Annex 3-8:
Presentation Materials for Final Seminar

3.8.1 GCEA

The Capacity Development of Environmental Monitoring at Directorates for Environmental Affairs in Governorates

Final Seminar

5-6 December 2007

General Commission for Environmental Affaires

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1. Project Sustainability

1. Recommendations by the Terminal Evaluation:

- (1) For the Remaining Period
- (2) For the Post-Project Period
- (3) Mid and Long Term Recommendations

2. Commitments on further Activities for Project Sustainability:

- (1) Confirmation of Monitoring Activity
- (2) Management System of Monitoring Activity
- (3) Confirmation toward Phase-II

2

1. 1 Recommendations by the Terminal Evaluation (1)

I. For the Remaining Period :

- (1) Continuous effort to have staff with adequate b-ground & to keep them not to change the job
- (2) Promotion of QA/QC
- (3) Fixing Lab wastewater treatment facility for normal operation

II. For the Post-Project Period :

- (1) Planning and continuation of training on air quality for the Overall Goal of the Project
- (2) Continuous contact with JICA
- (3) Beforehand application for the budget
- (4) Enhancement of the precision of Labs, such as
  - -Continuous disbursement of sufficient budget to DFEA
  - -More incentives for the lab staff
  - -Full-time technicians for lab and monitoring works
  - -Preventive maintenance of equip (periodic maintenance of AAS in the contract)

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1. 1 Recommendations by the Terminal Evaluation (2)

III. Mid and Long Term Recommendations :

- (1) Clarification of Job descriptions (roles and mandates)
- (2) Leadership of GCEA to provide technical supports to DFEA
- (3) Actual and concrete implementation of the National Monitoring Plan
- (4) Accreditation of AEC
  - -External QA/QC (program of AEC)
  - -Internal QA/QC (standard solution)

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1. 2 Commitments on further Activities for Project Sustainability (1)

Commitment of GCEA & DFEA for Continuation of Monitoring Activity

↓

Follow-up & Preparation of Data and Report

↓

Submission of Data and Documents to JICA from GCEA

A. Confirmation of Monitoring Activity

- **A-1 :Annual Report Preparation in SFY 2007**
  - -14 DFEA including BWQ, CBA, HM, and Air Q (February 2008)
  - -Summary Report by GCEA on 14 Annual Report (March 2008)
- **A-2 :Monitoring Record in SFY 2008**
  - -Monitoring Plan of 14 DFEA (January 2008)
  - -Monthly Monitoring Record of 14 DFEA through GCEA (Monthly in 2008)
- **A-3 :Equip O/M Record in SFY 2007 (March 2008)**

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1. 2 Commitments on further Activities for Project Sustainability (2)

B. Management System of Monitoring Activity

- **B-1 :Budget for Monitoring in SFY 2008 (January 2008)**
- **B-2 :Management Condition of Monitoring Activity (January 2008)**
  - -Description of Roles and Responsibilities each Directorate in GCEA
  - -Organizational Flow of Monitoring Data from D in DFEA to GD in GCEA

C. Confirmation toward Phase-II

- **C-1 :Current Situation related to Inspection Activity (January 2008)**
  - -Clarification of Authority by Laws and Regulations
  - -GCEA's Strategy & Plan for Implementation of Inspection
  - -Current Situation & Constraints for Enforcement of Inspection

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2. Prospects of Environmental Monitoring in Syria

2.1 Key Strategies of the 10th 5-years Plan 2006-2010 (Environment Management Sector) related to Environmental Monitoring

2.2 Prospects of Environmental Monitoring in Syria

- **(1) Pollution Source Management and Control**
- **(2) Environmental Monitoring Cycle**
- **(3) Collaboration with other Ministries**
- **(4) Prospects of the Phase-II**

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2.1 Key Strategies of the 10th 5-years Plan 2006-2010 (1)

1. Setting National Plans and Policies on Environmental Affaires

- **(1) Establishing national monitoring station**
- **(2) Emphasizing application of Law No. 50, 2002**
- **(3) Conducting environmental check on vehicles**
- **(4) Rationalizing usage of pesticides and fertilizers**
- **(5) Adopting national list for constrained and prohibited chemical materials**

2. Adopting EIA

- **(1) Enforcing pollutant industries to apply environmental management system**
- **(2) Setting environmental record for industrial activities**
- **(3) Setting the plan for environmental inspection**

3. Setting New Mechanism for Activating Environmental Works

- **(1) Providing all technical facilities (vehicles, labs, equip, etc.)**
- **(2) Providing typical standards (limits for environmental standards)**
- **(3) Establishing joint national program between GCEA and other ministries**

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2.1 Key Strategies of the 10th 5-years Plan 2006-2010 (2)

