. Hisashi Takanashi

Economist

6. Topics of the Meeting

- (a) Mr. Shinoda explained absence of the Chairman of the Advisory Committee, Mr. Tamaki who was supposed to attend the meeting. On behalf of Mr. Tamaki, he expressed appreciation of cooperation extended by the counterpart personnel during the course of the study. He also expressed the expectation of comments and suggestions from Egyptian participants at this meeting. He closed the address with his sincere hope for realization of the project and for efforts by Egyptian and Japanese persons concerned to achieve the goal.
- (b) Mr. Makino started with his appreciation of assistance given by the counterpart personnel. Then, he proceeded to explain the major changes in the long term plan. He mentioned that the reasons for increase of total project cost are i) expansion of service areas, ii) adoption of flow rates in 2040 for designing of trunk sewers, iii) higher BOD concentration in raw sewage, and iv) increase of unit land cost. He also made some correctios in the summary report. Two new tables which shall substitute for Table 1 on page 17 and Table 5.1 on page 39 were delivered.
- (c) Messrs. Miyamoto and Takanashi followed explainig the chapter five, firstphase program. No question was raised.
- (d) Eng. Ahmed Kamel mentioned several comments. Discussions and clarifications are as follows.

High cost

He pointed out that prices and costs are generally so high compared with those of construction presently carried out in the Governorate. The study team replied that unit costs of the elementary works such as concrete work and sewer pipe installation work were checked with information given by the Marakaz offices during the second on-site survey, and it was found that these are in good agreement. Therefore, the study team is of the opinion that their estimatioin is the most appropriate one at present. It was clarified that prices and costs of the materials and equipment which are not locally available have been assumed to be imported from Japan. This might be a reason for high price and costs.

Required staff number

Numbers of engineers and technicians in the Table 4.6 on page 4-29 of the main report are too few. Six engineers including one chief engineer and twelve technicians will be required in Cities and Village Sewerage and Drainage Section of the Governorate. This suggestion will be taken into account in the final report.

Infiltration rate

It was mentioned that infiltration rate of 10 m³/ha/day is too high. The study team replied that this figure is considered to be reasonable for the planning purpose considering those adopted for the sewerage planing for the other cities in Egypt of which geographical conditions are similar to those in the Sharqiya Governorate.

Correction of wording

The words "study area" at the bottom of Tables 3.5 on page 3-9 and 3.8 on page 3-13 are to be changed to "Sharqiya Governorate except for desert cities"

Reasons for no pumping station in Diarb Nigm

The governorate engineer asked the reasons for non existence of pumping station in Diarb Nigm sewerage system in Table 4.2 on page 4-7. The study team replied that topographic conditions in the city which are read on the map used for the master planning do not require pumping station.

Inlet depths of the pumping stations

It was mentioned that inlet depths of the pumping stations No.1 (9.3 m) and No.2 (6.2 m) in Zagazig, and No.1 (6.6 m) in Faqus are too deep, and that construction of these pumping stations is difficult because of the inadequate capability of local contractor. The study team replied that pumping stations were planned when the sewer pipes in general become about 5 m in depth, and that due to the localized topographic condition require inlet depths of more than 5 m for the three pumping stations. The study team considers that local contractors are capable of constructing these pumping stations, and that construction of the pumping station is beneficial for the total sewerage system.

Establishment of public water and wastewater company

Regarding organizational arrangement, referece was made to the comments given by NOPWASD (refer to paragraph 7 in attachment). Counterpart personnel fully agreed to the decision made by NOPWASD to establish new public water and wastewater companies on regional basis. It was suggested that this new information should be incorporated in section 4.4 of the main report. It was also suggested that this decision should be evaluated positively, since it is more appropriate way to manage sewerage system if the tariff rate is raised sufficiently enough to support financial independence of the company and if it can be established without time consuming efforts. These suggestions are to be properly reflected in the final report.

For Sahrqiya Governorate

A. Kamel

Eng. Ahmed Kamel

For JICA Study Team

H. Makino

Eng. Heiichiro Makino

Witnessed

A. Yamane

Eng. Akira Yamane

JICA Advisory Committee

COMMENTS ON THE DRAFT FINAL REPORT
FEASIBILITY STUDY ON SHARQIYA SEWERAGE SYSTEM

A meeting was held at the chairman's office of NOPWASD on 22nd August, 1988, to discuss the Draft Final Report of feasibility study on Sharqiya sewerage system. Meeting was attended by the following personnel. Comments were expressed by NOPWASD personnel, and discussions were held for the clarification. Major points of comments and clarifications are described below.

