

**COUNTRY PROFILE
ON
ENVIRONMENT**

SYRIA

November 1998

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USERS GUIDE: Contents of the Report

This report consisted of the following Chapters on environmental information of the country.

1. Keywords of the Environment

Various features and principal environmental issues and their related matters of the country are schematized within 1 page to easily understand the country's natural and social environmental issues on the whole.

2. Fact Sheet

Principal indices and natural and social environmental characteristics of the country such as economy, demographic statistics, socio-economic conditions, various important resources available in the country are described.

3. Institutional Context

3.1 Environmental Agency

Matrix table on governmental agencies related to the environmental issues in the Chapter 4 is described to grasp the role of the agencies easily. Responsibilities and organizational structure of the principal responsible agency for the environment, and responsibilities of related agencies are explained. Main activities of the various environmental non-governmental organizations are described in the table.

3.2 National Environmental Policy

Environmental policy of the country such as national environmental action plan is explained.

3.3 Environmental Laws and Regulations

Environmental laws and regulations of the country including their status of applications are described.

4. State of the Environment

In this Chapter, status of the various environmental issues as follows are covered with information on related agencies, related standards, laws and regulations, examples of the issue are explained. In the section 4.3, other kind of considerable environmental issues in the country are described based on the report which local consultant prepared.

4.1 Air Pollution	4.7 Waste Water Management
4.2 Water Pollution	4.8 Forest Conservation/Desertification
4.3 Other Pollution	4.9 Biodiversity
4.4 Waste Management	4.10 Natural Resource Management
4.5 Energy Conservation and Alternative Energy	4.11 Natural Disaster
4.6 Water Supply	4.12 Environmental Education

5. International Relationship

Status of the implementation of the economic and technical assistance projects in the country are outlined. International conventions and agreements on environment which the country agreed and ratified are listed up in section 5.1, and environmental projects which are funded and/or implemented in the country by donor countries and international organization in the section 5.2. In addition, location map of the project funded and implemented by using the Official Development Assistance (ODA) of Japanese government are showed.

6. Sources of Information

Governmental environmental agencies related institutions and NGOs are listed with the some information such as contact address and e-mail address.

7. References

References used in the report are listed.



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1. KEYWORDS OF THE ENVIRONMENT

1.1 Features of the Country

	Related pages
<p>① Gross Domestic Production(GDP) US\$1,413 per capita (Japan : US\$33,857, China : US\$361) Total : US\$18 billion</p>	<p>· 2. Fact Sheet p.3</p>
<p>② High-concentrated Urban Population Urban population rate: 52% Total population: 14.6 million, Urban population: 7.6 million</p>	<p>· 2. Fact Sheet p.3 · 4.1, 4.2, 4.4</p>
<p>③ Syrian Desert Steppe 60% of total area in Syria</p>	<p>· 2. Fact Sheet p.3</p>

1.2 Keyword of Environmental Issues

	Related page
<p>① Water pollution</p> <ul style="list-style-type: none"> · Improper industrial effluent disposal · Contamination of ground water · Depletion of water resources · Uncontrolled sewerage system 	<p>4.2 Water pollution p. 9 4.2 Water pollution p. 9 4.6 Water supply p. 14 4.7 Waste water management p. 14</p>
<p>② Urban environment degradation</p> <ul style="list-style-type: none"> · Air pollution from traffic, power production, and industries 	<p>4.1 Air pollution p. 8</p>
<p>③ Soil degradation</p> <ul style="list-style-type: none"> · Loss of vegetative cover by fuel wood use · Communal grazing and conversion of rangeland · Salinisation · Desertification 	