4. Setting Long-term Program for Staff Training

- **(1) Providing office equip and advanced labs to DFEA with working guidelines and training courses**
- **(2) Adopting the principle of continuous qualitative training to the workers**
- **(3) Conducting environmental check on vehicles**
- **(4) Rationalizing usage of pesticides and fertilizers**
- **(5) Adopting national list for constrained and prohibited chemical materials**

5. Activating Scientific Research

- **(1) Distributing equip for air pollution measurement**
- **(2) Providing actual pollution indicators conducting local specific studies**

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2.2 Pollution Source Management and Control

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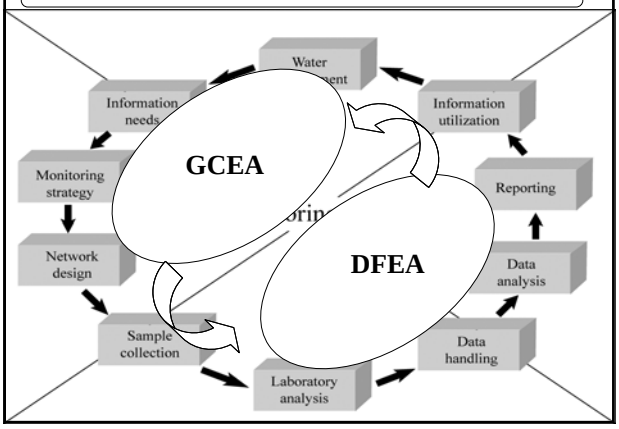
2.3 Environmental Monitoring Cycle



2.4 Collaboration with other Ministries

		Principal Objective
1) MOLAE/GCEA	⇨	**Env'tal Protection & Pollution Source Control**
2) Governor of Damascus	⇨	**Enforcement through Environment Committee**
3) SERC	⇨	**Environmental Research**
4) M. of Irrigation	⇨	**Sustainable Water Resource Use**
5) M. of Housing and C.	⇨	**Drinking Water Supply & Sanitation**
6) M. of Industry	⇨	**Compliance of Discharge & Emission Standards**
7) M. of Transport	⇨	**Traffic Volume Management**
8) M. of Health	⇨	**Protection of Public Health**

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2.5 Prospects of the Phase-II (1)

(1) Overall Goal

Monitoring and prevention of the pollution by controlling the industrial emissions in accordance with the Integrated National Environmental Monitoring Plan.

(2) Project Purpose

To solve the existing problems mentioned above.

(3) Outputs

a) Establishment of the Integrated National Environmental Monitoring Plan.
b) Trained and qualified staff are able to tackle the environmental problems on water and air using the equip provided by both Syrian side and JICA.
c) Coping with the citizen's complaints.
d) Increasing the public awareness of the citizens.
e) Laboratories accreditation to get accurate data, and
f) Publishing annual reports.

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2.5 Prospects of the Phase-II (2)

(4)Project Activities

a) Training for air and water quality analysis.
b) Pilot projects in some DFEAs for water and air quality, in order to be extend later to all DFEAs by the Syrian side efforts.
c) Training for the implementation of the national strategy for public awareness.
d) Training in using the statistical methods in result analysis.
e) Training for trainers.
f) Training for the calibration of equipment.
g) Training for the laboratory accreditation.
h) Training for inspection, EIA and other tools of the environmental management and enforcement.

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Thank You for Your Attention

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Annex 3-8:
Presentation Materials for Final Seminar

3.8.2 Damascus DFEA

- Referring to the RD singed between the government of Japan and the government of Syrian Arab Republic for the Capacity Development for Environmental Monitoring, JICA participated in the establishment of the central Lab in Damascus DFEA in Damascus Governorate.

Laboratory of Damascus DFEA

Air Section

Metrological Monitoring Station

solar radiation, relative humidity, wind direction, wind velocity and air temperature

The air section in the laboratory was provided with the following equipment:

Three metrological monitoring stations and they were distributed in three areas in Damascus governorate:

- Dummar Area: as a clean residential area.
- Jobar Area: as a residential area nearby industrial area.
- Salhia Area: representing the city center

The above mentioned stations are measuring the following parameters: solar radiation, relative humidity, wind direction, wind velocity and air temperature

Hi-Volume Sampler to measure the (PM10)

8 High volume samples four of them measuring the (TSP) and the other four measure PM10

Hi-Volume Sampler to measure the (TSP)

4 field handy samplers which measure the following parameters (SO_2 –O_3 – NH_3- NO_x)

Handy samplers to measure (SO2- O3- NH3- NOx)

