

6. 収集資料リスト

主管部長	文書管理課長	主管課長	情報管理課長	技術情報課長	図書館受入日

プロジェクトID		調査団番号		調査団番号		調査の種類又は指導科目		発行機関		取扱区分		図書館記入欄	
地域	中東	調査団名又は専門家氏名	全国下水道整備計画調査事前調査	調査の種類又は指導科目	現地調査期間又は派遣期間	調査の種類又は指導科目	調査の種類又は指導科目	発行機関	取扱区分	図書館記入欄			
国名	シリア	配属機関名	住宅建設省	現地調査期間又は派遣期間	現地調査期間又は派遣期間	収集資料	専門家作成資料	発行機関	取扱区分	図書館記入欄			
資料の名称		形態(図書、ビデオ、地図、写真等)	収集資料	専門家作成資料	JICA作成資料	その他	発行機関	取扱区分	図書館記入欄				
A	法令・基準・統計資料												
A-1	Statistical Abstract 2005 Fifty eight Year	図書	*				Central Bureau of Statistics Office of prime Mister	①CR( ) SC					
A-2	SASMO 343 Safe reuse of the sludge	コピー	*				SASMO	①CR( ) SC					
A-3	SASMO 190 Drinking Water	コピー	*				SASMO	①CR( ) SC					
A-4	環境関連法(アラビア語/英語版)	CD(2枚)	*				MOLAE	①CR( ) SC					
B	開発計画関連資料												
B-1	National Environmental Strategy and Action Plan of Syria	図書	*				MOLAE/UNDP/WB	①CR( ) SC					
B-2	The Ninth, Five-Year Plan for Economic & Social Development Covering (2001-2005) in Syria	図書	*				Syria Government Department of Documentation	①CR( ) SC					
B-3	2005 SYRIA'S BUDGET-December 2004-	図書	*				Department of Documentation	①CR( ) SC					
B-4	REPORT on the 2005 SYRIA'S BUDGET-December 2004=	図書	*				Department of Documentation	①CR( ) SC					
C	報告書・技術資料												
C-1	Annual Records of Water Quality 2002-2003		*				Water Resources Information Center Ministry of Irrigation/JICA	①CR( ) SC					
C-2	MUNICIPAL ADMINISTRATION MODERNIZATION PROJECT IN SYRIA Identification Report (October 10, 2003)		*				PLANGROUP	①CR( ) SC					

主務部長	文庫管理部長	主査部長	情報管理部長	技術情報部長	図書館受入日

地域	中東	プロジェクトID	調査団番号	地球環境部第2グループ
国名	シリア	調査団名又は専門家氏名	調査の種類又は指導科目	地球環境部第2グループ
		配属機関名	現地調査期間又は派遣期間	担当部署
		住宅建設省	17年10月2日～17年10月26日	担当氏名
				柿岡 直樹

番号	資料の名称	形態図書、ビデオ、地図、写真等	収集資料	専門家作成資料	JICA作成資料	冊数	発行機関	取扱区分	図書館記入欄
C-3	Summary of Investment Portfolio required to be implemented during the 2006-2010 to ameliorate conditions of maritime environment of Syria and to protect it from land-based pollution		*				MOLAE	①CR ( ) SC	
C-4	The Mediterranean Action Plan (MAP)	図書	*				UNDP	①CR ( ) SC	
D	下水道関係の報告書・技術資料・図面								
D-1	Wastewater Strategic Planning and Priority Investment Study in Barada & Ghouta Gharbiyah Final Report Volume 1: Executive Summary February 2003	図書	*				The World Bank/Ministry of Housing & Utilities	①CR ( ) SC	
D-2	Wastewater Strategic Planning and Priority Investment Study in Barada & Ghouta Gharbiyah Final Report Volume 2: Strategic Plan February 2003	図書	*				The World Bank/Ministry of Housing & Utilities	①CR ( ) SC	
D-3	Wastewater Strategic Planning and Priority Investment Study in Barada & Ghouta Gharbiyah Final Report Volume 3: Priority Projects February 2003	図書	*				The World Bank/Ministry of Housing & Utilities	①CR ( ) SC	
D-4	Wastewater Strategic Planning and Priority Investment Study in Barada & Ghouta Gharbiyah Final Report Volume 4: APPENDICES February 2003	図書	*				The World Bank/Ministry of Housing & Utilities	①CR ( ) SC	
D-5	The Status of wastewater in Daraa Governorate	図書	*				Ministry of Local Administration Daraa Governorate	①CR ( ) SC	
D-6	タルトゥース県 下水マスタープラン要約版 (アラビア語)	コピー	*				MHC/GECC	①CR ( ) SC	
D-7	タルトゥース県 下水マスタープラン図面 (アラビア語)	コピー	*				MHC/GECC	①CR ( ) SC	
D-8	タルトゥース県 汚染井戸位置図面 (アラビア語)	コピー	*				Establishment of Water Supply and Sewage	①CR ( ) SC	

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プロジェクトID	調査団番号	調査の種類又は指導科目	担当部署	地球環境部第2グループ
中東	調査団名又は専門家氏名	全国下水道整備計画調査事前調査	担当部署	
シリア	配属機関名	住宅建設省	担当者氏名	柿岡 直樹
		現地調査期間又は派遣期間		
		17年10月2日～17年10月26日		

番号	資料の名称	形態(図書、ビデオ、地図、写真等)	収集資料	専門家作成資料	JICA作成資料	社外	発行機関	取扱区分	図書館記入欄
D-9	タルトゥース市 下水幹線網図面 (アラビア語)	コピー	*				Establishment of Water Supply and Sewage	CR ( ) SC	
D-10	タルトゥース市 下水処理場及び下水幹線網計画図面 (アラビア語)	コピー	*				Establishment of Water Supply and Sewage	CR ( ) SC	
D-11	Zabadani Pre-feasibility Study (英語)	CD	*				EIB	CR ( ) SC	
D-12	下水マスタープラン報告書 (Homs, Hama, Idleb) (アラビア語)	CD	*				MHC/GECC	CR ( ) SC	
E	地図								
E-1	SPACE IMAGE ATLAS, SYRIA	図書	*				GORS	CR ( ) SC	
E-2	Syria (Damascus-Aleppo-Palmyra)	図書	*				Syria Tourism	CR ( ) SC	
E-3	Syria (Damascus and Damascus Countryside)	図書	*				Syria Tourism	CR ( ) SC	
E-4	Syria (Dara'a-Sweida-Quneitra)	図書	*				Syria Tourism	CR ( ) SC	
E-5	Syria (Ar' Raqqa-Deir Ez-Zor Al-Hasakeh)	図書	*				Syria Tourism	CR ( ) SC	
E-6	Syria (The COAST)	図書	*				Syria Tourism	CR ( ) SC	
E-7	Hydrological Basins and Dams in Syria	図書	*				水資源センタープロジェクト	CR ( ) SC	
F	質問票回答	図書	*					CR ( ) SC	

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プロジェクトID	調査団番号	地球環境部第2グループ
地域	調査の種類又は指導科目	開発調査(事前評価調査)
中東	調査団名又は専門家氏名	担当部課
シリア	配属機関名	住宅建設省
	調査期間又は派遣期間	17年10月2日～17年10月26日
	現地調査期間又は派遣期間	担当者氏名
		柿岡 直樹

番号	資料の名称	形態(図書、ビデオ、地図、写真等)	収集資料	専門家作成資料	JICA作成資料	ネット	発行機関	取扱区分	図書館記入欄
F-1	住宅建設省の質問票回答	図書	*				MHC	①・CR( )・SC	
F-2	地方行政環境省の質問票回答	図書	*				MOLAE	①・CR( )・SC	
F-3	工業省の質問票回答	図書	*				MOI	①・CR( )・SC	
F-4	ダマスカスルーラル上下水道公社の質問票回答	図書	*				ダマスカスルーラル上下水道公社	①・CR( )・SC	
F-5	ダラア上下水道公社の質問票回答	図書	*				ダラア上下水道公社	①・CR( )・SC	
F-6	タルトゥース上下水道公社の質問票回答	図書	*				タルトゥース上下水道公社	①・CR( )・SC	
F-7	ラキア下水道公社の質問票回答	図書	*				アタキア下水道公社	①・CR( )・SC	
F-8	ラッカ上下水道公社の質問票回答	図書	*				ラッカ上下水道公社	①・CR( )・SC	
F-9	ディエルゾール上下水道公社の質問票回答	図書	*				ディエルゾール上下水道公社	①・CR( )・SC	
G	ローカルコンサルタント資料								
G-1	General Company for Engineering & Consulting会社概要	図書	*				GECC	①・CR( )・SC	
G-2	Consultants for Quality & Technology (CQT)会社概要	図書	*				CQT	①・CR( )・SC	
		図書	*					①・CR( )・SC	
		図書	*					①・CR( )・SC	

## 7. ローカルコンサルタントリスト

現地再委託業務（エンジニアリングサービス、社会調査、環境影響調査、地形測量、土質調、水質分析）に関し、ローカルコンサルタントについて調査した結果は以下のとおり。

### (1) シリア国の民間コンサルタントの状況

シリア国では政府系の公社が、エンジニアリング・コンサルティング業務の多くを独占している。国内業務の民間コンサルタントへの発注量が限られているため、まだ大きな会社として成長したコンサルタント会社は存在しない。しかしながら、外国のドナー援助業務は、外国のコンサルタントと JV あるいはアウトソーシングで行っており、政府の競争原理の導入原則もあって、今後成長が期待できるものと思われる。