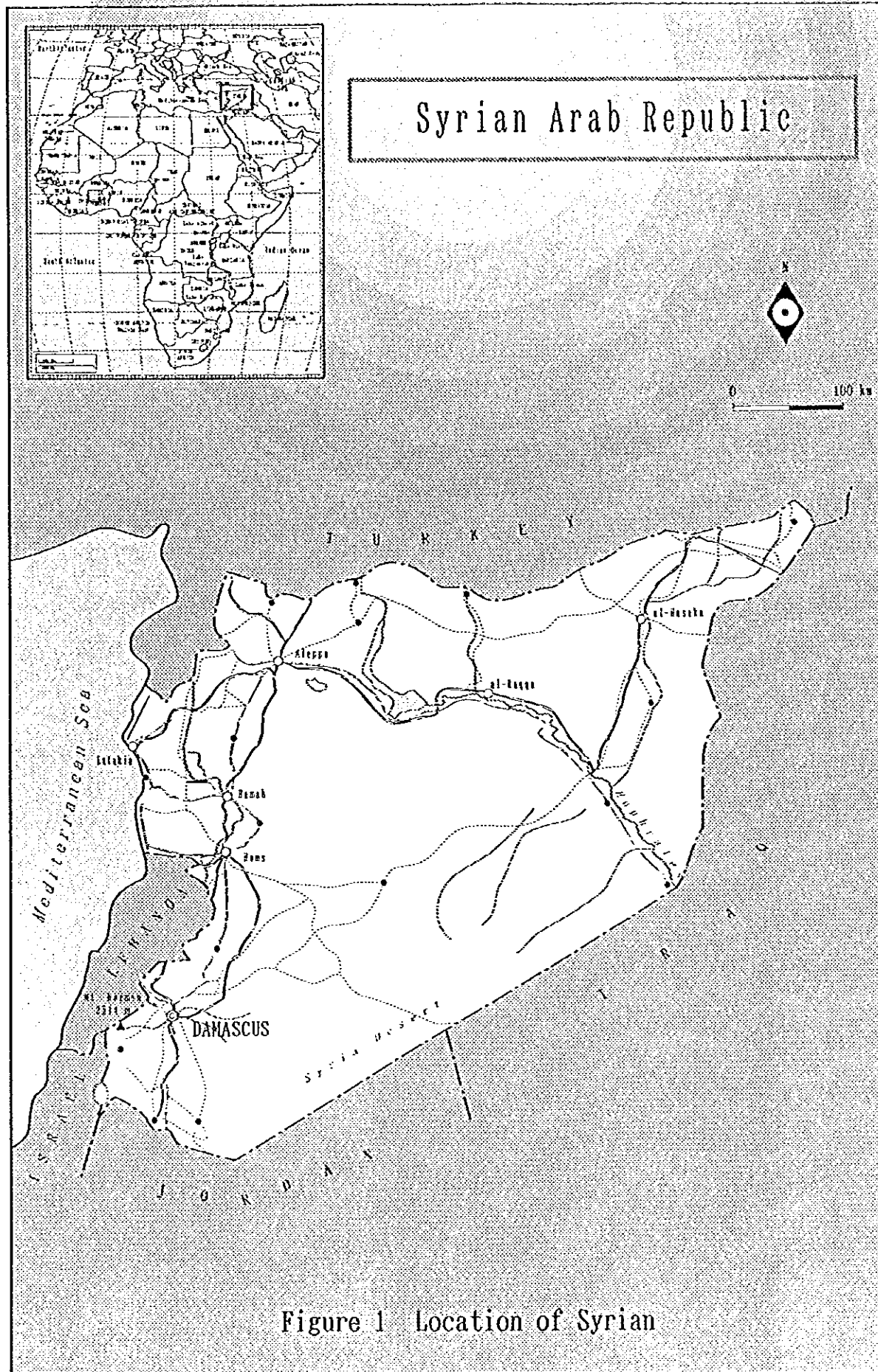


Figure 1 Location of Syrian

Source: Data Atlas 1994 - 1997

2. FACT SHEET

2.1 Socio-economic Index

Index	Data	Data year	Reference
Population	14.6 million (annual average incremental rate : 3.4% (1990~95))	1995	b)
Race	Arabian 85%, Armenian 5%, Kurd 3%, Palestinian 2%	no information	d)
Religion	Islam 85%, Christianity 13%, Judaism	no information	d)
Literacy rate	Adult female : 49% Adult male : 82%	1990	b)
Urban Population rate	52% (7.6 million)	1995	b)
Life expectancy	67 (1990~1995 average)	1990-95	b)
Under-5 mortality rate	39 (per 1,000)	1993	b)
GNP ¹	\$15,582 million (\$1,219/person)	1993	b)
GDP ¹	\$18,061 million (\$1,413/person)	1993	b)
GDP structure	Agriculture : 30% Industry : 23% Service industry & others : 48%	1993	b)
Prime industry	oil product, textiles, cement, tobacco, carpet, sugar manufacture	1996	d)
Prime resource	oil, phosphorus ore, gypsum, salt, wool, cotton, grain	1996	d)
Safe water (% of population with access) ²	Urban : 92% Rural : 78%	1980-1995	b)
% of sewerred population ³	Urban : 100% Rural : 100%	1980-1995	b)
Human Development Index (HDI)	0.755 (World rank 78, GDP per capita rank 66 in same year)	1994	c)

¹ : The estimated value of the GNP was exchanged and adjusted from local currency into US\$ by means of 3-year average of exchange rates. The estimated value of the GDP was presented in US\$ of 1993 based on the exchange rate.

² : "Safe water" includes treated surface water, and untreated water which is pumped up from protected spring / excavated well and sanitary well.

³ : "Sewered population" should be met conditions that the population in urban area can use public sewerage and indoor facility such as dug hole outdoor toilet, pouring water toilet, private sewerage system, public community toilet, and similar facilities, and that the population in rural area can use dug hole outdoor toilet, pouring water toilet, or other proper treatment methods.

2.2 Geographical Characteristics

Area : (no information)
Geographical features : 1) Coastal region (moderate temperature, strong winter rain, high humidity during summer); Lattakia, Banias, Tartous , 2) Coastal Mountain (rainy winter, moderate climate during summer), 3) Upland (hot and dry in summer, Syria desert steppe); Aleppo, Idlep, Hama, Homs, Damascus, Quneitra, Daraa a, Sweida, 4) Middle and East Syrian Desert Steppe "Al Badia" (60% area of Syria), 5) Southeast Sand Area (low precipitation (150-200 mm/year)), 6) Euphrates Valley: Deir El Zour, Raqqa, 7) Syrian-Jordan Border
Highest place : (no information)

Source: a)

2.3 Meteorological Characteristics

Climate: Mediterranean sea climate
Season: rainy winter and dry & hot summer
Average temperature: (no information)
Average annual rainfall: (no information)
Climatic classification: (no information)

Source: a)

2.4 Ecological Characteristics

Biogeographical feature: (no information)
Identified animals and plants: (no information)
Protected area: (no information)

Source: a)

2.5 Hydrological Characteristics

Main river: Barada, Orantes, Euphrtes
Lakes: Assad id

Source: a)

3. INSTITUTIONAL CONTEXT

3.1 Environmental Agency

3.1.1 Governmental Agency

(see "6. SOURCES OF INFORMATION" on each agencies and its contact address.)

Governmental Agency	4.1	4.2	4.3		4.4	4.5	4.6	4.7	4.8	4.9	4.10	4.11	4.12
	Air pollution	Water pollution	(1) Land	(2) Nitrate	Waste	Energy	Water Supply	Waste Water	Forest	Biodiversity	Resources	Disaster	Education
Ministry of Environment	○	—	na	na	na	na	—	na	na	—	—	—	na
Ministry Transport	○	—	na	na	na	na	—	na	na	—	—	—	na
Ministry of Electricity	○	—	na	na	na	na	—	na	na	—	—	—	na
Ministry of Health	○	○	na	na	na	na	—	na	na	—	—	○	na
Environment Directorate Basins	○	—	na	na	na	na	—	na	na	—	—	—	na
Ministry of Irrigation	—	○	na	na	na	na	○	na	na	—	—	—	na
Ministry of Housing and Utilities	○	○	na	na	na	na	○	na	na	—	—	—	na
Ministry of Agriculture	—	○	na	na	na	na	—	na	na	○	—	—	na
Governorate authorities	—	—	na	na	na	na	○	na	na	—	—	—	na
Ministry of State Environment (MSE)	—	—	na	na	na	na	—	na	na	—	○	—	na
State Planning Commissioner (SPC)	—	—	na	na	na	na	—	na	na	—	○	—	na
Ministry of Interior Affairs	—	—	na	na	na	na	—	na	na	—	—	○	na
Ministry of Defense	—	—	na	na	na	na	—	na	na	—	—	○	na
Ministry of Education (MOE)	—	—	na	na	—	—	—	—	—	—	—	—	○
Others	—	—	na	na	na	na	—	na	na	—	—	—	na

Note:1) : ○ → related — → No relation na → no information

2) : 4.3(1) Agricultural land degradation, 4.3(2) Nitrate and phosphate pollution. 4.4 Waste management.

4.5 Energy conservation and alternative energy, 4.7 Waste water management.

4.8 Forest conservation / desertification, 4.10 Natural resource management.

4.11 Natural disasters, 4.12 Environmental education

3) : Refer to each section related to other agencies when column "Others" is filled by ○.