4 Low volume samplers which measure PM10 less or equal 10 micron

8 dust jars which measure the falling dust during one month of installation

Simple Sampler which measures SO2-NOx

Notes	Sampling Date (months)	Dust-Jar T/km²/mon	TSP(Hi-Vol) µg/m³	PM10 (Hi-Vol) µg/m³	O_3 ppm	NH_3 ppm	NO_2 ppm	SO_2 ppm	Type of Area	Name of the sampling station	item
Electricity outlet	3-5-8-11		*	*	*		*	*	traffic	Bab Toma Square	1
Electricity outlet	2-4-7-10		*	*	*		*	*	traffic	Governorate Square	2
Electricity outlet	2-4-7-11		*	*	*	*	*	*	industrial	Qaboun	3
Electricity outlet	3-5-8-11		*	*	*	*	*	*	industrial	Ibn Asaker	4
Electricity outlet	2-4-7-10	*	*	*	*		*	*	residential	Dummar	5
Electricity outlet	3-5-8-11	*	*	*	*		*	*	residential	Jobar	6
Electricity outlet	2-4-7-10		*	*	*	*	*	*	zoo	Eastern Park	7

The Environmental Monitoring Plan

Damascus Governorate was divided into areas (with the assistance of JET) representing the following specifications:

Residential, Industrial, traffic and the Zoo. Where seven areas were selected to present the different characteristics of Damascus and the duration of the plan from 1st Jan-31st Dec 2007.

The Environmental Monitoring Plan for Damascus is summarized in following table (measurement were taken in each location with consideration that the measurements should covered the four seasons of the year).

Some measurements for PM10 over 10 microns in the selected areas according to the monitoring plan 2007

TSP(µg/m³)	Date of Sampling	Sampling Location
181	From 17/1/2007 To 18/1/2007	Jobar
153	From 6/3/2007 To 7/3/2007	Jobar
178	From 8/5/2007 To 9/5/2007	Industrial Area (Ibn Asaker)
197	From 11/6/2007 To 12/6/2007	Industrial Area (Qaboun)
154	From 4/11/2007 To 5/11/2007	Jobar
76	From 12/4/2007 To 13/4/2007	Dummar
78	From 11/6/2007 To 12/6/2007	Dummar
100 µg/m³		Allowed Limit

Measurement Results

the pollutants were measured in seven locations in Damascus governorate as follow:

Some TSP measurement in the selected locations

TSP µg/m³	Date of Sampling	Sampling locations
270	From 19/11/2006 To 20/11/2006	Industrial Area (Qaboun)
256	from 17/1/2007 To 18/1/2007	Jobar
204	From 11/6/2007 To 12/6/2007	Industrial Area (Qaboun)
211	From 26/8/2007 To 27/8/2007	Jobar
186	From 28/8/2007 To 29/8/2007	Bab Toma Square
91	From 12/4/2007 To 13/4/2007	Dummar
100	From 11/6/2007 To 12/6/2007	Dummar
240µg/m³		Allowed Limit

Some Measurements for NO2 in the selected locations according to 2007 monitoring paln

(ppm) NO_2	Date of Sampling	Sampling Location
0.100	30/5/2007	Governorate Square
0.095	12/6/2007	Governorate Square
0.005	16/4/2007	Governorate Square
0.004	8/11/2007	Jobar
No2(1h)=0.105ppm		Allowed Limit

Some Measurements for SO2 in the selected locations according to 2007 monitoring paln

So2 (ppm)	Date of Sampling	Sampling location
0.198	29/8/2007	Bab Toma Square
0.119	8/11/2007	Jobar
0.000	31/5/2007	Dummar
0.006	29/4/2007	Jobar
So2(1h)=0.132ppm		Allowed Limit

Some Measurements for NH3 in the selected locations according to 2007 monitoring plan

(ppm) NH3	Date of Sampling	Sampling Location
0.006	15/5/2007	Zoo
0.007	3/10/2007	Zoo
0.006	14/12/2007	Qaboun

Some Measurements for O3 in the selected locations according to 2007 monitoring plan

(ppm) O_3	Date of Sampling	Sampling Location
0.002	22/5/2007	Bab Toma Square
0.005	13/6/2007	Jobar
0.000	25/3/2007	Jobar
0.000	8/5/2007	Ibn Asaker
O3(1h)=0.08ppm		Allowed limit

- **The previous measurements were conducted in 2007 in the training period by JET.**
- **The previous results showed high values in TSP and PM10 in most areas.**
- **The biggest values were in the industrial and traffic congested areas.**
- **TSP, PM10 values were high in some locations due to the existence of the chimneys in winter.**

Some Measurements for Falling Dust by Dust jar in the selected locations according to 2007 monitoring plan

Dust-Full t/Km2/mon	Date of Sampling	Sampling Location
41.5	From 12/6/2007 To 13/7/2007	Jobar
13.1	From 12/6/2007	Qaboun
9.24	To 13/7/2007 From 12/6/2007	Dummar
24.9	To 13/7/2007 From 12/6/2007 To 13/7/2007	Ibn Asaker

Future Monitoring Plan

- **The preliminary monitoring plan for air quality in Damascus through measuring the air pollutants for several locations where Damascus was divided into 9 areas representing the several characteristics of the city (residential, Industrial, traffic, Zoo).**
- **(the plan is preliminary and can be modified after the training period)**
- **The following table shows the environmental monitoring plan for air quality measurements for 2008**