政府系の技術コンサルタント会社としては、GCEC (General Company for Engineering and Consulting) が、下水道のマスタープランの作成や下水処理場の設計を行っており、本来ならば活用すべきであるが、住宅建設省との関係が極めて険悪である。住宅建設省の評価では、政府系であるがため仕事が遅く、成果品にも間違いが多く、旧ソ連型の硬直した画一的な計画をする志向があり、柔軟性に欠けるとしているため、本事前調査においては、再委託ローカルコンサルタントのリストから除外した。

参考見積もりの徴収にあたっては、カウンターパートである住宅建設省の推薦で、① CQT, Consultants for Quality and Technology (Dr. Nidal Al Cheikh Kassem)、② Safadi Bureau (Eng. Housam Safadi)、③ Unit for Sanitary and Environment Protection Projects (Dr. Eng. George Zahr)、④ Kh. Ayash Sanitary Engineering Consultant (Dr. Eng. Khalil Ayash)、の4社から行った。

上記4社の内、会社として外国のドナーとの業務経験があるのは、①のCQTだけで、他の3社は個人としての参加実績はあるが、会社としての実績はまだない。一方、CQTはGTZのみならずJICA 開発調査（開発調査：廃棄物、総合交通）の業務経験もあり、シリア国で数少ない外国援助プロジェクトの実績があるコンサルタント会社である。

上記4社のインタビュー調査ならびに参考見積書の分析から、実際に本格調査に際し、会社として4地域の業務（3チーム編成）を同時に実施するマネジメント能力があるのは、CQT社のみと判断される。残る3社は基本的にアソシエーション形式の会社であり、会社としてのマネジメント能力には疑問があるが、技術者の供給は可能であり、JVの構成員とは十分に成り得る。特に、Safadi Bureau社は、元住宅建設大臣のEng. Housam SafadiがDirectorをしており、シリア国内の上下水道業界において、豊富な情報源と人脈を有している。

### (2) ローカルコンサルタントリスト

#### ① CQT, Consultants for Quality and Technology

住所：P.O. Box: 6346, Damascus Syria

電話：+693-11-6812239（携帯）+963-93-26397

Fax : +693-11-6812239

E-mail ID : cqf@scs-net.org

面談者 : Dr. Nidal Al Cheikh Kassem, General Managing

特徴 : GTZ のみならず JICA 開発調査 (開発調査 : 廃棄物、総合交通) の業務経験もあり、シリア国で数少ない外国援助プロジェクトの実績があるコンサルタント会社である。

② Safadi Bureau

住所 : P.O. Box 7526, Damascus Syria

電話 : +963-11-3324208, +963-11-5120197 (携帯) +963-93-210263

Fax : +963-11-3341698

E-mail ID : hsafadi@scs-net.org

面談者 : Eng. Housam Safadi, Director of Bureau

特徴 : 元住宅建設大臣の Eng. Housam Safadi が Director をしており、シリア国内の上下水道業界において、豊富な情報源と人脈を有している。

③ . Unit for Sanitary and Environment Protection Projects

住所 : Faculty of Civil Engineering, Damascus University

電話 : +963-93-264556

Fax: +963-11-5430442

E-mail ID : g-zahr@lscs-net.org

面談者 : Dr. Eng. George Zahr,

特徴 : ダマスカス大学土木工学科の講師をしている、Dr. Eng. George Zahr が率いる技術グループで、アソシエーション形式の組織である。個人としてはドイツで、環境・下水道関連のプロジェクト経験がある。

④ Kh. Ayash Sanitary Engineering Consultant

住所 :

電話 : +963-11-6113642 (携帯) +963-093-215328

E-mail ID : khayash@lscs-net.org

面談者 : . Dr. Eng. Khalil Ayash

特徴 : Dr. Eng. Khalil Ayash は、元ダマスカス下水道公社総裁をしていた技術者で、アソシエーション形式のコンサルタント会社である。エジプトのコンサルタント会社 (Chemonics 社) と提携している。

8. 国営企業の廃水処理状況リスト

1. セメント及び建設資材産業

The General Establishment for Cement and Construction Materials					
Company	Address	Activity	Outline of Treatment Plant	Other existed treatment methods	Discharged wastes
The Arab Company for cement and Construction Materials	South Aleppo City	Producing Portland Cement	The industrial water circuits is completely closed. There is a treatment plant of good function.	There are two precipitation basins working alternatively to isolate oils, fat, fuel...	Into Aleppo sanitary drainage(complex K) that ends at Aleppo treatment plant.
Tartous Company for Cement and Construction Materials	10 Km north Tartous	Producing Portland Cement			
Al Shaha Company for Cement and Construction Materials	Aleppo- Baron Street	Producing Portland Cement and Sulfate resisting cement	Closed Circuits- No treatment plant	Nets for foreign materials using water cooling method	Queik river
Al Maslamieh Factory			No treatment station	Precipitation basin	Queik river
Al Sheikh Saeed Factory			Not existed. Circuits is closed industrial	In some refrigerating circuits points there are net for foreign materials.	Sewage water or irrigating forester trees surrounding the company
Adra Company for Cement and Construction Materials Industry	26 Km North Eastern Damascus -beside Adra	Producing Portland Natural Gases			Into Hama, then to Orantos river with Kafr Baham and silos wastes
The Syrian Company for Cement and Construction Materials Industry	8 Km South Western Hama Near Kafr Baham	Producing Portland Cement and Sulfate resisting cement	Not Existed. The circuit is industrial and closed. A treatment plant will be established for the three lines and new third line will be implemented.	Nets are existed in factory No.2	
Al Rastan Company for Cement and Construction Materials Industry	East Rastan- North to Homs	Producing Portland Cement of high resistance	The water is reused in mixing raw materials. The company uses the wet method.		Not discharged
The National Company for Cement and Construction Materials Industry	Damascus- Dumar	Producing plates and cement pipes	Cement furnaces lines are not existed. Suspended since 1988	A (1km) ravine is available for the precipitation of foreign materials, thus all of the industrial water become dry by the evaporation effect.	Out of the company then to public drain.
Aleppo Company for	Aleppo- Sheikh Saeed	Cement pipes	Not Existed	Well functioned	River Queik- Free from

Amainthus Products	Cement					precipitation lakes to release water from cement powder	Cement materials.
The Arab Porcelain Products	Company for Sanitary Products	South Hama- 9KM	Sanitary Porcelain suspended since Sep.2004	products. Production since	A precipitation unit (ss) well function.		Out door, around the company

## 2. 砂糖産業

General Establishment for Sugar							
Name	address	Activity	Outline of treatment plant if available	Discharge its liquid wastes to			
Homs Sugar Factory	Hama road	Sugar Manufacturing (refinement), Manufacturing vegetable oil, soap, baker's yeast, and medical and industrial alcohol	The company has no treatment station. It depends on Adweir station in Homs as 3 basins are allocated for the company. The company is studying establishing its own treatment station. Now it is implementing experiments on trial unit presented by the studying party (AL bath university) and the examiner party (The general company for technical constancies).	The liquid wastes of the company are discharged in the allocated basins in the treatment station of Adweir			
Tal Salhab Company	Hama- Tal Slahab	Producing white sugar and sugar beet.	Its discharges are divided into two parts: 1-water that are not discharged to Orantos River but to special basins of the company. 2- water discharged to Orantos River.	No treatment station			
Al Ghab company	Idleb- Ashughour	Producing white sugar by refining red sugar	No treatment station. Establishing a station will be considered in the coming 5 years plan.	In Orantos river.			
Maskaneh Company	Aleppo- Raqqa road- Maskaneh (80 Km from Aleppo).	No treatment station	No treatment station	1- Precipitation basins out of the company. 2- The basins' surplus goes to state farms drainage system.			
Arraqa Company	Arraqa- Abiyad (7 Km from Arraqa)	Producing white sugar from sugar beet.	No treatment station	It discharges its wastes in Euphrates river.			
Deir-Ezzor Company	Deir-Ezzor- Al Hassakeh road -7 km-	Producing sugar from sugar beet.	No Treatment Station	Euphrates river			
Aleppo Company	Aleppo- Salamieh road-	Producing dry yeast and baker's yeast	No Treatment Station	In the public drain			



Damascus company yeast	Beside Al -Awijeh Village Damascus-Airport road	Producing soft baker's yeast	A treatment station for liquid wastes is working by the active muddy method. It needs to be up graded so that the discharged water can meet the Syrian standard for using treated water for irrigation	In seasonal river ,4.5 Km from the factory through concrete channels.
Harasta company yeast	Rural Damascus-Irbeen road	Producing soft Baker's yeast	Not existed	In the public drainage of Harasta

### 3. 製品製造産業

#### General Establishment for Engineering Industries Industrial Liquid Wastes

Company	Address	Activity	Outline of treatment plant	Liquid wastes discharged to:
General Aluminum industries	Lattakia- Aleppo road -Tel: 425800	Producing different Aluminum Sections	Existed - The feasibility of oxidization is 40%	The public drainage
Aleppo Cable Manufacturing Company	Aleppo -Safira road	Producing cables ,tapes and bared hawsers	Unavailable	Filtered wells.
General Company for Iron and Steel Products	Hama- Kamhaneh	Iron Industry	Available and it is effective	The Floating Oils sent back for refining and re-use.
The Arab Company for Wood Industry	Lattakia	Wood	Not available	The stream of Al Kabir Al-Shamali River
The General Company for Electric Engines Industry	Lattakia- Aleppo road	Different electric engines	Not available	The general net- Al- Kabir Al Shamali river-Sea
The Syrian Company for Batteries and liquid gases	Aleppo- Asfirah road	Cars' Lead Batteries Industry	Not available	Special holes
The Syrian Arab Company for Electronic Industries	Damascus- Al Qaboun	Manufacturing TV sets	Not available	Sanitary drainage
The General Company for Matches and Pressed Wood	East Ghouta- Mleina road	Producing Matches, pressed wood and pencils	Not available	Barada River
The General Company for Cables industry in Damascus	Damascus- Housh Blas	Producing isolated cables and bared hawsers	Not available	Not available
The General Company for Iron Industry /Barada/	Damascus- Al kadam - Sbeineh Al Sughra. Tel: 8217535	Producing Household devices - refrigerators - ovens - automatic washing machines- pressure cooker	A gathering and pumping plant is available in the company	A drain leads to agricultural lands out of te company.
Dry Batteries Company (Al Kadam)	Kadam- Dahadeel	Producing saline and alkaline batteries.	Not available	The general drain.