Date: From 13:00 to 15:00 pm, 22nd August, 1988

Place: Chairman's office of NOPWASD

Participants:

For NOPWASD

Eng. Mohamed Khalid Mostafa	Chairman, NOPWASD
Eng. Ahmed Hassan Khodeir	
Eng. Mohamed Negn El Din Mohamed	

For Sharqiya Governorate

Mr. Nabil Ibrahim Hassan	Planning Dept.
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For JICA

Mr. Akira Yamane	Advisory Committee Member
Mr. Yasuhiro Shinoda	Advisory Committee Member
Mr. Heiichiro Makino	Leader, Study Team
Mr. Masafumi Miyamoto	Study Team Member
Mr. Hisashi Takanashi	Study Team Member

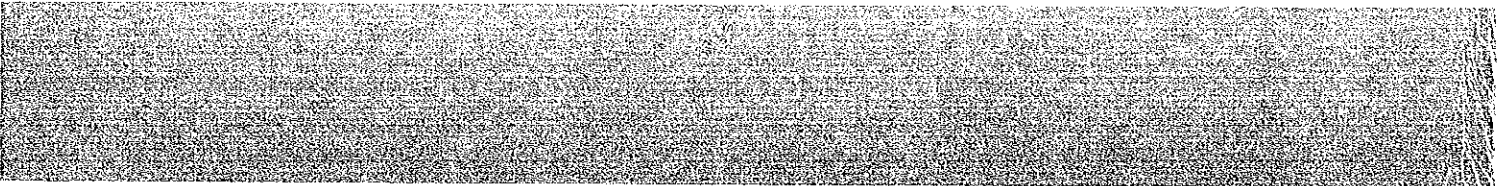
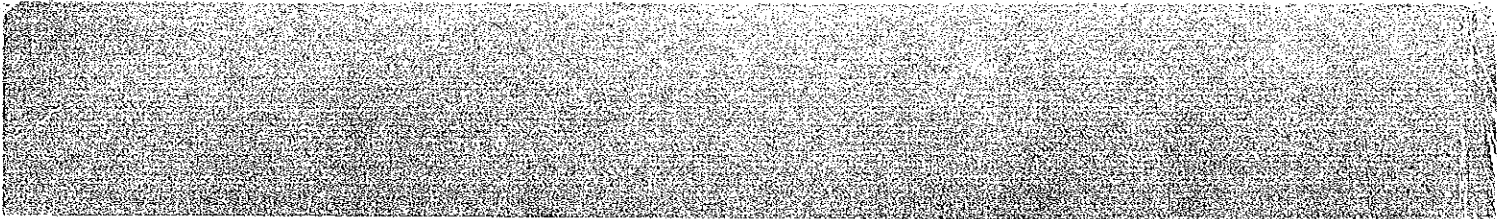
Comments and clarifications

Comments were expressed by NOPWASD according to the order of presentation in the summary report. Page numbers are, therefore, referred to those of the summary report.

1. The word "Israel" in Sinai peninsular on Fig. 1 on page vi is error, and to be deleted
2. Page 13, paragraph (f): The words "operation and maintenance of" should be added to the first sentence, because the Governorate's responsibility is limited to those function
3. Page 13, paragraph (g): The words "planning, construction and" should be deleted for the same reason mentioned in 2. above
4. Page 17, paragraph (d): A question was raised that BOD concentration of 450 mg/l as design parameter is low. Study team explained that this figure was estimated based on the results of water quality analysis carried out in the governorate, and that if increase of per capita loading as well as increase

of water consumption in the future is taken into account, BOD concentration of 450 mg/l is quite reasonable. The question was clarified

5. Page 24, paragraph (a): It was mentioned that NOPWASD came to the same conclusion to combine Qenayat sewerage system to that of Zagazig as recommended in the report.
6. Page 28, first paragraph: It was pointed out that engineering cost of 10 % of construction and rehabilitation costs is quite high compared with those practiced in Egypt. After some discussions, it was agreed that this figure should remain as it is for budgetary purpose.
7. Page 32, paragraphs (a) and (c): Chairman of NOPWASD expressed his preference to public water and wastewater company over expansion of the existing sewerage units in the governorate, since establishment of the public company is more advantageous from financial and managerial points of view and decision to establish such companies all over the provincial areas in Egypt on regional basis has been decided and announced by NOPWASD. He also suggested that these paragraphs be rewritten to reflect this decision. The study team explained their difficulties to incorporate this into the final report, since this information is quite new to them and revision of institutional arrangement and staffing schedule is required for incorporation. Intensive discussions were held how to deal with the NOPWASD decision in the final report. The study team proposed that reference will be made to the decision somewhere in the final report.
8. Page 33, paragraph (e): Last sentence should be modified to be read that sub-sections are only for operation and maintenance, and that central laboratory should be established under NOPWASD on the regional basis
9. Page 40, paragraph (b): Sewage flow from Qenayat should be added to the second sentence.
10. Page 47, paragraph (d): A part of local currency portion should be added to the grant assistance scheme.



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