Main reasons of air quality pollution in Damascus is related to:

- **Traffic means.**
- **Heating means**
- **Industry.**
- **Nature of the city: shortage of green areas and parks.**
- **Informal settlement areas.**

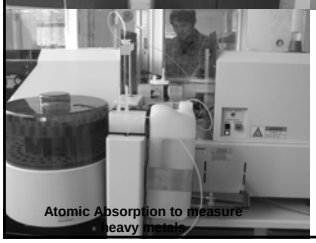
Problems and Constraints

1. **Training period for air quality was short and not enough**
2. **Adoption of some equipment that depend on absorption solutions and standard solutions which is prepared in the Lab which needs several steps to be prepared which increases the fault.**
3. **Our measurements were conducted in specific time and days and doesn't give integration**
4. **Necessity to increase the number of chemsits at the laboratory**

Note	Sampling date (months)	Dust-Jar T/Km²/mon	TSP(Hi-Vol) µg/m³	PM10 (Hi-Vol) µg/m³	O_3 ppm	NH_3 ppm	NO_2 ppm	SO_2 Ppm	Type of Area	Sampling Location	Item
Electrical outlet	1-4-7-10		•	•	•		•	•	Traffic	Bab Toma Square	1
Electrical outlet	3-6-9-12				•		•	•	Traffic	Governorate Square	2
Electrical outlet	2-5-8-11	•	•	•	•	•	•	•	Industrial	Qaboun	3
Electrical outlet	1-4-7-10	•	•	•	•	•	•	•	Industrial	Ibn Asaker	4
Electrical outlet	3-6-9-12	•	•	•	•		•	•	Residential	Dummar	5
Electrical outlet	2-5-8-11	•	•	•	•		•	•	Residential	Jobar	6
Electrical outlet	1-3-6-12	•	•	•	•	•	•	•	Zoo	Eastern Park	7
Electrical outlet	2-5-8-11				•		•	•	Traffic	Abassien Square	8
Electrical outlet	4-7-10-12				•		•	•	Traffic	Damascus Citadel	9

Thanks for your attention

Central Laboratory at Damascus DFEA



المخبر المركزي

Central Laboratory

Laboratory Divisions

- Referring to the RD singed between the government of Japan and the government of Syrian Arab Republic for the Capacity Development for Environmental Monitoring, JICA participated in the establishment of the central Lab in Damascus DFEA by presenting the equipment and required materials, the laboratory is composed of 4 divisions.

-1 Atomic Absorption spectrophotometer to measure heavy metals content in water. AAS

2- Chemical Analysis (basic, chemical and biological analysis for water quality)

3- Air Quality analysis

4- Data Management division.

Laboratory work

The analysis which can be made in the laboratory

the training was conducted for 14 parameters for basic water quality analysis.

Training was conducted for chemical and biological parameters such as Amonia, florid, total chromium, cyanide. These analysis are conducted by spectrophotometer and selected electrode

As for the training for heavy metals it includes 14 elements using furnace and flame in addition to arsenic and mercury units.

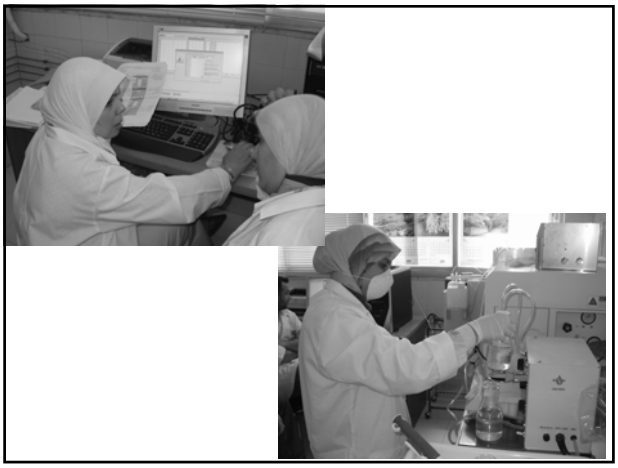
The data management division was trained for the data of basic water quality analysis, chemical and biological analysis and air quality analysis.


Field Measurements


Field Sampling


Laboratory Analysis

Activities of the C/P



Data Input

Annual Work Plan 2007

Notes	Locations	No. of Samples	Sample Type
Increase some parameters beyond the allowed limits	-1 tannery 2- Ahada Asharieh 3- Alkhomasieh Co. 4- Wella Factory 5- FA Soap factory 6- Zamzam Factory 7- Tello Factory 8- Javil Factory 9- Metal galvanizing factory 10- Halawehet Helwani Factory	10 samples	Industrial discharge water
Covering Jobar and the surrounding area	Tora Branch Daaiani Branch Akrabani Branch		Rivers