Governmental organization related to environmental issues

Organization / Outline of activities	Annual budget	Number of staff
Higher Council for Environmental Safety (HCES) <ul style="list-style-type: none"> • Responsibility for setting national policy on environment and coordinating environmental management activities within government • The HCES is an inter-ministerial body, over which the Prime Minister presides, comprising the Ministers of local Administration, Irrigation, Agriculture and Agrarian Reform, Transportation, Media, Industry, Electricity, State Planning, Health, Petroleum and Mineral Resources, Housing and Utilities, and Environment • The mandate of HCES is to: <ul style="list-style-type: none"> - Issue national policies and plans for environmental protection - Set standard for pollution control - Issue requirements and conditions for industrial operations and activities with negative impacts on the environment - Take actions necessary to stop prevent and impose restrictions on polluting and activities 	(no information)	(no information)
Ministry of State Environment (MSE) <ul style="list-style-type: none"> • Established in 1991 • Lead Ministry within Government on environment, with policy formulation, inter-sectoral coordination, regulatory and research functions • Includes a Consultative Technical Committee and nine environment Committee which assist with policy formulation and inter-sectoral coordination functions 	(no information)	(no information)
General Council for Environmental Affairs (GCEA) <ul style="list-style-type: none"> • Formed with the fundamental objective of establishing the technical framework for environmental protection and prevention of pollution in Syria as the technical arm of the MSE • The GCEA has the following responsibilities: <ul style="list-style-type: none"> - Reviewing and studying environmental problems - Working towards the prevention and mitigation of new environmental problems - Preparing laws, regulations and standards - Raising environmental awareness - Assess hazards from the use of substances - Reviewing all activities with actual or potential impact on the environment - Studying international agreements and their importance to Syria • An environmental impact assistance provided by METAP 	23 million Syrian pounds	60
Scientific and Environmental Research Centre (SERC) <ul style="list-style-type: none"> • Established within the MSE by legislative Decree No. 16 of 1991 • A national centre for scientific and environmental study and research • The SERC's mandate includes: (i) performing studies necessary for setting national environmental standards, (ii) monitoring environmental pollution at the national level, (iii) creating an environmental information system, (iv) monitoring laboratory facilities for scientific and environmental research, (v) publishing the results of scientific research, (vi) cooperating with scientific research centres 	(no information)	(no information)
Ministry of Housing and Utilities (MOHU) <ul style="list-style-type: none"> • Providing potable water to all major settlements • Collecting and disposing of sanitary wastes • Supervising urban land use planning and issuing permits 	(no information)	(no information)
Ministry of Agriculture and Agrarian Reform (MOAAR) <ul style="list-style-type: none"> • Responsibility for the agriculture sector in Syria, as well as primary responsibility for management conservation of number of Syria's natural resources, including forests, range lands and grasslands <ul style="list-style-type: none"> - The Soils Department performs research on soil fertility, desalination, and rehabilitation of soils - The Badiah Department is responsible for conservation of grasslands for grazing in Badiah, including management of 28 protected areas for this purpose - The forestry Department is charged with protection of national forest lands, restoration of damaged forest areas, and afforestation programs - The Agricultural Affairs and Research Department undertake agricultural research and development programs 	(no information)	(no information)
Ministry of Health (MOH) <ul style="list-style-type: none"> • Responsible for the public health sector, including the prevention and control of environmental-related health problems and diseases 	(no information)	(no information)
Ministry of Irrigation (MOI) <ul style="list-style-type: none"> • Responsible for maintaining and protection all public water resources in Syria, including rivers, lakes, coastal waters, springs, and ground water • Has a Water Pollution Control Department, which has broad authority under law 2145 of 1971 to regulate and control sources of water pollution, as well as water pollution control department in five river basins, which conduct water quality monitoring and control activities • Has authority to issues regulations setting water quality standards and discharge limitations, to inspect 	(no information)	(no information)

Organization / Outline of activities	Annual budget	Number of staff
<p>facilities causing water pollution, to make samples and to analyse water quality, and to advise polluters on ways of reducing water pollution enforcement action to obtaining compliance with water pollution requirements; however, must be taken by local government or by the appropriate ministry</p> <ul style="list-style-type: none"> • Promulgated standards for drinking water quality and ground-water protection • Has prepared new guidelines for industrial waste water discharges 		
<p>Ministry of Industry (MOIN)</p> <ul style="list-style-type: none"> • Responsible for overseeing the operation of those industries which because of their strategic importance to the national economy, are reserved for the public sector • Comprise approximately 100 industries including some of the heaviest polluters such as cement, sugar, food, textiles, and chemicals • The Directorate of Scientific and Technical Affairs supervises issues of pollution control, safety, and health 	(no information)	(no information)
<p>Ministry of Oil and Mineral Resources (MOMR)</p> <ul style="list-style-type: none"> • Responsible for the important oil industry as well as the exploitation of other mineral resources • General Establishment for Geology and Mineral Resources includes a Directorate of Environmental Geology and land use which provides support for geo-environmental studies and planning 	(no information)	(no information)
<p>State Planning Commission (SPC)</p> <ul style="list-style-type: none"> • Responsible for overall development planning 	(no information)	(no information)
<p>Ministry of Culture</p> <ul style="list-style-type: none"> • Charged with protecting the cultural heritage • Directorate General of Antiquities and Museums (DGAM) is the body established 	(no information)	(no information)
<p>International Research Organizations</p> <ul style="list-style-type: none"> • Cooperating with several regional and global environmental research organisations including: <ul style="list-style-type: none"> - The Arab Centre for the Study for Arid Zones and Dry Lands (ACSAD), is an important regional centre for environmental research and dissemination of information among Arab countries on issues such as water resources soil classification, range management, desertification, and soil conservation/erosion - The Centre for Environmental Development for Arab State and Europe (CEDARE) is also active in Syria focusing on fresh water, land use and information systems - The international Union for the Conservation of Nature (IUCN), which Syria joined recently (July 1997) is interested in assisting in establishing nature conservation areas and drafting environmental law 	(no information)	(no information)

Source: a)

3.1.2 Non-governmental Organization (NGO)

Name of NGO	Established year	Main activities
Society for Environmental Protection	1986	(no information)

Source: a)