The General Company for Transmuted Industries	Damascus -Housh Blas	Producing paper products and sanitary towels	Not available	The general drain.
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#### 4. 絨維產業

Ministry of Industry -- The General Company for Textile Industries						
Governorate	Serial No.	Company	Address	Activity	Outline of treatment plant	Discharged to:
Damascus	1	The united Commercial Industrial Company	Damascus- Al Kaboun	Manufacturing textile, dyeing and printing	Old precipitation basins are available to treat dyeing water. Booklet of conditions is under preparation.	The river beside the company.
	2	The united Arab Company for Industry	Damascus- Housh Blas	Producing cotton clothes for dyeing and printing	Not available- A contract was signed but still not approved as there is no action plan.	Sbeineh Channel
	3	The General Company for Spinning and weaving	Damascus- Kaboun	Manufacturing textile, dyeing and printing	A treatment plant will be implemented soon	City sanitary drainage
	4	The Industrial Company for Nylon Strings and Socks	Damascus- Ghouta- Mleiha Road	Producing Satin yarns, socks and dyeing polyester and nylon yarn	Not available	The river beside the company
	5	The Modern Industries Company	Damascus- Mleiha Road	Wool and mixed clothes- Weaving- Textile- printing	Old acceptable treatment plant	River
	6	The General Company for Carpets. Damascus Factory Suweida Factory	Damascus- Housh Blas Suweida/ Mukwas	Wool Carpets	Not available	City sanitary drainage
	7	Orient Company for Underwear	Qazzaz- Saiyda Zainab Road	Tricot and underwear	Not available	City sanitary drainage
	8	The Syrian Company for Ready Garments	Damascus- East Ghouta- Mleiha Road	Ready garments	Not available	River
	9	Al Waleed Spinning Company	Homs- Industrial Area	Producing cotton and mixed yarns	Not available	River
Homs	10	Homs Company for Spinning, Textile and Dying	Homs Al Mimas Road	Weaving- spinning- dyeing and printing	Old acceptable treatment plant	City sanitary drainage

Governorate	Serial No.	Company	Address	Activity	Outline of treatment plant	Discharged to:
Hama	11	Hama Company for Cotton Yarns	Hama- Homs Road	Manufacturing cotton yarns	Not available as there are no industrial wastes	City sanitary drainage
	12	The General Company for Wool	Hama- Homs Road	Wool Washing, weaving and dyeing	A treatment plant is existed and is under operation and trial	City sanitary drainage
Aleppo	13	The General Civil company for Yarn and Textile	Aleppo-Belleramoun	Producing different yarns and mixed clothes	Not Available	City sanitary drainage
	14	The Syrian Company for Weaving and Textile	Aleppo- Ein Al Tal	Manufacturing yarns, textile, dyeing and printing	The company contracted to establish treatment plant	City sanitary drainage
	15	Al Shahbaa Company for Weaving and Textile	Aleppo- Ein Al Tal	Weaving and spinning	Not Available	City sanitary drainage
	16	The industrial Company for Garments	Aleppo- Ein Al Tal	Manufacturing garments	Not Available	City sanitary drainage
Idleb	17	The Arab Company for Underwear	Aleppo- Ein Al Tal Beside The Industrial Company for Garments	Manufacturing and dyeing tricot and underwear	Not Available	City sanitary drainage
	18	Aleppo Silk Company/SATEX	Aleppo- Ein Al Tal Beside Al Kindi Hospital	Wool Carpets, Cotton and mixed clothes, dyeing	Not Available	City sanitary drainage
	19	The General Company for Cotton Yarn in Idleb	Idleb- Sermin Old Raod	Producing cotton yarns	Not Available	City sanitary drainage
	20	Idleb Weaving Company	Idleb- Sermin Old Raod	Producing cotton yarns- Turbine	Not Available	City sanitary drainage
Lattakia	21	The General Company for Cotton Yarns in Lattakia	Lattakia- Wata Al Baslees	Producing cotton yarns	Sewage treatment plant is available- uncovered	Treated water discharged into the river
	22	Lattakia Textile Company	Lattakia - Al Arabia Village	Producing Raw Cotton Clothes	Sewage treatment plant is available- uncovered	Treated water discharged into the river
Tartous	23	Jableh Modern Company of Weaving	Lattakia - Jableh	Producing cotton yarns	A new covered treatment plant is existed and is working effectively	General drain
	24	Natural Silk Company in	Tartous- Dreikish	Producing Raw Silk	No wastes, only washing	Water ravine

Governorate	Serial No.	Company	Address	Activity	Outline of treatment plant	Discharged to:
		Dreikish				
Deir-Ezzor	25	Al Furat Weaving Company	Deir-Ezzor	Producing cotton yarns	water- No treatment plant A treatment plant of 50% efficiency is existed	To drainage channels
Al Hassakeh	26	Al Hasakeh Weaving Project	Al Aziziya- Al Hawl Road	Producing cotton yarns	Not available	Khabour river and could be transferred to city sanitary drainage when it is ready

### 5. 食品工業

#### The General Establishment for Food Industries

Company	Address	Activity	Outline of Treatment Plant	Discharged Wastes
The modern Company for Preserves and Agricultural Industries	Damascus- Meilha Road	Different Preserves	Not Existed	Sanitary Drainage network
The Arab Company for Dairy Products.	Damascus- Bab Sharqi- Ghouta Road	Sterilized milk -Yogurt- Cheese- Ghee-Butter	No treatment in the company	In sanitary drainage of Damascus.
Barada Company for Beer Production	Damascus- Al Hameh	Beer	A plant for treating water physically, chemically and bacterial is available	In the public drain
Damascus Company for Food Industries (Camiya)	Damascus- Al Yarmouk Camp- Palestine Street.	Biscuits	Not Existed	In the public drain
The Syrian Company for Biscuits (Ghraoui)	Damascus- housh blas	Biscuits	Not Existed	In the public drain
Boukein Water Filling company	Zabadani road	Filling mineral water and carbonated beverages.	Not Existed	In the sanitary drainage circle in the area
Dreikish Water Filling Company	Dreikish	Water	Not Existed	In the public drain
Oil and Soap Company	Damascus- Jaramana Road	Soap products	Not Existed	In the public drain- it doesn't discharge in the sanitary drainage
Hama Oil Company	Hama- Mehardeh road	Squeezing Cotton Seeds	A good plant is available	In the sanitary drainage network
Al Yarmouk Company for Macaroni and Vermicelli Production	Daraá- Bosra Sham Road	Macaroni+ Vermicelli	Not Existed	No wastes

Onion and vegetables drying Company	Salamieh-Hama	Dry Onion+ Crushed wheat	The plant was constructed and under experiencing	The discharged quantity is used to irrigate the trees within the company. If it proofs success, it will be discharged into the sanitary drainage
Hom Dairy Company	Homs- Industrial Area	Dairy Products	Not Existed	The public drain except cheese whey
Homs Company for Grape Industry	Homs- Zaidal	Al -Cohol Drinks(Arak-Wine)	A plant for treating juice distillation outputs is existed	In public drain
The Syrian Arab Company for Grape Industry	Al Suweida- Koum al Homs	Al Cohol Drinks	A plant is under execution	Into natural waterway
Al Sharq Company for Food Products	Aleppo- Ein Al Tal	Dairy products	Not Existed	Into sanitary drainage
Aleppo Oil Company 1- Al Nairab Factory 2- Ein Al Tal Factory 3- Allairamoun Factory	Aleppo- Midan	Beer- Biscuits	Not existed	Into sanitary drainage
	Beside civil airport	Cotton seeds production	No treatment plants but precipitation basins to isolate stains without chemical treatment for the sewage water.	Into Aleppo sanitary drainage
	Ein Al Tal- Al Maslamieh	Cotton seeds production	No treatment plants but precipitation basins to treat domestic water.	Into Aleppo sanitary drainage
Idleb Preserves Unit	Ezaz road- Hreitan	Cotton seeds preparation	Not existed	Into Aleppo sanitary drainage
	Idleb	Different preserves production	Not existed	
Al Hasakeh preserves Unit	Deir Ezzor road	Canning vegetables and fruits	Not existed	Into sanitary drainage
Al Mayadeen Preserves Unit	Al Mayadeen	Producing Canned Food		No liquid wastes resulted from the used raw materials
Amreet Beer	Tartous	Not existed	Not Existed	