Times JAN to DEC	FREQUENCY	No. OF STATIONs	Water body
6 times	Once / 2 months	-1 tannery	1- Industrial waste water
6times	Once / 2 months	2- Ahada Asharieh	
6 times	Once / 2 months	3- Alkhomasieh Co.	
12 times	Once/ month	4- Wella Factory	
12 times	Once/ month	5- FA Soap factory	
12 times	Once/ month	6- Zamzam Factory	
12 times	Once/ month	7- Tello Factory	
12 times	Once/ month	8- Javil Factory	
12 times	Once/ month	9- Metal galvanizing factory	
12 times	Once/ month	10- Halawehet Helwani Factoy	
12 times	Once/ month	Tora Branch	2- Rivers
12times	Once/ month	Daaiani Branch	
12 times	Once/ month	Akrabani Branch	

Annual Plan 2007
Heavy Metal Analysis

Samples			Period yyyy	2007						2008					
			mm	7	8	9	10	11	12	1	2	3	4	5	6
DFEA	No.	Name													
Damascus	1	ihda'ashareea				a				a			a		
	2	wella					a				a			a	
	3	dappaghat				a				a			a		
	4	fa					a				a			a	
	5	alarabi washing car					a				a			a	
	6	khomasia				a				a			a		
	7	bab sharqi dying						a				a			a
	8	gallab						a				a			a
	9	zamzam						a				a			a

After Setting the annual monitoring plan for 2007 and commitment to it as possible due to the dense training by JET, we managed to monitor some parameters according to the selected sampling stations within the plan and the following some results which indicates to the pollution:

The analysis indicated high values of the pollutants in some areas in Damascus and as an example when analyzing waste water discharged to the public sewage network for a beverage factory

Parameter	Analysis	Standards
COD	2200 mg/l	1600 mg/l
SS	69 mg/l	500 mg/l
Temperature	28 C °	35 C °
PH	10.24	6.5-9.5
NH3-N	-	100 mg/l
PO4	40 mg/l	20 mg/l

As for the analysis when discharging to the river some analysis showed high increase in the pollutants. As an example when sampling from the discharging point to Barad River from the metal factories

Parameter	Analysis	Standards
COD	350 mg/l	150 mg/l
SS	250 mg/l	30 mg/l
PH	7.8	6.0- 9.0
NH3-N	44 mg/l	5 mg/l
PO4	13.5 mg/l	14 mg/l
DO	14.14 mg/l	4 mg/l

mm - yy		June - '07		Administration No. 0706-10				Name of DFEA (or Client)		
				01	02	03	04	05	06	07
Item	QL	Std-dr /Std-dc	Unit	ihda'ashareea	wella	dappaghat	fa	alarabi washing car	khomasia	bab sharqi dying
Ag	0.002	- / 0.05	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Al	0.005	0.2 / 1	mg/l	0.077	1.6	1.8	1.8	4.4	1.2	0.79
As	0.005	0.01 / 0.1	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ba	0.5	0.7 /1	mg/l	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5
Cd	0.0001	0.003 / 0.01	mg/l	<0.0001	<0.0001	<0.0001	0.0001	0.0019	<0.0001	0.0001
Cr	0.001	0.05 / 0.5	mg/l	<0.5	<0.5	>5.0	<0.5	<0.5	<0.5	<0.5
Cu	0.5	1 / 1	mg/l	1.7	1.0	<0.5	<0.5	<0.5	<0.5	<0.5
Fe	0.25	1 / 0.3	mg/l	1.2	1.6	21	4.6	16	<0.25	0.48
Hg	0.0005	0.001 / 0.005	mg/l	0.0007	0.0008	0.0009	0.0007	0.0010	0.0014	0.0007

The DFEA of Damascus is trying to achieve the following through the operation plan

1- Capacity Development for Sampling and analysis
2- Management and operation of the Laboratory
3- Administration of Environmental Monitoring Data
4- Planning and implementation of the Environmental Monitoring
5- Data Publication and Environmental Education

Activities of the Central Lab

- Training other DFEA staff on the analysis and so we publish our skills to others
- Continue participation in the program of AEC for QA/QC and we will continue in 2008.
- OM manual for the laboratory will be used with the continuous inventory for the reagents and chemicals at the Lab.

- **استقبال عينات من باقي المديريات في كافة المحافظات وفقا لخطة تم وضعها من قبلنا وذلك لاجراء التحاليل الكيميائية وتحاليل الامتصاص الذري**
- **بالنسبة لمحطة المعالجة الخاصة بالمنصرفات المخبرية والموجودة ضمن مديرية شؤون البيئة بدمشق فلا يزال الوضع معلقا بالرغم من استلام بعض المنصرفات المخبرية من باقي المحافظات**

Difficulties and constraints for the Central Lab

- Difficulties to deal with the water distillation unit existed in the Lab because it needs long time for monitoring as well as its capacity is not enough to cover the daily needs of the Lab.
- Experience shortage in dealing with the selected electrode equipment
- Necessity to follow up the WWTP in the Lab.
- There is a need for power generator due to the power failure
- There is a need to have CD copier and scanner associated with the data management computer.
- Shortage in the technical qualified staff
- There is a need to expand the lab area due to the increase in the laboratory work.