3.2 National Environmental Policy

Policy/Project Name and Contents	Funding or Implementing Agency
<p>Environmental Policies in 8th Five year Plan</p> <ul style="list-style-type: none"> • Construction of treatment plants in all cities to reduce pollution of rivers and springs and the use of sewage for irrigation (the construction of treatment plants has already started in all big cities and nearly finished in Damascus) • A programme to construct composting plants for treatment of solid wastes • Requirement for an EIA with the economic feasibility and any new project considered under the plan • Removal of dangerous and polluting industries to industrial areas outside the cities • Measures to stop planting in steppe areas to avoid erosion and retain land for grazing • Measures will be taken to increase the number of construction areas for plants and animals in the light of biological diversity study carried out recently • Control of unlawful housing by the introduction of (unspecified) measures to stop its expansion, and provision at the same time of the basic services necessary for people to live decently • The gradual introduction of unleaded gasoline especially in imported vehicles • Pollution controls will be required on factories with particulate 38 • Emissions leg dust from cement factories • Replacement of fuel oil by gaz in most electricity generating plant, as well as other factories if gaz resources are sufficient 	(no information)

Source: a)

3.3 Environmental Laws & Regulations

Laws & Regulations	Status	Related Sections
<p>Law No.16 of 1982 on irrigation</p> <ul style="list-style-type: none"> This law empowers Ministry of Irrigation in charge of irrigation to regulate water use and to monitor water quality. However, a set of regulations also involve: <ul style="list-style-type: none"> Ministry of health to oversee drinking water from the health viewpoint (Article 1 of the Decree No.111 of 1 September 1996; Ministry of irrigation through its Directorate for Water Pollution Control created by the Decree 2145 of 1971 which is defined as lead agency in the matter of water pollution control, and Ministry of Agriculture and Agrarian Reform to oversee the protection of rural water against pollution according to Decree No.10 of 26 March 1972. MOI prepared an overall legislation on water use which provide for a unified system of water pollution control in 1987, but the draft is still under consideration 	Valid	4.2, 4.6
<p>Law No.11 of 1991</p> <ul style="list-style-type: none"> This Law is related to economic investment projects which require Environmental Impact Assessment (EIA) 	Valid	
<p>Decision of January 12, 1992 of the Minister of State for Environment</p> <ul style="list-style-type: none"> This decree was established an Environmental Impact Assessment Commission (EIAC) within the General Commission for Environmental Affairs (GCEA). This EIAC is comprised of representatives of the Ministries of Industry, Tourism, Environment. The EIAC is assisted by four academics whose role is to advise EIAC on technical issues. 	Valid	
<p>Law No.7 of 1994</p> <ul style="list-style-type: none"> This law states on several issues related to biodiversity protection, and constitutes a good attempt to promote a sustainable forestry policy. This law replace the Law No.66 of 1953. 	Valid	4.9
<p>Law No.140 of 1970</p> <ul style="list-style-type: none"> This Law amended and completed by Law 13 of 1983 on the protection of rural lands 	Valid	
<p>Law No.10 of 1972</p> <ul style="list-style-type: none"> This Law is related to the protection of marine domestic water and other international water against oil pollution 	Valid	4.2
<p>Law No.30 of 1964</p> <ul style="list-style-type: none"> This law is related to the protection of marine living resources 	Valid	4.9
<p>Law No.19 of 1984</p> <ul style="list-style-type: none"> This law is related to car traffic as well as other environmentally relevant hazardous industries, habitats, and natural parks 	Valid	
<p>Draft environmental law</p> <ul style="list-style-type: none"> The Draft Environmental Law was prepared by GVCEA and submitted to the People's Assembly for the regular approval procedure. This law is essential to provide the GCEA the umbrella to act as coordinating body and to link all scattered environmentally related laws and issues, the environmental integrated management and control 	To be adopted	

Source: a)

4. STATE OF THE ENVIRONMENT

4.1 Air Pollution

Air pollution in Syria is becoming one of the main public concerns. However, the database on which to quantify the extent of high concentrations of the key pollutants is weak. In 1989 there was a 3-month monitoring campaign in Damascus. Between 1992 and 1994 there were short campaigns in the main cities (Damascus, Aleppo, Homs, Hama, Tartous). In 1995 there was a year-long campaign in Damascus. Although limited monitoring data are available, it can however be predicted with some confidence that air quality degradation in cities and around industrial sites in Syria is overwhelming: a) motor vehicle emissions, b) burning of fuel oil by industry, power generation and domestic heaters, c) highly polluting and inadequately regulated refineries, cement and fertiliser factory.

Source a)

Related Agency		
<i>National Level:</i>		
① Ministry of Environment	② Ministry of Transport	③ Ministry of Electricity
④ Ministry of Health	⑤ Ministry of Housing	
<i>Local Level</i>		
⑥ Environment Directorate Basins		

Source: a)

Causes and Trends on Air Pollution
1) Motor vehicle emissions, particularly the old fleet of cars, with average age of more than 15 years, and poor traffic management resulting in cars spending a significant amount of time standing idle in queues with their engines running.
2) Industrial emissions mainly in hotspots around industrial sites such as cement plants, queries, power stations, and the refineries.
3) Heating emissions which are thought to contribute significantly to CO and soot concentration but only during the 4-month winter period.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on air pollution	?	
② Ambient air quality standard	?	
③ Emission standard (stationary and/or mobile sources)	?	
④ Environmental monitoring results	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.2 Water Pollution

Water pollution has recently become a major issue in Syria. Most areas in Syria are affected. The problem is in part related to the declining quantity of the water resource. As river flows decline, the dilution ability of the river is reduced and eventually reaches a critical level. With ground water, as the storage level reduces salinity increases and similar to river flows, concentrations of contaminants such as agricultural chemicals are increased due to reduced dilution abilities.

Source a)

Related Agency	
① Ministry of Irrigation (MOI)	② Ministry of Housing and Utilities (MOHO)
③ Ministry of Agriculture	④ Ministry of Health (MOH)

Source: a)

Major Sources of Water Pollution
1) Agricultural runoff: It is a major source of the pollution all over Syria with the exception of the Al-Badia basin. Even within that basin groundwater salinity is increasing due to overuse of water and declining reserves in the aquifers. Most agricultural pollution is created by small scale, individual farm operations. The means of controlling pollution is reduction in the use of agricultural chemicals and the correct use of agricultural chemicals.
2) Disposal of industrial waste: Types of industrial wastes are as variable as industries which produce them. Legislation already exist in Syria which disallows untreated wastes from being dumped but this is rarely enforced.
3) Sewage and domestic waste water: Sewage treatment plants are in place in many areas of Syria and new ones are planned or under construction in main cities. Many of these plants provide only primary treatment and much of the population remains without any level of treatment. Disposal of untreated or partially treated waste water into the rivers and into groundwater, is major water quality problem in Syria.
4) Urban development: Urban development contribution directly to water pollution through runoff water picking up pollutants deposited which have been deposited on the ground. Indirectly, it results in greater levels of waste water, industrial wastes and the loss of green spaces and wetlands which can act as purifiers for run off