9. 事前評価表

事業評価 G 長	テーマ別評価 T 長	係	担当 G 長	担当 T 長	担当者

事業事前評価表（開発調査）

作成日：平成 18 年 1 月 12 日

担当グループ：地球環境部第二グループ

1. 案件名	シリア国全国下水道整備計画策定調査
2. 協力概要	<p>(1) 事業の目的 生活環境衛生の向上、水資源の汚濁防止、処理水の灌漑利用を目的とした下水道及び下水処理施設を整備するために、全国 14 県のうち 7 県を対象に既計画地域のマスタープラン(M/P)のレビュー及び未計画地域の M/P の作成を行い、これら M/P の事業計画から緊急性・インパクトを考慮して選ぶ優先事業についてフィージビリティスタディー (F/S) を実施する。</p> <p>(2) 調査期間 16 ヶ月</p> <p>(3) 総調査費用 2.8 億円</p> <p>(4) 協力相手先機関 住宅建設省下水道局</p> <p>(5) 計画の対象（対象分野、対象規模等）</p> <p>(a)調査対象： フェーズⅠ：シリア国全土 フェーズⅡ： シリア国全国 14 県のうち優先 4 地域の 7 県（地下水または湧水が上水源で下水による井戸やダム水の汚染が起きている地域及び河岸沿いに都市人口が増加し水質汚濁が生じている地域） （優先地域） （県） ダマスカス郊外 ダマスカス郊外県 海岸地域 タルトゥス県、ラタキア県 ダラア ダラア県 ユーフラテス川流域 ハサケ県、ディエルゾール県、ラッカ県 フェーズⅢ：ダマスカス郊外県</p> <p>(b)対象面積・人口：18.5 万 km<sup>2</sup>、約 1820 万人（シリア全国 2004 年推定）</p> <p>(c)対象分野：下水道施設整備</p>
3. 協力の必要性・位置付け	<p>(1) 現状及び問題点 地中海に短い海岸線を持つシリア国は、国土の大半が標高 200～1,000m の砂漠台地であり、降水量が少なく水資源に乏しい国である。水資源はユーフラテス川流域を除き井戸水や湧水に依存している。降水量の多くが冬期に集中しており、夏期は渇水で水不足は深刻な状況にある。都市部では地方からの人口流入が続き、人口が急増しており、生活用水、工業用水、農業用水等が不足している。特に、農業は夏季に大量の水が必要となるが、地下水位の低下もあり、水の確保に苦心している。やむを得ず、生活排水を灌漑に利用する農民もいる。 シリア国では下水道整備は端緒についたばかりであり、下水処理場を有する都市は人口の大きな 4 つの都市（ダマスカス、アレッポ、ホムス、ハマ）のみである。下水道は整備されているものの下水処理場のない都市はまだ多い。地方の小規模な市町村では下水道すらないところも多い。下水処理がなされていない地域では、生活環境衛生が悪く、井戸水や上水ダム水の汚</p>

染が進行しており、井戸の閉鎖やダム水の上水供給の中止も発生している。オリーブオイル工場などの工場廃水が未処理のところも多く、これも水質汚濁の原因になっている。下水道が整備されているところでも、下水管や継ぎ目の施工不良により漏水が起きて、上水道への混入、汚染の問題が発生することもある。

シリア国政府は、地方自治・環境省及び住宅・建設省を中心として、水環境の問題に取り組んでおり、前者は市町村の下水道整備に対する補助、後者は下水道整備基本計画策定、広域下水道ネットワーク整備、下水処理場の整備を所掌している。シリア国政府は第10次5ヶ年計画（2006年～2010年）を策定中だが、水分野では上水の供給率が100%近くなり、今後は水資源の汚濁防止、水損失の削減、コストリカバリーに重点を置く考えで、下水道分野については大幅に予算を増加させる方針である。シリア国では、人口5,000人未満の村落も含めて、全国で4,400箇所以上の下水道及び下水処理場の整備計画が必要とされている。住宅・建設省は全国に14ある県ごとの下水道整備マスタープラン(M/P)水道及び下水処理場の整備を進めていく計画である。すでに9県が政府系公社あるいは大学に委託してM/Pを作成済みであるが、設計基準が古いもので政府が輸入する下水処理場の電気・機械設備にマッチしない、人口予測など社会経済フレームの将来計画が現実と合わなくなっているなどの問題が生じており、住宅・建設省ではM/Pのレビューが必須になっている。また、まだM/Pの作成されていない5県では新規にM/Pの作成が必要になっている。一部の地域では世界銀行、欧州投資銀行（European Investment Bank: EIB）、スペインの援助、あるいは自己資金により、下水処理場建設の計画が進行中である。

下水道及び下水処理場の整備と併せて工場廃水の前処理も必要であり、首都ダマスカスの郊外では下水処理場のある工業団地を整備して、工場をそこへ移転させる計画がある。下水道を分流式にして工場廃水や雨水などを公共下水道に入れられないようにする計画も必要である。

シリア国内の下水道及び下水処理の技術者は人数、知識・経験とも不足で、現代の先進的な下水処理技術に基づくM/Pを策定することができない。

#### (2) 相手国政府国家政策上の位置づけ

シリア国政府は現在第10次5カ年計画（2006～2010年）を策定中である。水分野では第9次5カ年計画（2001～2005年）において、水供給率の増加を目標に掲げ（給水人口88%? 96%）、大幅に向上したことから、第10次5カ年計画においては水質汚濁防止に重点が置かれる方針であり、優先投資のひとつに下水道の普及、下水処理場の増設が検討されている。同計画においては下水道分野の政府予算が大幅に増加する見通しである。

#### (3) 他国機関の関連事業との整合性

主要都市を中心に、世界銀行、EIB、スペイン、クウェート基金が個別の市町村の下水処理施設の設計調査や建設に資金協力を行っている。また、ダマスカス郊外県では、EUが国連パレスチナ難民救済事業機関(United Nations Relief and Works Agency: UNRWA)の難民キャンプおよびその周辺集落の下水道インフラを支援しており、EIBとマレーシア政府が下水処理施設の建設を計画している。一方、ドイツ政府は、水セクターの組織制度改革支援に関する包括的な技術協力プログラムを2006年1月から開始する予定である。日本の調査では他ドナーのプロジェクトの計画を調査して既存計画としてM/Pに織り込むとともに、F/Sの対象プロジェクトには重複しないサイトを選定する。

#### (4) 我が国援助政策との関連、JICA 国別事業実施計画上の位置づけ

JICA 国別事業実施計画における援助重点分野の一つである「環境保全」の開発課題として都市環境改善が取り上げられ、「下水処理システムの改善」プログラムが計画されている。

### 4. 協力の枠組み

#### (1) 調査項目

##### 1. 下水道セクターの既存計画のレビュー

##### 1. 関連既存調査・資料のレビュー

- (1) 下水道計画及び関連下水道整備プロジェクト
- (2) 河川流域・沿岸の水環境管理
- (3) 工場廃水排出規制
- (4) 灌漑の処理水再利用
- (5) 水質汚染対策の法制度
2. 既存下水道計画の評価と提言
  - (1) 法制度
  - (2) 組織
  - (3) 投資計画
  - (4) 下水道事業の経営・財務
- II. 優先度の高い地域におけるマスタープランの策定
  1. 既存データ・資料の収集、分析
    - (1) 自然、社会・経済、環境状況
    - (2) 土地利用、インフラストラクチャー
    - (3) 関連開発計画・プロジェクト
    - (4) 上水道・灌漑
    - (5) 水質汚染源のインベントリー
    - (6) 環境関連法規、組織
    - (7) その他関連資料・情報
  2. 下水道の現況調査
  3. 汚染水源及び高濃度工場廃水の水質分析
  4. 小都市・村落下水道データベースの作成
  5. 技術的代替案の検討
    - (1) 集中下水道システムと分散型小規模下水道システム
    - (2) 下水処理法
  6. 開発戦略ならびにマスタープランの策定
    - (1) 計画フレームの予測
    - (2) 基本方針と計画諸元の設定
    - (3) 下水道整備計画ならびに処理水再利用計画の策定
    - (4) 業種別高濃度工場廃水処理法の提言
    - (5) 下水道事業体の経営能力強化に係る提言
    - (6) 概算事業費の算定
    - (7) 段階的整備計画の策定
  7. 環境社会配慮
  8. 今後の日本国の援助プログラムの提案
  9. マスタープランの事業評価
- III. パイロットプロジェクトのフィージビリティ調査
  1. F/S対象パイロットプロジェクトの選定（対象地：ダマスカス郊外県、研修訓練も兼ねる）
  2. 補足調査（必要に応じて）
    - (1) 地形測量・土質調査
    - (2) 社会調査
    - (3) 水質分析
  3. 下水処理場を含む下水道施設の概略設計
  4. 施工計画・資機材調達計画
  5. 運営維持管理計画
    - (1) 組織
    - (2) 人材育成（トレーニング）
    - (3) 運転維持管理指針
    - (4) 広報活動



6. 概算事業費積算
7. プロジェクトの財務計画と経済評価
  - (1) コストリカバリーの目標水準
  - (2) 下水道料金体系
8. 環境社会配慮
9. 事業実施計画の策定
10. 事業実施に向けての提言
11. 技術移転セミナーの開催

(2) アウトプット (成果)

- ・ 全国レベルでの下水道分野の戦略、投資計画、組織制度、財務改善の提案
- ・ 4地域7県の下水道整備に係る M/P
- ・ ダマスカス郊外県におけるパイロットプロジェクトの F/S 調査報告

(3) インプット (投入) : 以下の投入による調査の実施

(a) コンサルタント (分野/人数)

総括/下水道計画	1名	セクター開発戦略/法制度	1名
下水処理場計画/水質分析	1名	下水道施設設計	1名
工場廃水処理計画	1名	流域水環境管理	1名
機械電気設備設計/積算	1名	財務計画/組織・事業経営	1名
環境社会配慮/村落調査	1名	システムエンジニア (GISデータベース)	1名

(b) その他

- ・ 研修員受入れ (下水道管理等)
- ・ セミナー、ワークショップの開催

5. 協力終了後に達成が期待される目標

- (1) 提案計画の活用目標
  - ・ 策定された計画に基づく下水道整備事業の実施
- (2) 活用による達成目標
  - ・ シリア国河川及び地下水へ流入する陸上からの汚濁負荷の削減

6. 外部要因

- (1) 協力相手国内の事情
  - (a) 政策的要因：政権交代等により開発政策の変更が生じ提案事業の優先度が低下する。
  - (b) 行政的要因：下水道関係部門への適正人材補充の不足、予算配分の不足等により事業化が困難となる。
  - (b) 経済的要因：経済事情の悪化による事業実施の困難。
  - (c) 社会的要因：シリア国の治安の悪化。
- (2) 関連プロジェクトの遅れ  
特になし