Priority Environmental Issues within Damascus DFEA

1. Studying the EIA for the activities within Damascus Governorate.
2. Monitoring all activities which have impact to check their commitment to the standards.
3. Granting the environmental licenses for the activities in Damascus depending on law No.50 and by law
4. Supervising the laboratory work at the DFEA and training the staff to be ready for any emergency work
5. Conducting other required works to keep the environment clean within Damascus Area.

6. Identification all Environmental problems in Damascus related to water, air, solid wastes and chemical safety in coordination and cooperation with the related agencies to find solutions to deal with them.
7. Respecting the laws and regulations issued by the ministry and the environmental standards in Syria.
8. Conducting Public awareness and environmental education within Damascus Governorate
9. Participation in the studies and researches to keep the environment clean
10. Other functions related to the safety of environment which other departments are not responsible for.
11. Administrative, legal and financial Mandate of the DFEA

Thank you for your attention
with the compliments of Damascus DFEA

Annex 3-8:
Presentation Materials for Final Seminar

3.8.3 Damascus Countryside DFEA

- The laboratory was established in DAMC DFEA in 2005 and it has at that time 6 staff who have no previous experience in the environmental field.
- JET provided the Lab with basic water quality analysis
- In addition to the reagents and required tools for the laboratory work.

DFEA in Damascus Countryside

أجهزة قياس الهواء

- GCEA provided DAMC with mobile equipment for air quality such as stuck gas, diameter and concentration of dust , measurement of gases within the environment of the work, etc.

PH Meter

Measurement in the Mobile Lab

JET Lectures

- JET started the theoretical training through lectures to the laboratory staff.
- Then training started on the usage of equipment and sampling in addition to field measurements.

Practical training in the Lab

- Training was conducted at the DFEA Lab for the following parameters
- TUR
- Color
- SS
- COD
- BOD
- NO3
- PO4
- CL
- NH3

Field Measurements

Sampling

- The training continued in 2007 for basic water quality analysis and concentrated for QA/QC by using standard solutions, while other parameters were added to the training program for biological and chemical analysis using the spectrophotometer and oil content meter

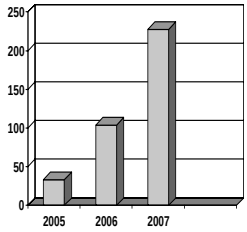
- The training continued in 2006 and concentrated for QA/QC in addition for reagent storage and other related matters
- Training concentrated on Data Management and how to keep the analysis results.

- The work was developed in the DFEA and the capacities increased in sampling and analyzing and usage of standards solutions for QA/QC.
- The capacity increased as well in the data interpretation and preparation of the Environmental Monitoring Plan.

Spectrophotometer

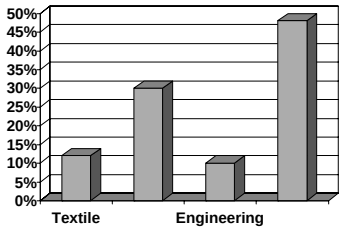
Oil content meter

- Damascus countryside governorate has more over than 16,000 industrial establishments varying textile, chemical, engineering, etc. and they are distributed in the governorate randomly.



- Number of Samples collected in 2005 is 33 while in 2006 become 133 and the number was in 2007 to the date 227 samples.

- The Damascus Countryside Governorate is facing a real problem from sewerage where this water is directly discharged to surrounding environment where farmers are receiving it and use it for irrigation which caused the pollution of ground water and to stop many ground water wells which are used for drinking due to the increase in the Nitrite content.
- Water discharges from the hospitals and touristic activities without any treatment.



- Due to the DFEA works during the previous period:
- Many companies started the installation of waste water treatment plants. And they tried as well to apply the environmental management tools in some establishments.

Sewerage

- The DFEA procured GC, AAS and the DFEA are under training now, in addition a new mobile lab to measure the air quality
- The total amount of the above mentioned equipment is 25 millions sp paid from the DFEA budget.

2007	***2006***	***year***
7.3	11.9	**PH**
9500	8226	**TDS**
172	22625	**COD**
80	4000	**BOD**
0.8	25.8	**NO3**
1050	5283	**CL**

- Changes in water quality parameter results for some factories (one of the chemical factories

Connecter of the mobile lab when transporting

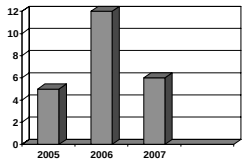
Air quality mobile Lab

AAS

Cabinet for Chemical Reagents

Front of air quality mobile lab

Obstacles of the Lab work



Changes in the number of Laboratory staff

- -Staff is not stabilized
- One driver only
- No incentive for the laboratory staff
- Laboratory accreditation by the high supreme for environment protection

GC

Thanks for your attention

We propose for the next phase

- Necessity of Laboratory accreditation especially basic water quality analysis
- Increasing the laboratory staff
- Giving the laboratory staff incentives
- Increasing the capacity of the laboratory staff by training them the expected pollutants from each type of industry
- Training course for reagents preparation
- Training the laboratory staff for the safety of the laboratory.