Source: a)

Possible Solutions
1) Planning and installation of new sewage treatment plants then reusing water for agriculture and industry where appropriate.
2) Control of industrial waste disposal through legislation; monitoring and awareness campaigns; incentives such as tax reductions for treatment facilities; and tailored monitoring programs.
3) Reducing agricultural pollution by minimizing the use of some substances and banning others, and extending awareness campaigns carried out under existing agricultural extension programs.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on water pollution	○	• Law No.16 of 1982 on irrigation • Law No.10 of 1972
② Water quality standard	?	
③ Effluent standard	?	
④ Drinking water standard	?	
⑤ Water quality monitoring	?	
⑥ Guidelines on water quality	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.3 Other Pollution

(1) Agricultural Land Pollution

Areas of agricultural land around industrial cities have been polluted by the illegal discharge of industrial solid waste and sludge and the fall-out of gaseous emissions (from cement factories for example). Areas close to the oil refinery in Homs and parts of the Ghouta around Damascus in particular have been severely polluted in this way. Although the area of land contaminated is relatively small, the damage is costly to remedy and other environmental problems (polluted groundwater) may also be caused.

Source a)

Related Agency
(no information)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on agricultural land pollution	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

(2) Nitrate and Phosphate Pollution

Agriculture can be major source of nitrate and phosphate in drinking water by leaching of fertilisers out of the soil into water courses.

Source a)

Related Agency
(no information)

Possible Solutions
1) Careful targeting of fertilizer (both inorganic and organic) to avoid exceeding crop requirements. 2) Monitor of soil and crop fertility. 3) Ensure that the fertilizers are applied when they can be taken up by the growing crops. 4) Establishing nitrate and/or phosphate vulnerable zones in areas which have high concentration of nitrate and/or phosphates in surface and ground waters. 5) Restricting the amount and method of fertilizer use in nitrate/phosphate vulnerable areas.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on nitrate and phosphate pollution	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.4 Waste Management

There are only four waste treatment plants in Syria. Most of these plants are old and do not have the capacity of treating the large quantities of wastes which result from major Syrian cities so most wastes are disposed of without treatment in surface dumps, most of which are located on the outskirts of cities and are considered illegal. There is little segregation of wastes in Syria and solid waste contains domestic, hospital and industrial wastes. Some authorities provide special collection service for medical waste and dispose of it in a separate area where it is immediately covered. And medical waste mostly, however, it is treated in the same way as domestic waste.

Source a)

Related Agency
(no information)

Amount of Solid Waste Collected by Several Munitipalities

Municipality	Total collected (ton/day)	Inhabitants	Waste/person (kg/day)
Jbab	4	9,000	9.46
Al Zabadanee	55	25,000	2.17
Daria	40	90,000	0.44
Al Swedaa	100	110,000	0.91
Daraa	50	130,000	0.38
Harrasta	60	250,000	0.24
Doma	80	250,000	0.32
Lattakia	350	350,000	1.00
Hama	250	360,000	0.69
Homs	750	850,000	0.88
Aleppo	1,650	2,160,000	0.76
Damascus	1,000	2,500,000	0.40
Total	4,389	7,084,000	

Note: Total collected solid waste includes commercial waste and domestic waste with some waste from agriculture and small industries.

Source: a)

Costs and Cost Recovery
All costs of waste collection disposal and treatment are born directly by the governorates which raise part of the required funds through taxation whose levels are determined by national law but which is collected locally. There are two taxes applied:
<ul style="list-style-type: none"> • a cleanliness tax on houses of 75-350 SP/year in large cities and 75-200 SP/year in smaller communities • a service charge on commercial enterprises of 200-4000 SP/month

Source: a)

Expenditure of Several Municipalities on Solid Waste Management

Municipality	Total collected (t/day)	Inhabitants	Cost (million SP)	Cost/person (SP/year)	Cost/tonne (000SP/t)
Jbab	4	9,000	0.43	48	295
Al Zabadanee	55	25,000	4.5	180	224
Daria	40	90,000	3.0	33	205
Al Swedaa	100	100,000	178	2	5
Daraa	50	130,000	17.0	131	932
Harasta	60	250,000	20	8	91
Doma	80	250,000	15.0	60	514
Lattakia	350	350,000	70.0	20	200
Hama	250	360,000	unknown	unknown	unknown
Homs	750	850,000	110	129	402
Aleppo	1,650	2,160,000	220	102	365
Damascus	1,000	2,500,000	400	160	1,096

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on waste	?	
② Laws on hazardous waste	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.5 Energy Conservation and Alternative Energy

Electricity sector is particularly important in Syrian development activities is still widening the range of energy availability to meet the growing demand and reach remote areas. Although the efficiency in energy use is a major element to increase the output of this concern, but it is not yet on the agenda in relevant sectors and authorities.

- (1) A lack of special planning in co-ordination with source of energy and the demand of development activities
- (2) The absence of law enforcement in illegal use of electricity mainly in illegal settlements that causes about 40% of consumption not accounted for
- (3) Inefficient distribution system
- (4) A lack of awareness in efficient energy consumption and conservation methods specially in building types and isolation quality

These problems are severely affecting the economy and need to be dealt with. Other energy sources are mainly related to petrol such as benzene for vehicles and fuel for domestic heating and industry.

Alternative energy is an issue that was raised in the late 80's focused on solar energy. It did obtain some attention from decision makers who provided some measures to encourage the use of solar captures, that was exceptional in the case of soft lawns but the use of this source is still limited and does not represent a significant economical tool.

Wind energy is much less taken care of because of it's high initial cost and seasonal limits on it's availability in few areas in Syria. It could present a local solution for electrical energy in remote rural areas, but energy mass production using this method is not foreseen in the near future.

Source: a)

Related Agency
(no information)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on energy use and conservation	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.6 Water Supply

Water resources in Syria are now nearly fully exploited, the existing rate of water consumption is unsustainable and coping with further increases in water demands will require immediate and well planned action. There is some scope for further development of water storage facilities, primarily reservoirs, but this is limited by technical and geographical constraints. Also agriculture uses at least 85% of all water in Syria. This can be reduced substantially through improved irrigation methods.