7. 貧困・ジェンダー・環境等への配慮 (注)

- ・ 本調査の対象地域には中小村落が多数存在しており、飲料水の汚染や灌漑用水の不足による収入への影響が問題となっている。本調査の結果に基づき下水道等を整備することにより住民の衛生状況改善及び処理水の灌漑利用に寄与する。
- ・ シリア国の EIA は法制化されていないが、JICA の環境社会配慮ガイドラインに基づき、調査を実施する。また、ステークホルダーとの協議の扱いに関し、相手国と協議の上決定する。ステークホルダー協議については、調査対象地域に複数の自治体が存在するため、ワークショップの開催、インタビューや質問書など現地に即した方法を検討する。

8. 過去の類似案件からの教訓の活用 (注)

- ・ 過去の下水道調査案件は建設費・維持管理費の問題から事業化されていない例が多い。本件

では調査において相手側の財務能力を見極め、また計画作成の際も相手側の財務能力に見合った計画を作成し、事業化に結びつくよう留意する。

#### 9. 今後の評価計画

##### (1) 事後評価に用いる指標

##### (a) 活用の進捗度

- ・策定したマスタープランが先方の政策・事業計画に反映されているか
- ・本計画にかかる事業化予算の確保状況

##### (b) 活用による達成目標の指標

- ・調査対象地域における下水道普及率及び下水処理率
- ・パイロットプロジェクト地域における飲料水源の水質の改善

##### (2) 上記 (a) および (b) を評価する方法および時期

- ・フォローアップによるモニタリング
- ・必要に応じて調査終了後5年後以降に評価を実施

(注) 調査にあたっての配慮事項

## 10. 環境社会配慮レポート

G. Director	T. Director	Officer

### Preparatory Study for Development Study (M/P or F/S)

Date: December 27, 2005

#### 1. Title of the Cooperation Project and Name of the Project Proponent

- (1) Title of the Cooperation Project  
The Study on Sewerage System Development in the Syrian Arab Republic
- (2) Name of the Project Proponent  
Ministry of Housing and Construction (MHC)
- (3) Implementing Agency  
Sewage Department of MHC

#### 2. Categorization and its Reason

Category: B

According to the screening format attached on the request from the government of the Syrian Arab Republic, Environmental Impact Assessment (EIA) including Initial Environmental Examination (IEE) is not required for the sewage project in Syria.

In the scoping conducted in this preliminary study, all environmental and social items are evaluated as C or D accordingly. Even if it is supposed that the desirable and wishful water quality improvement is expected in these project site areas, this project is classified as Category B in this preliminary study.

#### 3. Outline of the Project and the Location (Population, Race, Economics, Education, Land use, the Environment, Other socioeconomic situation)

##### 3-1 Outline of the Project

##### (1) Study Area

Review of the existing planning of sewerage sector nationwide.

Priority Governorates in Master Plan are as follows;

- 1) Damascus rural area Governorate (Barada-Awaji Basin)
- 2) Tartous Governorate and Lattakia Governorate (Coastal Basin)
- 3) Dar'a Governorate (Yamouk Basin)
- 4) Deir-ez-Zor Governorate and Al-Rakka Governorate (Euphrates Basin), and Al-Hasakeh Governorate (Dajleh-Khabour Basin)

##### (2) Project Description

< Phase I: Review of the existing planning of sewerage sector nationwide >

##### 1) Review of previous studies and existing data and materials relevant to the Study:

- ① Sewerage planning and related sewerage development projects,
- ② Management of water environment in river basin and coast,
- ③ Management of industrial wastewater effluent,
- ④ Water reuse for irrigation, and
- ⑤ Legal and institutional framework for water pollution control

##### 2) Evaluation of the existing sewerage planning and recommendations of development strategy:

- ① Legal and institutional framework,
- ② Organization,
- ③ Investment plan, and
- ④ Management and financial system of sewerage utilities

<Phase II: Formulation of a Master Plan for sewerage system development in some priority governorates

- 1) Collection and analysis of existing data and information
  - ① Natural, socio-economic and environmental conditions,
  - ② Land-use and infrastructure,
  - ③ Related development plans and projects,
  - ④ Water supply and irrigation,
  - ⑤ Inventory of water pollution sources,
  - ⑥ Environmental laws and regulations, and organization,
  - ⑦ Other relevant data and information
- 2) Study of present sewerage network condition
- 3) Analysis of the highly polluted wastewater which is drained from the factories
- 4) Establishment of database of small-towns and rural sewerage
- 5) Comparison study on technical alternatives:
  - ① Method of treatment, and
  - ② Construction cost between networks with pumping station and on-site small scale treatment plant.
- 6) Formulation of a development strategy and a Master Plan:
  - ① Forecast of planning framework,
  - ② Making of basic policy and development strategy,
  - ③ Planning for sewerage system,
  - ④ Recommendations on suitable treatment process for highly polluted industrial wastewater by kind of industry,
  - ⑤ Recommendations on strengthening management capacity of the concerned agency;
  - ⑥ Preliminary cost estimation, and
  - ⑦ Formulation of a development phasing plan.
- 7) Carrying out environmental and social considerations study according to JICA guidelines for environmental and social considerations.
- 8) Evaluation of the Master Plan

<Phase III: Feasibility Study for a project site which will be selected in Damascus rural area as a pilot project for training purpose>

- 1) Supplemental surveys and data collection, if necessary
  - ① Topographic and geological surveys,
  - ② Social survey, and
  - ③ Water quality analysis
- 2) Preliminary design of sewerage facilities including treatment plant
- 3) Operation and maintenance guideline, and
- 4) Plan of management, operation and maintenance
  - ① Organizational structure,
  - ② Staff and manpower training,
  - ③ Operation and maintenance guidelines, and
  - ④ Public dissemination.
- 5) Cost estimation
- 6) Financial plan and assessment of economic feasibility:
  - ① Target level of cost recovery, and
  - ② Tariff policy
- 7) Carrying out environmental and social considerations study according to JICA guidelines for environmental and social considerations
- 8) Formulation of implementation schedule
- 9) Recommendations on succeeding stages

(3) Target year

The target year for the Master Plan is 2025.

### 3-2 Outline of the Location

#### 1) Population

**Table1 Population Size 1995-2025 (thousands), according to the UN 2000**

	2000	2005	2010	2015	2020	2025
UN 2000	16,320	18,389	20,781	23,206	25,456	27,410

Source; UN estimation and Statistical abstract 2003  
(July 2005 estimation.) 18,448,752

#### 2) Race

Arab 90.3%, Kurds, Armenians, and other 9.7%

#### 3) Land Use

The bulk of the country is arid, with little vegetation. Nearly 20 percent was classified as desert. Another 45 percent of the land was classified as steppe and pasture, although its grazing capacity was very limited. Less than 3 percent of the land was forested, with only part of it commercially useful. Cultivable land amounted to 33 percent of the total area. 91.7 percent of the total cultivable area of 6.17 million hectares was cultivated.

Land use of each project site should be carefully investigated in further stage of the study.

#### 4) Land Ownership

The law defines the maximum of agricultural ownership in a manner that guarantees the protection of the farmer and of the agricultural worker against exploitation and insures increase in production. (Syrian constitution)

Land compensation and arbitration system has been established and is working well.

Land ownership and compensation of a project site for the feasibility study should be carefully investigated in further stage of the study.

#### 5) Natural condition

Geographically, Syria can be divided into four main regions containing 14 Governorates.

- The coastal region, which extends from the North to the south along the Mediterranean coast, between the mountains and the sea.
- The mountainous region, which includes the mountains and hills that run from the north to the south parallel to the Mediterranean Sea.
- The interior region, including the plains of Damascus, Horns, Aleppo, Al-Hasakeh, and Daraa, which is located to the east of the mountainous region,
- The desert area, that is the desert plains located in the southeastern part of the country along the Jordanian and the Iraqi borders.

#### State of the Water Resources (Available Water and Water Demand)

According to National Environmental Strategy and Action Plan for the Syrian Arab Republic (December 2003) (NESAP (2003)), an overview of surface and ground water resources, and the water use by sector in the hydrologic basins in Syria are as follows,

**Table2 Average surface and groundwater resources in the hydrologic basins in Syria**

Hydrologic Basin	Surface Area (km <sup>2</sup> )	Average Annual Precipitation		Average Annual Resources (million cubic meters)		
		mm	Million cubic meters	Surface water	Ground water	Total
Barada & Awaj	8,360	862	2,297	20	830	850
Orontes	21,634	403	6,822	1,110	1,607	2,717
Coastal	5,049	1,294	6,603	1,557	778	2,335
Tigres & Khabour	21,129	402	8,493	788	1,600	2,388
Euphrates & Aleppo	51,238	308	10,691	478	371	849
Tarmouk	6,724	287	1,930	180	267	447
Al Badia	70,786	138	9,800	163	180	343
Total	184,920	-	46,636	4,296	5,633	9,929

Source: NESAP (2003)

**Table3 Water uses by sector in Syria**

Sector	Year 1990 (million m3)	Year 1995 (million m3)	Year 2020 (million m3)	Percentage as of total consumption 1990 (%)	Percentage as of total consumption 2020 (%)
Household (drinking)	776	958	1,458	8.6	8
Industry	357	394	1,100	3.9	6
Agriculture	7,794	11,019	15,519	87.5	86
Total	8,927	12,371	18,077	100.0	100

Source: NESAP (2003)

#### 4. Legal Framework of Environmental and Social Considerations (Laws, Competent Agency, Project subjected to EIA, Procedures, Information Disclosure and Stakeholders participation)

##### 1) Laws and guidelines on EIA

###### ① Brief history

There are currently no legal provisions for EIA in Syria. Presidential decree number 11 of 1991 empowers the General Commission for Environmental Affairs (GCEA), under the Ministry of State for the Environmental, to monitor and evaluate and control the environmental effects of development activities. This decree has been used by GCEA to undertake environmental investigations for a small number of projects. More generally, however, GCEA carries out simpler checks under the decree, in order to issue environmental approvals for small-scale private sector developments, as part of established permitting processes.

A draft EIA was prepared in 1995 under a previous METAP (Mediterranean Environmental Technology Assistance Program) project, in preparation for enactment for an environmental act. An EIA unit was set up under the same METAP project, and currently administers the existing environmental approval process. However the enabling act for EIA is Environmental Protection Law No.50 of 2002, the detailed registration is a Draft Decree.

EIA studies for internationally funded projects have generally been undertaken by international consultancies, under the procedures of the funding agencies. These studies have been administered by the recipient line ministries, rather than by the GCEA's EIA Directorate.

According to EURO-MED PARTNERSHIP (SYRIA)-(National Indicative programme, 2005-2006), The project should be coherent with the principles of the EC Water Framework Directive and subject to Environmental Impact Assessment procedures similar to those required under the EC EIA directive.

## ② Present situation

At this moment, GCEA carries out simpler checks under the decree, in order to issue environmental approvals for small-scale private sector developments, as part of established permitting processes.

However, Syrian government endeavors to promote establishment of a new EIA system.

Recently the Minister of Local Administration and Environment (MoLAE) has announced 2 executive instructions for EIA- Executive Instructions (by law) for Law No. 50 for the year 2002, Modified by the Law No. 17 for the year 2004;

- a) about the preparation of standards and measured criteria for the environment elements and applying the required basis and instructions to make Environmental Impact Assessment.
  - 1) Technical specialized committees are formulated at GCEA having in its membership representatives of all related agencies and their mission is putting the related specifications to the environment elements (soil, air and water) or to update the available information in order to make EIA.
  - 2) The formulated committees put criteria.
  - 3) These committees present the results of their works to MoLAE through the Director General of the Commission for Environmental Affairs to be presented and approved by the Board of Environment Protection.
- b) about setting the necessary instructions and environmental conditions and specification for agricultural, commercial, industrial, residential and development projects, and the relevant pre-conditions for licensing or re-licensing any of items.
  - 1)-
    - a- specialized technical committees are formed in GCEA the members of which, represent all relevant agencies. The task of these committees is to set the necessary instructions and environmental conditions and specifications for environmental licensing or re-licensing, and renew the existing ones (Manual for Engineering and Environmental Conditions for Industries) for the industries that do not need the study for Environmental Impact Assessment.
    - b- the authorized agency in GCEA provide the approval of licensing these industries according to the fulfillment of these conditions.
  - 2)-
    - a- as for the industries that need EIA: the owner of the license submits an application for the approval on the license enclosed with a study of EIA for the new establishments and an environmental review study for the current establishments, provided that these studies should be prepared by one of the offices specialized in EIA.
    - b-The authorized department in GCEA will check the submitted studies and present a recommendation for approving or disapproving the license or asking to complete the study when it is necessary.
    - c-According to the recommendation of GCEA for approval the license will be granted by the Minister of Local Administration and Environment or whom he authorizes.

## ③ Establishment EIA system supported by Donor

“Institutional Support to the Syrian Water Sector” by GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit) will cooperate the establishment of EIA procedures within land use planning including:

- a) Sustainable water resources assignment and any major construction activities which might affect the environment.
- b) Revision, updating and complementation of the guidelines of 1994 as well as the legal basis for EIA.
- c) Assistance to the MoLAE as the competent authority to put into practice the procedures of requesting and approving EIA studies.
- d) Preparation of exemplary EIA studies serving as an orientation/guidelines for the general introduction of EIA studies.
- e) Institutionalization of revision and approval procedures; this also in coordination with the State Planning Commission (SPC)

## 2) Laws related Environment

Law No. 50 for the year 2002, Modified by the Law No. 17 for the year 2004

(List of the Environmental Conditions and Regulations Approved by the Board of Environment Protection)

- 1- Law of Environment No. /50/ for 2002 and its modifications, in English and Arabic.
- 2- The maximum limits of industrial polluters permitted to be discharged to the external environment (The Supreme Council for Environment Safety, 13, 5, 2002)
- 3- Categorization of the hazardous industrial wastes (The Supreme Council for Environment Safety, 13, 5, 2002)
- 4- National Criteria for Air Quality (The Supreme Council for Environment Safety, 13, 5, 2002)
- 5- The national plan for desertification control (The Supreme Council for Environment Safety, 13, 5, 2002)
- 6- Licensing system for the materials consuming the Ozone layer according to Montreal Protocol (Council of Environment Protection, 13, 10, 2002).
- 7- The allowed limits for noise (Council of Environment Protection, 13, 10, 2002).
- 8- The National Decree for Chemical Safety (Council of Environment Protection, 13, 10, 2002).
- 9- The standard for liquid wastes resulted from industrial activities, discharged into sewage net.
- 10- The national environmental strategy and operation plan. (Council of Environment Protection, 30, 4, 2003).
- 11- The technical criteria that should be provided in the laboratories and the list of approved laboratories. (Council of Environment Protection, 30, 4, 2003).
- 12- The technical manual for PCBs management. (Council of Environment Protection, 30, 4, 2003).
- 13- Inventory and management of electrical equipment that contain PCBs. (Council of Environment Protection, 30, 4, 2003).
- 14- The standard for the treated wastewater used for irrigation, 29, 4, 2003.
- 15- The manual for environmental check 2003.
- 16- Natural preserves (kinds, objectives and conditions) 2003.

(List of the criteria, specifications, conditions and regulations available and required to be approved by the Council of Environment Protection)

- 1- Hazardous wastes management system.
- 2- The preliminary list of the prohibited and restricted hazardous chemical materials.
- 3- Hazardous chemical materials management system.
- 4- The manual for hazardous wastes incineration.
- 5- The manual for hazardous wastes burial.
- 6- The standard for safe reuse of sludge resulted from treatment station /2665/.
- 7- The manual for engineering and environmental conditions for industries.
- 8- The general manual for EIA.
- 9- The national plan for emergency, concerning oil pollution.

(2) Competent Agency (Authority)

<Sectoral permit for Sewage Treatment Plant(s) and Network(s)>

Ministry of Housing and Construction

<Environmental acceptability>

EIA Directorate of General Commission of Environmental Affairs (GCEA)

EIA Department/ Directorates for Environmental Affaires (DFEA) of Governorates

(3) Procedure of EIA (in General)

- Obtaining a sectoral permit from the relevant Ministry,
- Obtaining an administrative permit from the relevant Governorate (can only be obtained after an environmental permit has been obtained from Directorates for Environmental Affaires (DFEA),
- Scoping stage (alternatives do not need to be considered by proponent),
- Implementation of EIA programme – includes preparation and submission of an EIS, (description of project, a baseline description, and prediction of likely impacts),
- Review of EIA by EIA Directorate; and
- Decision statement produced by EIA Directorate.

(There is no provision for public participation in the current procedural practices.)



Despite these procedures, where EIA's have been carried out, they have generally been a requirement of donor assisted aid and are therefore carried out to the relevant standards, i.e. World Bank, USAID, EU and JICA etc.

(4) Information Disclosure and Stakeholders Participation

The information disclosure and stakeholders participation in accordance with JICA guidelines for Environmental and Social Considerations is agreed.

5. Provisional Scoping (Adverse Impacts and Envisioned Mitigation Measures, Alternatives)

(1) Adverse Impact

**Table3 Checklist for Scoping**

No	Impacts	Rating	Brief Description
<b>Social Environment</b>			
1	Involuntary Resettlement	C	Possibility of resettlement for the sewage treatment facilities will be considered
2	Local economy such as employment and livelihood, etc.	D	Local economy will be improved slightly by the project
3	Land use and utilization of local resources	D	Quality of agricultural land and/or water resources will be improved.
4	Social institutions such as social infrastructure and local decision-making institutions	D	Technology will be transferred through the project.
5	Existing social infrastructures and services (such as Traffic/Public Facilities)	D	No facilities interfere
6	Split of Communities	D	No facilities interfere
7	Misdistribution of benefit and damage	C	Mal-maintenance of facilities may cause some damage in root of sewerage system.
8	Cultural heritage	C	Buried cultural heritage in the underground should be checked before the final decision of site selection.
9	Local conflict of interests	C	Water right conflict may occur in village
10	Water Usage or Water Rights and Rights of Common	C	Water rights and rights of the common in and surrounding area of project sites may be affected
11	Public health conditions	C	The public health condition will be improved by the project, however appearance of fly might be observed around sewage treatment plants.
12	Hazards (Risk) Infectious diseases such as HIV/AIDS	D	No impact. Scale of facilities is small.
<b>Natural Environment</b>			
13	Topography and Geographical features	C	Required area of plant may be large depending on the scale.
14	Soil Erosion	C	Mal-maintenance of facilities may cause some damage in root of sewerage system.
15	Groundwater	C	Mal-maintenance of facilities may cause some damage in root of sewerage system.
16	Hydrological Situation	D	The flow of rivers and condition of lake may changes to good environmental conditions.
17	Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)	D	No impact. Scale of facilities is small.
18	Flora, Fauna and Biodiversity	D	No impact. Scale of facilities is small.
19	Meteorology	D	No impact. Scale of facilities is small.
20	Landscape	C	Scale of the facilities is small and flat. However, wastewater treatment may be constructed at campestal area.
21	Global Warming	D	Green House Gases will be reduced.