Source: a)

Related Agency		
① Ministry of Housing and Utilities (MOHO)	② Ministry of Irrigation (MOI)	③ Governorate authorities

Source: a)

Options for Reducing Consumption of Domestic, Municipal and Industrial Piped Water
1) Reduction of per capita consumption through water metering and different water charge: Such water charges are already in use in some areas of Syria.
2) The use of water efficient appliances, especially in toilets, washing machines, and showers: In some cases local authorities have paid for the purchase and installation of water saving appliances.
3) Waste water reuse on a local basis in neighborhoods or apartment buildings or even individual dwellings.
4) Public awareness campaign to promote the need for conservation.
5) Discourage of high water use industries in areas with limited water supplies and move to areas with better water supplies by using different water charge between regions.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on water resources and supply	○	• Law No.16 of 1982 on irrigation
② Laws on use of water resources	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.7 Waste Water Management

(see Section 4.2)

Related Agency		
(no information)		

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on sewerage system	?	
② Laws and regulations on industrial effluent	?	
③ Effluent standard	?	
④ Results of monitoring	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.8 Forest Conservation/Desertification

At present forests cover around 2% of the total area of Syria, down from about 32% at the beginning of the century. The remaining forests are remaining mainly in the north-west mountains. Fire has destroyed 8,000 ha between 1985-1993. Also 2,440 ha of forests have been cleared to be used in agriculture between 1985-1993. The rest of the forests is endangered by several activities such as building and overgrazing. The *Pistacia atlantica* forest area which used to cover around 3,000 hectares is now reduced to a few hundred while the areas of *Pistacia atlantica* and the mixed forest in Zabadani, Madaia, Sa'agaia heights and Al-karan valley have totally disappeared. Forest biodiversity is reduced to few small areas covered by *Amygdalus*, *Pistacia Atlantica* and *Rhammus Plaestina*.

Source: a)

Related Agency
(no information)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on forest conservation	?	
② Laws and regulation on protection area	?	
③ Laws on desertification	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.9 Biological Diversity

Syria is located within the first land areas extensively occupied and cultivated by modern man. As a result there is a wide biodiversity of food plant species and great genetic diversity within these. In addition it contains fragile desert ecosystems which are very valuable.

Flora

Syria still retains a wide variety of very important plants including:

- A long number of trees species, especially fruit trees
- Old humid period species such as *Alnus Orientalis* and *Buxus longifolius*
- Alpine plants on the mountains heights

Source: a)

Related Agency
① Ministry of Agriculture

Source: a)

Protected Areas

Name of protected area	Type	Character	Area (km ²)	No. of potential species	No. of zoological species
Abdul-Aziz Mountain	Biosphere	Degraded forest	42		-
Al-Thawra Island	Biosphere	Pastures	6	80	-
Abies Cilicica & Cedrus	Biosphere	Forest	12	175	61
Al-Fronlog	Scientific research	Forest	5	170	-
Om-Al-Toyour	Biosphere	Forest + Sea	40	240	-
Karah-Douran		Forest	12.5	250	60
Al-Kalamon Mountain	National Garden	Degraded forest	150-320	100	-
Al-Bala's	Biosphere	Degraded forest		75	-
Al-Arab Mountain	Multi-Purposes	Degraded forest	3,750	230	-
Abou-Rajimeen	Biosphere	Degraded forest	600	70	-
Populus Euphratica		Forest	12	35	-
Al-Karn Valley	Cultural Heritage	Degraded forest		95	-
Al-Westani Mountain		Forest	4	70	-
Al-Jaboul Salina	Wetland	Forest	239		23 (birds)
Hzirin	Scientific	Forest	5	155	
Tlyla	Rehabilitation	Badia	22		
Bakaise	Biosphere	Degraded forest			

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on protection for fauna and flora	○	• Law No.7 of 1994 • Law No.30 of 1964 on marine resources
② Laws and regulations for protection for specific species	?	
③ Laws and regulations on hunting	?	
④ Laws and regulations on protection area	?	
⑤ Listed species in the Red Data Book	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.10 Natural Resource Management

Natural resources in general are managed through sectoral bodies or local authorities. In both cases there are no linkages between sectors to obtain integrated management.

Air quality is a particular case of which no authority is in charge. Lately, wide attention of air pollution resulted of public concern produced high level committee to deal with the current situation, but the results of this committee was limited to some regulation and recommendation on the immediate visible problems. This kind of management is usually not efficient because it is produced as a reaction to pressure that is lost once this pressure is released. There is a need for better understanding of the integrated environmental management in all resources and relevant activities.

Therefore more efforts should be spent to:

- Build the capacities of sectoral bodies
- Raise awareness of decision makers on sustainable development
- Establish a coordination body on the national level responsible of natural resources management in association with the MSE and SPC

Source: a)

Related Agency	
① Ministry of State Environment (MSE)	② State Planning Commissioner (SPC)

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on conservation of natural resources	?	
② Laws on use and conservation of mining resources	?	
③ Laws on underground resources	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.11 Natural Disasters

The notion of disaster management is not yet adopted. Further more there is no clear definition of natural disaster in comparison to other causes of emergency.

MSE participated in a regional conference and training course on Natural Disaster Management dedicated to this responsibility in the actual structure of the ministry.

According to previous experiences, eventual threats of natural causes can be summarised as follows:

- Earthquake in most Syrian regions mainly along the natural cliff crossing Damascus to Homs
- Floods; in the steeps near main rivers (Barada - Orantes - Euphrtes) and the coastal area near the mountain chain east of Lattakia and Tartous

Source: a)

Related Agency
① Ministry of Health (Hospitals & Red Crossant)
② Ministry of Interior Affairs (Fire squad, Emergency police)
③ Ministry of Defense (Civil defense & Civil army)

Source: a)

Storm
Storm is rather uncommon in Syria but occur periodically. Strong wind and heavy rain is likely to topple historic buildings. Flood and landslide is other natural events which cause severe damage or destruction, as in Palmyra in 1983 when the Valley of Tombs was inundated. As land is eroded through deforestation or loss of vegetative cover from overgrazing, the severity of damage from floods tends to increase markedly.

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on natural disaster	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.12 Environmental Education

Throughout the last decade, environmental education has become a priority in Syria. It has been included within 5-year development plans in order to establish environmental awareness and promote the use of environmentally sustainable technology. The second conference on developing preuniversity education held in Damascus in 1986 recommended that:

“Environmental education should be included in all education courses as well as their practical activities in order to establish a strong environmental education concept as well as increase environmental understanding in the teacher and student.”