Pollution			
22	Air Pollution	D	No contamination source / activities.
23	Water Pollution	D	Water quality will be improved by the project.
24	Soil Contamination	C	Drainage and sludge shall be treated adequately. Mal-maintenance of facilities may cause some damage in pipeline root of sewerage system.
25	Waste	C	Sludge must be treated adequately to be recycled as compost.
26	Noise and Vibration	C	During construction stage, Noise and Vibration will be occurred.
27	Ground Subsidence	C	Mal-Design of facilities may cause ground subsidence at site. Mal-maintenance of facilities may cause some damage in pipeline root of sewerage system.
28	Offensive Odor	C	Countermeasure to odor from wastewater treatment will be considered for the facility design condition.
29	Bottom sediment	D	No contamination source / activities.
30	Accidents	C	Mal-maintenance of facilities may cause some damage in the facilities and the root of sewerage pipeline system.

Note 1: Evaluation categories

A: Serious impact is expected

B: Some impact is expected

C: Extent of impact is unknown

(Examination is needed. Impacts may become clear as study progress)

D: No impact is expected. IEE/EIA is not necessary.

Note 2: The evaluation should be made with reference to the "explanation of item"

## (2) Overall Evaluation and Study Plan

**Table 4 Overall Evaluation Form**

Impacts	Evaluation	Study Plan	Remarks
Involuntary Resettlement	C	Site reconnaissance / interview survey with local residents shall be conducted. The sewage treatment facility site shall be selected based on the elaborate study. Agreement with all stakeholders shall be taken.	MHC Governorates
Misdistribution of benefit and damage	C	Maintenance of sewerage system should be planned properly. Budget allocation for maintenance should be taken.	MHC
Cultural heritage	C	The sewage treatment facility sites and sewerage pipeline system shall be selected based on the elaborate study to avoid damage to underground cultural heritage.	MHC Governorates
Local conflict of interests	C	Water rights and Rights of common in surrounding area of sewage treatment facility sites shall be studied. Agreement with all stakeholders shall be taken to avoid conflict in community.	MHC Governorates
Water Usage or Water Rights and Rights of Common	C	Water rights and Rights of common in surrounding area of sewage treatment facility sites shall be studied. Agreement with all stakeholders shall be taken.	MHC MOI Governorates
Public health conditions	C	To avoid appearance of fly in sewage treatment plants, countermeasure should be taken.	Operating establishment

Topography and Geographical features	C	If sewage treatment plant requires large area, site selection shall be done carefully.	MHC
Soil Erosion	C	Maintenance of sewerage system should be planned properly. Budget allocation for maintenance should be taken.	MHC
Groundwater	C	Maintenance of sewerage system should be planned properly. Budget allocation for maintenance should be taken.	MHC
Landscape	C	No high structure shall be planned. Discussion and agreement with local residents shall be taken.	MHC Governorates
Soil Contamination	C	Sludge treatment must be planned adequately to avoid soil contamination by heavy metals and Persistent Organic Pollutants (POPs) when the sewage plants treat industrial wastewater.	MHC MoLAE Governorates
Waste	C	Treatment method of the sludge shall be studied in the plan.	MHC Governorates
Noise and Vibration	C	During construction stage, Noise and Vibration will be occurred.	MHC Governorates
Ground Subsidence	C	Design of facilities should be done on the elaborate study for underground condition. Maintenance of sewerage system should be planned properly. Budget allocation for maintenance should be taken.	MHC Governorates
Offensive Odor	C	The prevention measure of radiating odor from facilities shall be taken. Discussion and agreement with local residents shall be taken.	MHC Governorates
Accidents	C	Design of facilities should be done on the elaborate study in consideration of soil condition and the selection of construction materials and should be designed based on the philosophy of "fail safe and fool proof". Maintenance of sewerage system and sewage treatment facilities should be planned properly. Budget allocation for maintenance should be taken.	MHC Governorates
Items classified to D in this provisional study	D	Should be re-examined in the later stage of the study based on the further information and interview.	MHC MoLAE Governorates

Note: Evaluation categories

A: Serious impact is expected

B: Some impact is expected

C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progress)

D: No impact is expected. IEE/EIA is not necessary.

### (3) Alternatives

#### 1) Without Project Alternative

If the project will not be commenced, the situation of each environmental item can be supposed as follows.

**Table 5 Supposed Environmental Situation without Project**

	Environmental Item	Supposed situation without Project
1	Involuntary Resettlement	Happen nothing
2	Local economy such as employment and livelihood, etc.	No change
3	Land use and utilization of local resources	No change
4	Social institutions such as social infrastructure and local decision-making institutions	No change
5	Existing social infrastructures and services (such as Traffic/Public Facilities)	No change
6	Split of Communities	No change
7	Misdistribution of benefit and damage	No change
8	Cultural heritage	No change

9	Local conflict of interests	No change
10	Water Usage or Water Rights and Rights of Common	Happen nothing
11	Public health conditions	May be worsen by the uncontrolled / untreated sewage water.
12	Hazards (Risk) Infectious diseases such as HIV/AIDS	May be worsen by the uncontrolled / untreated sewage water.
13	Topography and Geographical features	No change
14	Soil Erosion	No change
15	Groundwater	May be worsen by the uncontrolled / untreated sewage water.
16	Hydrological Situation	Happen nothing
17	Coastal Zone (Mangroves, Coral reefs, Tidal flats, etc.)	May be worsen by the uncontrolled / untreated sewage water.
18	Flora, Fauna and Biodiversity	No change
19	Meteorology	No change
20	Landscape	No change
21	Global Warming	No change
22	Air Pollution	No change
23	Water Pollution	May be worsen by the uncontrolled / untreated sewage water.
24	Soil Contamination	May be worsen by the uncontrolled / untreated sewage water.
25	Waste	No change
26	Noise and Vibration	No change
27	Ground Subsidence	No change
28	Offensive Odor	Happen nothing
29	Bottom sediment	No change
30	Accidents	No change

## 2) Other alternatives

Following alternatives can be considered.

- To employ individual treatment system such as septic tank system for each household / building which is studded in rural area.

## 6. Examination of Environmental and Social Considerations (budget, organization, personnel and experience of project proponent, framework and operating procedures regarding information disclosure and public participation)

The Team explained JICA environmental and social consideration guidelines, and that it will be applied to the Study. Ministry of Housing and Construction understood the policy of JICA guidelines, and agreed in principle to the following responsibilities and requirements.

- (1) Based on the guidelines, Ministry of Housing and Construction shall be responsible for conducting Initial Environmental Examination (IEE) for the high priority project(s) in collaboration with the Study Team. The Study Team shall provide Ministry of Housing and Construction with technical support in order to conduct IEE.
- (2) The information disclosure such as study reports shall be made in order to ensure the participation of and dialogues with various stakeholders, and to achieve appropriate understanding on environmental and social considerations.
- (3) The above-mentioned responsibilities and requirements will also be applied when environmental impact assessment is necessary.
- (4) In the course of implementation of the Study, public consultation with communities and stakeholders shall be implemented.
- (5) In case resettlement is inevitable from the result of the Master Plan study, Ministry of Housing and Construction shall be responsible for making resettlement action plan.

11. Scope of Work

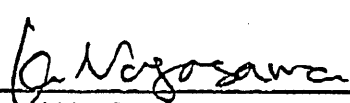

SCOPE OF WORK  
FOR  
THE STUDY  
ON  
SEWERAGE SYSTEM DEVELOPMENT  
IN  
THE SYRIAN ARAB REPUBLIC

AGREED UPON BETWEEN  
MINISTRY OF HOUSING AND CONSTRUCTION  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

Damascus: Mar. 015, 2006

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Mr. Humoud Al Husein  
Minister of Housing and Construction  
The Syrian Arab Republic



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Mr. Kazuhide Nagasawa  
Resident Representative  
Syria Office  
Japan International Cooperation Agency  
Japan

## I. INTRODUCTION

In response to the request from the Government of the Syrian Arab Republic, the Government of Japan has decided to conduct the "the Study on Sewerage System Development in the Syrian Arab Republic" (hereinafter referred to as "the Study") in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Syrian Arab Republic signed on July 18, 1985 (hereinafter referred to as "the Agreement").

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

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. to review existing planning of sewerage sector nationwide in the Syrian Arab Republic,
2. to formulate a Master Plan for sewerage system development in some priority governorates in order to prevent water pollution and improve health sanitation,
3. to conduct a Feasibility Study for a project site which will be selected in Damascus rural area as a pilot project for training purpose, and
4. to pursue technology transfer to the counterpart personnel in the course of the implementation of the Study.

## III. STUDY AREA

The Study area is as shown in the attached sheet of Annex I.