This recommendation became accepted policy and resulted in environmental education taking its place within the educational system at all levels

Source: a)

Related Agency
① Ministry of Education (MOE)

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on education	?	
② Guidelines on environmental education	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

5. INTERNATIONAL RELATIONSHIP

5.1 International Convention

Name of international Convention	Year
1) Pact – Arab League States (CAIRO)	1945
2) Protocol – Tripartite standing committee on polluted waters (BRUSSELS)	1950
3) Agreement – Commission controlling the desert locust near east (ROME)	1965
4) Agreement Arab center for studies on dry and barren land	1970
5) Agreement – Arab Agriculture Development Organization (CAIRO)	1970
6) Convention on the Protection of the Mediterranean Sea Against Pollution (BARCLONA)	1976
Protocol Prevention of pollution by dumping from ships and aircrafts	1976
Protocol Cooperation of Combating pollution by oil and harmful substances in cases of emergency	1976
7) Convention – Rules Concerning Civil Jurisdiction in Matters of Collision (deposit) (BRUSSELS)	1952
8) Convention – President. Pollution of Sea by Oil (deposit) (LONDON)	1954
Amendment. (deposit)	1962
Amendment. (deposit)	1969
Amendment. Great Barrier Reef (deposit)	1969
Amendment. Tank Arrangements & Limitations of Tank Size (deposit)	1971
9) Statute – IFC (deposit) (WASHINGTON)	1955
10) Statute – IAEA (deposit) (NEW YORK)	1956
11) Convention – Limitation of Liability of Owners of Sea-Going Ships (deposit) (ROME)	1959
12) Agreement – International Development Association (deposit) (WASHINGTON)	1960
13) Convention – Safety of Life at Sea (deposit) (LONDON)	1960
14) Convention – Protecting Workers against Ionizing Radiation (deposit) (GENEVA)	1960

Source: a)

5.2 International Cooperation Project

Recent and Ongoing Donor Funded Project

Project	Executing Agency	Funding Agency	Budget (\$)	Status
Strengthen the Department of Irrigation to achieve improved management of water resources	Government	UK	1,112,462	Completed 12/1997
Integrated watershed development	Government	IDRC	313,377	Ongoing
Biological Pest Control in Citrus plantations	FAO	FAO	502,659	Completed 12/1997
Energy Efficiency and Concentration	UNOPS	OPEC	685,000	Ongoing
Assistance in decentralized rural electrification using photovoltaics	UNOPS	JICA	553,700	Ongoing
Development of Teaching Materials for Ministry of Health	Government	UNDP	119,000	Completed 12/1997
Phasing out of CFC at 5 companies	UNIDO	Montreal Protocol	557,287	Ongoing
Textiles environmental review	Spain Company	EIB	250,000	Completed 1996
Control of pollution from Baniyas and Tartous ports	Government	METAP	350,000	Completed 12/1997
Strengthen National Capacity for Environment Affairs	World Bank	Capacity 21	619,500	Ongoing
Strengthening capacity to implement Montreal Protocol	UNIDO	Montreal Protocol	235,180	Completed 12/1996
Support to national Protected zones	Government	GEF	1,000,000	Planned 1998
Coastal Zone Action Plan	MAP		400,000	Annual support
Establishment of EIA unit	World Bank	METAP	300,000	Completed 1995
National Biodiversity Action Plan	Government	GEF/UNDP	206,000	Completed 3/1997
Strengthening the capacity of the GEDs	World Bank	METAP	300,000	Completed 12/1997
Medical waste Management	Syrian Company	EU/LIFE	20,000	Ongoing
Integrated pollution control for Aleppo	Government	METAP	450,000	Ongoing

Source: a)

6. INFORMATION SOURCE

6.1 Governmental Agency

Name of Organization	Contact Address
1) State Planning Commission (SPC)	Tel: 5111481
2) Ministry of State for Environmental Affairs	Tel: 4421386 Fax: 4447608
3) Ministry of Housing and Utilities (MOHO)	Tel: 2217571 Yousef Al-Azmeh St
4) Agenda/Capacity 21 – Syria MOE/UNDP	Tel: 4447608
5) Ministry of Agriculture and Agrarian Reform (MOAAR)	Tel: 2213613 Hejaz square – Al – Naser St
6) Ministry of Health (MOH)	Tel: 3339601 Parliament St
7) Ministry of Irrigation (MOI)	Tel: 2225651 Al-Fardous St
8) Ministry of Industry	Tel: 2231845 Maisaloun St
9) Ministry Oil and Mineral Resources	Tel: 4456901 Adawi – Al – Khateeb St
10) Ministry of Culture	Tel: 3331556 Rawda St
11) Ministry of Local Administration	Tel: 22317911 Yousef Al-Azmeh St
12) Ministry of Tourism	Tel: 2215916 Fektouria-Barada Bank
13) Ministry of Planning	Tel: 2235189 Maysaloun St
14) Ministry of Transport	Tel: 3336801 Abou Rumaneh St
15) Ministry of Information	Tel: 6669600 Mezeh – Ba'ah Journal's
16) Ministry of Education	Tel: 444702 Rawda St
17) Ministry of Foreign Affairs	Tel: 3331200 Muhajreen-Shaura
18) Ministry of Interior Affairs	Tel: 222999400 Marjeh-Barada Bank
19) Ministry of Communication	Tel: 2221134 Parliament St
20) Ministry of Construction and building	Tel: 2223595 Sa'ad Al-Jabri St
21) Ministry of Awk'af	Tel: 4419080 Maysat-Sayeda Hafeza St
22) Ministry of Finance	Tel: 2224700 Mazra'a
23) Ministry of Labor and Social Affairs	Tel: 2210355 Maysaloun St
24) Ministry of Economic	Tel: 2213513 Maysaloun St
25) Ministry of Higher Education	Tel: 2129860 Mezeh
26) Ministry of Electricity	Tel: 2229654 Fektouria-Barada Bank
27) General Commission of Remote Sensing	Tel: 2218764 Fax: 3910700
28) Syrian Arab Standardization and metrology Organization	Tel: 4412725 Fax: 44505538
29) Arab Centre for Studies of the Dry Regions and Dry Lands	Tel: 6624350 Fax: 6620553
30) Youth Federation	Tel: 2124193
31) Atomic Energy Commission	Tel: 6115061
32) General Women Federation	Tel: 331107779 Fax: 3311078
33) Arab Organization for Agricultural Development	Tel: 3336945 Fax: 2218494
34) Syrian Meteorological Directorate	Tel: 6624350
35) Environmental Directorate - Aleppo	Tel: 0221-4658920 Fax: 4651299
36) Environmental Directorate - Orantes Basin	Tel: 510593
37) Environmental Directorate - Tartous Basin	Tel: 321916 Fax: 043 321917
38) Environmental Coordinator - Al-Badia Basin (Irrigation Directorate)	Tel: 031-430034 Fax: 412190
39) Environmental Directorate - Yarmouk Basin	Tel: 051-2429960 Fax: 321449
40) Environmental Coordinator - Euphrates Basin	Tel: 230511 Fax: 235513
41) Environmental Protection Committee - Orantes Basin	Tel: 511034
42) Environment Protection Committee - Euphrates Basin	Tel: 224231 Fax: 220959
43) Environment Protection Committee - Yarmouk Basin	Tel: 232635 Fax: 5116050

Source: a)

Name of Organization	Contact Address
1) Sector Ministries	
a) Agriculture and Agrarian Reform	S. el Jaabri Ave. Damascus Tel: 2213613, 2213614, 2222700 Telex: 220006
b) Communications	Majlis El Nyaby Ave. Damascus Tel: 2221133, 2227033, 2227034
c) Culture and Natural Guidance	Tel: 337467, 331557
d) Economy and Foreign Trade	Salhieh, Damascus Tel: 2213514, 2221970
e) Education	Abdul Rahman Ash Shahbandar Ave. Damascus Tel: 4444703, 4444801, 4458066
f) Electricity	Jamhuriyah Ave. Damascus Tel: 221966, 225197, Telex: 11256 MINELECSY
g) Euphrates Dam	Tel: 338314
h) Foreign Affairs	Tel: 331200/1-2-3-4, Telex: 14018 KARJASY
i) Finance	Tel: 2224700, 2216300
j) Higher Education	Rawda Damascus Tel: 330700, 330701
k) Industry	Yousef el Azmeh Square, Damascus Tel: 2213949, 721655
l) Information	Tel: 669600/1 664600/1-2
m) Interior	Marjeh Square, Damascus Tel: 2211300, 2211301
n) Oil and National Resources	Tel: 4451624, 4455826, 4445610, Telex: 11006 PETSARSY
o) Public Works	S. el Jaabi Ave. Damascus Tel: 2223596, 2223595
p) Supply and Internal Trade	(Opposite People's Assembly) Tel: 4445201, 4445204
q) State Planning	Tel: 2218853, 2227309, 2227310
r) Tourism	Abu Firas el Hamadani st. Damascus Tel: 2210122, 2215916, 2219907
s) Transport	Tel: 4435851
t) Ministry of the Environment	
u) Housing	
v) Irrigation	
w) Public Health	
x) Social Affairs	
y) Employment	
2) Scientific Institutes	
a) University of Damascus	Tichreen, Aleppo, Al-Baath
b) Scientific Studies and Research Center	
c) Civil Studies and Marine Centre in Latakia	
3) Organizations who may have useful data	
a) Civil Society	
b) Parliamentary Committee on Population and Environment	
c) Syrian Botanical Association	
d) Syrian Geographical Society	
e) Marine Research Centre	
f) General Union of Peasants	
g) General Woman Union	
h) Syrian Journalists Association	
i) Syrian News Agency	

Source: a)

6.2 Embassy

Name of Organization	Person in Charge	Contact Address
Embassy of Japan	• (no information)	• No.18 Al Mihdi Bin Baraka Street, Damascus, Syrian Arab Republic
Embassy of Syria	• (no information)	• 6-19-45 Akasaka, Minato-ku, Tokyo 107-0052 Tel: 03-3586-8977

Source: d)

Abbreviations			
ADB	Asian Development Bank	MFA	The Metropolitan Electricity Authority
AIT	Asian Institute of Technology	MET	Meteorological Department
AFTA	ASEAN Free Trade Area	MOAAC	Ministry of Agriculture and Cooperatives
ASEAN	Association of South East Asian Nations	MOI	Ministry of Industry
BAAC	Bank for Agriculture and Agricultural Cooperatives	MOInt	Ministry of Interior
BMA	Bangkok Metropolitan Administration	MOPH	Ministry of Public Health
BMR	Bangkok Metropolitan Region	MOSTE	Ministry of Science, Technology and Environment
BOD	Biological Oxygen Demand	MOTAC	Ministry of Transport and Communications
BOI	Board of Investment	MPN	Most Probable Number
BOOT	Build-Operate-Own-Turnover	MRC	Mekong River Commission
CAP	Changwat Action Plan	MS	Mekong River Commission Secretariat
CDD	Community Development Department	NEB	National Environment Board
CITES	Convention on International Trade in Endangered Species	NEPO	National Energy Policy Office
DAE	Department of Agriculture Extension	NEQA	National Environmental Quality Act
DANCED	Danish Cooperation for Environment and Development	NESDB	National Economic and Social Development Board
DBE	Department of Business Economics	NGO	Non Governmental Organization
DEQP	Department of Environmental Quality and Promotion	OAEP	Office of Atomic Energy for Peace
DMR	Department of Mineral Resources	OEPP	Office of Environmental Policy and Planning
DOO	Dissolved Oxygen	PCC	Pollution Control Committee
DOF	Department of Fisheries	PCD	Pollution Control Department
DOH	Department of Health	PEA	The Provincial Electricity Authority
DSM	Demand Side Management	PM-10	Particulate Matter < 10 µm
DTEC	Department of Technical and Economic Cooperation	RFD	Royal Forestry Department
EGAT	Electricity Generating Authority of Thailand	RID	Royal Irrigation Department
EIA	Environmental Impact Assessment	RTSD	Royal Thai Survey Department
ESCAP	Economic and Social Commission for Asia and the Pacific	SST	Science Society of Thailand
FAO	Food and Agriculture Organization	TAT	Tourism Authority of Thailand
GDP	Gross Domestic Product	TDRI	Thailand Development Research Institute
GTZ	Gesellschaft für Technische Zusammenarbeit	TSP	Total Suspended Particles
HD	Harbor Department	UNEP	United Nations Environmental Programme
IEAT	Industrial Estates Authority of Thailand	UNDP	United Nations Development Programme
IFC	Industrial Finance Corporation	WB	World Bank
IMF	International Monetary Fund	WHO	World Health Organization
JICA	Japan International Cooperation Agency	WMA	Wastewater Management Authority
LDD	Land Development Department	WWF	World Wide Fund for Nature

Source: a)

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7. REFERENCE

- a) Dr. Mamoun Fahham, 1998. Country Profile Study on Environment SYRIA
- b) World Resource Institute, United nations Environmental Program, United Nations Development Program, 1996. World Resources 1996-97 A Guide to the Global Environment.
- c) United Nations Development Program, 1997. Human Development Report 1997.
- d) Syueisha, 1996. The Asia & World Data Book.

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