## IV. SCOPE OF THE STUDY

To achieve the above objectives, the Study will cover the following items:

Phase I: Review of the existing planning of sewerage sector nationwide

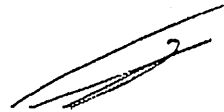
1. Review of previous studies and existing data and materials relevant to the Study:
  - (1) Sewerage planning and related sewerage development projects,
  - (2) Management of water environment in river basin and coast,
  - (3) Management of industrial wastewater effluent,
  - (4) Water reuse for irrigation, and
  - (5) Legal and institutional framework for water pollution control
2. Evaluation of the existing sewerage planning and recommendations of development strategy:
  - (1) Legal and institutional framework,
  - (2) Organization,
  - (3) Investment plan, and
  - (4) Management and financial system of sewerage utilities

Phase II: Formulation of a Master Plan for sewerage system development in some priority governorates

1. Collection and analysis of existing data and information
  - (1) Natural, socio-economic and environmental conditions,
  - (2) Land-use and infrastructure,
  - (3) Related development plans and projects,
  - (4) Water supply and irrigation,
  - (5) Inventory of water pollution sources
  - (6) Environmental laws and regulations, and organization;
  - (7) Other relevant data and information
2. Study of present sewerage network condition
3. Analysis of the highly polluted wastewater which is drained from the factories
4. Establishment of database of small-towns and rural sewerage
5. Comparison study on technical alternatives:
  - (1) Method of treatment, and
  - (2) Construction cost between networks with pumping station and on-site small scale treatment plant
6. Formulation of a development strategy and a Master Plan:
  - (1) Forecast of planning framework,
  - (2) Making of basic policy and development strategy,
  - (3) Planning of sewerage system,
  - (4) Recommendations on suitable treatment process for highly polluted industrial wastewater by kind of industry,
  - (5) Recommendations on strengthening management capacity of the concerned agency,
  - (6) Preliminary cost estimation, and
  - (7) Formulation of a development phasing plan
7. Carrying out environmental and social considerations study according to JICA guidelines for environmental and social considerations (See attached Annex II)
8. Evaluation of the Master Plan

Phase III: Feasibility Study for a project site which will be selected in Damascus rural area as a pilot project for training purpose

1. Supplemental surveys and data collection, if necessary
  - (1) Topographic and geological surveys,
  - (2) Social survey, and
  - (3) Water quality analysis
2. Preliminary design of sewerage facilities including treatment plant
3. Plan of construction and material purchasing
4. Plan of management, operation and maintenance
  - (1) Organizational structure,
  - (2) Staff and manpower training,
  - (3) Operation and maintenance guidelines, and
  - (4) Public dissemination
5. Cost estimation
6. Financial plan and assessment of economic feasibility:
  - (1) Target level of cost recovery, and
  - (2) Tariff policy
7. Carrying out environmental and social considerations study according to JICA guidelines for



- environmental and social considerations (See attached Annex II)
8. Formulation of implementation schedule
  9. Recommendations on succeeding stages

## V. STUDY SCHEDULE

The Study will be carried out in accordance with attached tentative schedule shown in Annex III. The schedule is tentative and subject to be modified when both parties agree upon and any necessity that arises during the course of the Study.

## VI. REPORTS

JICA shall prepare and submit the following writing reports and a digital data in English to the Government of the Syrian Arab Republic.

1. Inception Report  
Twenty (20) copies at the commencement of the Study
2. Progress Report  
Twenty (20) copies at the end of Phase I
3. Interim Report  
Twenty (20) copies at the end of Phase II
4. Draft Final Report  
Twenty (20) copies at the end of Phase III  
The Government of the Syrian Arab Republic shall submit its comments within one (1) month after receipt of the Draft Final Report.
5. Final Report  
Fifty (50) copies in English and fifty (50) copies in Arabic within one (1) month after receipt of the comments on the Draft Final Report from the Government of the Syrian Arab Republic

## VII. UNDERTAKING OF THE GOVERNMENT OF THE SYRIAN ARAB REPUBLIC

In accordance with the Agreement, the Government of the Syrian Arab Republic shall accord privileges, exemptions and benefits to the JICA study team (hereinafter referred to as "the Team") as follows:

1. To facilitate smooth implementation of the Study, the Government of the Syrian Arab Republic shall take the following necessary measures:
  - (1) To provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into the Syrian Arab Republic from Japan in connection with the implementation of the Study,
  - (2) To bear claims, if any arise, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.
2. Ministry of Housing and Construction shall act as the counterpart agency to the Team and also



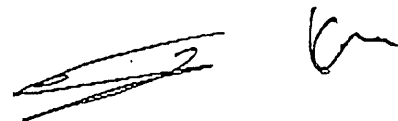


as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

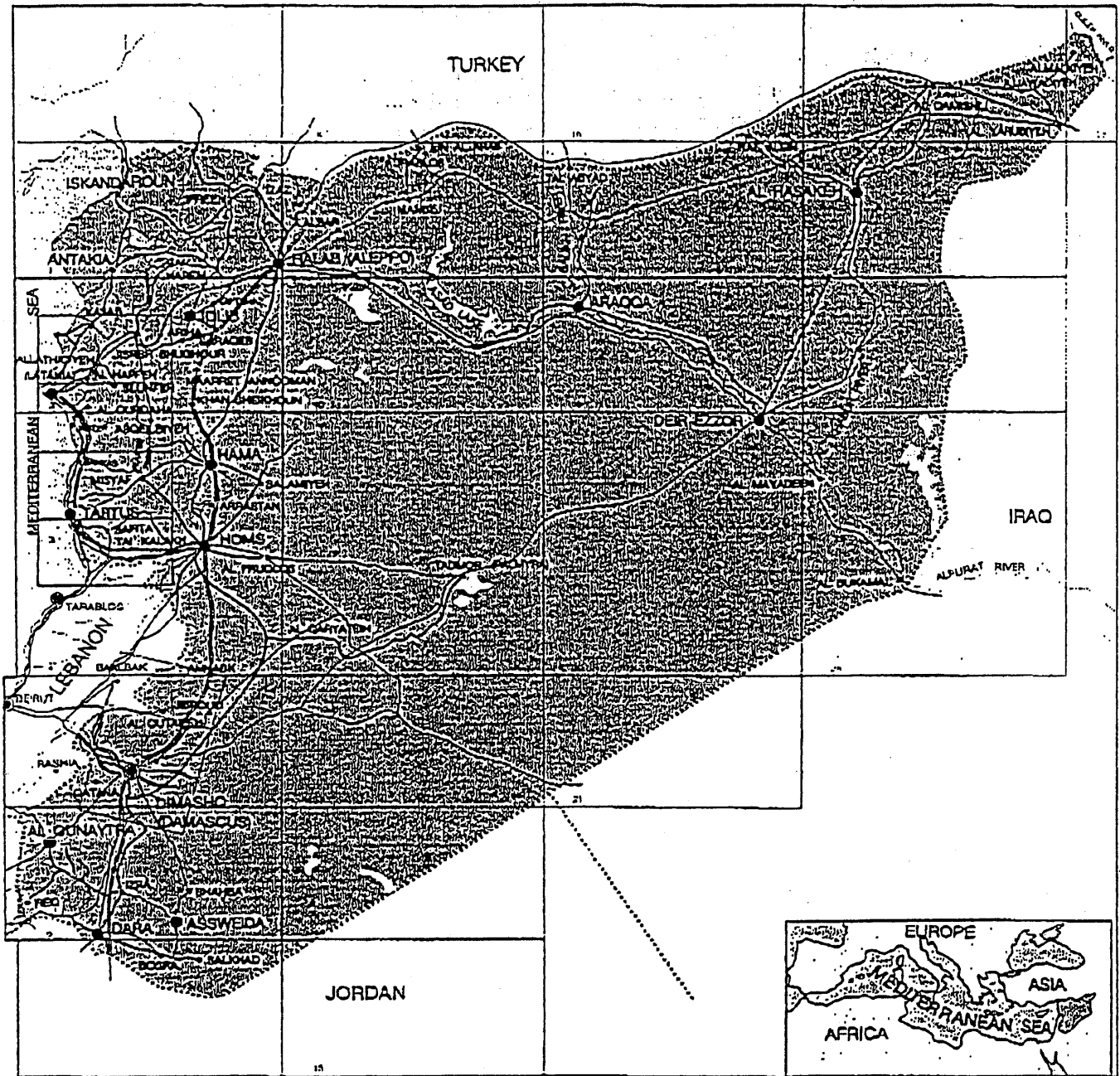
3. Ministry of Housing and Construction shall, at its own expense, provide the Team with the following in cooperation with other organizations concerned:
  - (1) security-related information on as well as measures to ensure the safety of the Team,
  - (2) information on as well as support in obtaining medical service,
  - (3) available data and information related to the Study,
  - (4) counterpart personnel and supporting staff,
  - (5) suitable office space with necessary office equipment and facilities, and
  - (6) credentials or identification cards

## VIII. CONSULTATION

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

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# STUDY AREA



## Priority Governorate in Master Plan

- Damascus rural area
- Tartous
- Lattakia
- Dar'a
- Al-Rakka
- Deir-ez-zor
- Al-Hasakeh

*[Handwritten signature]*

## Annex II

### Terms of Reference for the Environmental and Social Considerations Study

#### Environmental and Social Considerations Study (TEE Level)

1. Scoping
2. Consideration and analysis of environmental baseline data
  - (1) Social and economic conditions  
population, economy, employment, transportation, infrastructure/public facilities (road, bridge, water supply, sewerage, etc.), land use, water use, land ownership, public health, local conflicts, religious groups, cultural heritage/historical site, hazards(risk), accident, protection/reserved area, etc.
  - (2) Natural conditions  
Topography, geology, soil, ground water, meteorology, hydrology (water level, tidal current, wave, etc.), ecology (fauna & flora), vegetation/forests, water bodies (sea, river, canal, lake, reservoir, pond, etc), erosion, landscape, natural disaster, etc.
  - (3) Pollution  
Air pollution/quality, water pollution/quality, soil contamination, noise and vibration, land subsidence, offensive odor, waste materials, etc.
3. Initial environmental examination and study on mitigation measures (including study on alternatives)
4. Consultation with stakeholders (stakeholders meeting)

#### Environmental and Social Considerations Study (EIA Level)

1. Scoping
2. Additional collection and analysis of environmental baseline data
3. Supplementary survey and analysis (for requirement of specific data/information)
4. Environmental impacts assessment and study on mitigation measures (including study of alternatives)
5. Preparation of environmental management plan including monitoring program
6. Consultation with stakeholders (stakeholders meeting)



Tentative Schedule of the Study

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Work Schedule	[Empty Box]															
Reports	△ IC/R			△ PR/R						△ IT/R					△ DF/R	△ F/R

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

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