Annex 3-8:
Presentation Materials for Final Seminar

3.8.4 Allepo DFEA

The Capacity Development of Environmental Monitoring at Directorates for Environmental Affairs in Governorates in S.A.R

Aleppo DFEA

JICA

Objective of the project and current situation

* this project purposes for monitoring wastewater basically resulted from industries in Aleppo Governorate
* Monitoring domestic water
* Monitoring Air Quality in Aleppo City
* Number of employees in DFEA is 26
* 6 of them work in the lab for water & air quality and data management (full and part time)

Water Quality Activity

JICA Experts:

Mr. MATSUE

Mr. SATO

Mr. SAKAE

Counterparts:

Chemist Ahmad Ahmad

Mr. Mohammad Hamade

Eng. Mohammad Rasheed

Water Quality Activity

Water lab equip.

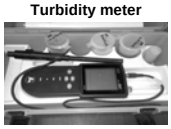

Field Spectro


TDS ,EC meter


Turbidity meter


Chloride meter


BOD incubator


PH meter


Oil content meter


Refrigerators for saving samples


COD incubator

Water Quality Activity

Parameters to be measured

1- weather, 2- air temperature, 3- water temperature,
4- width of sampling station, 5- water depth of sampling station,
6- flow rate speed, 7- odor, 8- pH, 9- color, 10- dissolved salts,
11- TSS, 12- COD, 13- BOD, 14- NO_3, 15- NO_2, 16- PO_4,
17- CL^-, 18- ammonia, 19- EC, 20- turbidity, 21- DO,

odor – pH – Color – TDS – SS – COD – BOD – NO2 – NO3 – PO4 – Cl – EC – DO - Turbidity

We measured the following parameters in the last stage of the project:

1- SO_4, 2- detergents, 3- Mg hardness, 4- Ca hardness,
5- total hardness, 6- hexavalent chromium, 7- total chromium

Water Quality Activity

From the beginning of the project until now, Aleppo DFEA has carried out the following activities:

Water quality:

1- industrial wastewater:96 samples (different industries)

2- domestic wastewater: 4 samples (TSP)

3- underground water: 4 (Wells)

Water Quality Activity

some Environmental Monitoring results

Cl Mg/L	TDS Mg/L	DO Mg/L	PO4 Mg/L	COD Mg/L	BOD Mg/L	PH	Factory
451	1028	4.5	5.7	1507	622	11.2	Medicine factory 15 m^3/day
633	1238	2.3	175	1306	718	10.6	Detergents factory 40 m^3/day
8440	16958	2.5	50.7	7290	5320	13	Tannery 300 m^3/day
600	2000	>4	20	1600	800	-6.5 9.5	Syrian Standard

Water Quality Activity

some Environmental Monitoring results

Chromium total الكروم الكلي Mg/L	Chromium Cr6+ الكروم السداسي Mg/L	Hardness Total القساوة الكلية Mg/L	Hardness Ca قساوة الكالسيوم Mg/L	Hardness Mg قساوة المغنزيوم Mg/L	Detergents المنظفات Mg/L	Sulfide السلفات Mg/L	Factory
0.001	0.001	95	12	83	0.91	0.012	Aleppo TSP
0.001	0.001	68.0	27	68	0.051	0.51	Tannery in Sheikh Said
0.001	0.001	56.0	0.4	56	0.037	0.001	Well in Al-Ramouse
2	0.1	-	-	-	5.0	2	Syrian Standard

Water Quality Activity

sampling & field and lab analyzing

Air Quality Activity

<u>JICA Experts</u>

Mr. HIRAU

<u>Counterparts:</u>

Eng. Ilia Wasel

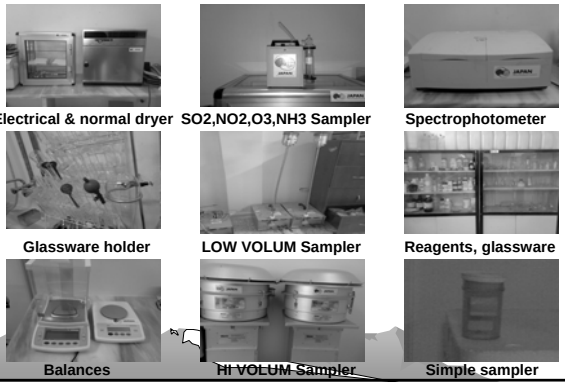
Eng. Dina Ghareeb

Eng. Kholoud Ouayed

Chemist Mahmoud Ismael

Air Quality Activity

Air lab equipments:



Electrical & normal dryer | SO2,NO2,O3,NH3 Sampler | Spectrophotometer

Glassware holder | LOW VOLUM Sampler | Reagents, glassware

Balances | HI VOLUM Sampler | Simple sampler

Air Quality Activity

pollutants which can be measured:

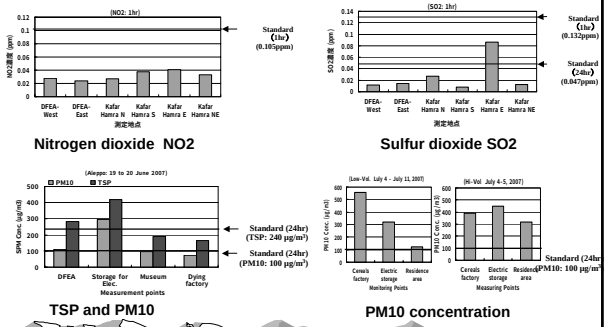
NOx ,SO2 , NH3 , O3 , PM10 ,DUST, TSP

3 meteorological stations were installed in (city center, Shkayyef, Sheikh Said) which can measure (wind speed, wind direction, relative humidity, solar radiation, and temperature)

8 locations in Aleppo city were selected to measure the above mentioned pollutants, which represent traffic, industrial, and residential areas, in addition to a reference point. these locations are: (wastewater treatment plant in Al Ramouse, Electric store in Sheikh Said, the museum in the city center, university square, Trab Alhullok Street, Shkayyef, Kafar Hmra, and the DFEA)

Air Quality Activity

some Environmental Monitoring results



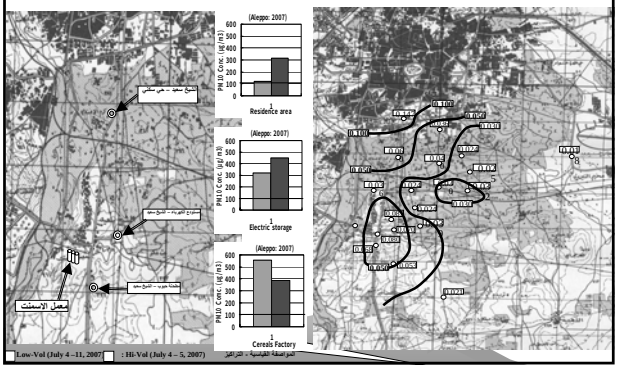
Nitrogen dioxide NO2 | Sulfur dioxide SO2

TSP and PM10 | PM10 concentration

Air Quality Activity

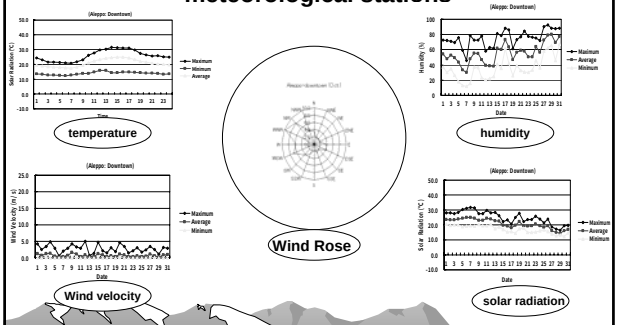
some Environmental Monitoring results

Sampling points of PM10 with concentrations | Sampling points of NO_2 in some areas, pollution ma



Air Quality Activity

some Environmental Monitoring results – meteorological stations-



Data Management activities

JICA Experts:
Mrs. HANAE
Mr. TAKAHASHI

Counterparts:
Eng. Ilia Wasel

- All data of water and air quality analyses are put in regular records, and stored in special files in the PC of Data Management
- meteorological data are collected periodically and saved in special files, so that it can be treated and used when analyzing air pollutants concentrations
- Data is sent to GCEA periodically by CDs until completion of networking connection with GCEA

Main problems, difficulties need solutions

The main problems that face lab work and Environmental monitoring in Aleppo DFEA are:

1- big number of industrial establishments which pollute the Environment, and spread on a huge area the matter which affect implementation of EMP negatively

2- shortage in staff especially chemists

3- networking connection between Aleppo DFEA and GCEA is not available currently

Suggestions and recommendations

Some suggestions to solve the problems in the Governorate:

1- encourage the manufactures to follow new production methods and use friendly techniques to the Environment to reduce wastes resulted from their establishments and aware them about the pollution comes from their establishments.

2- set a special budget for lab materials and incentives

3- increase the number of qualified staff (especially chemists)

4- increase the number of air pollution parameters and the time of training on them

The future plan
future results – data - connection

1- Data of Environmental Monitoring results is accumulated in excel sheets in the DFEA and GCEA
2- completing the connection between DFEA and GCEA to exchange information and data
3- participate in the AEC program to accredit our lab
4- prepare an annual future plan to monitor pollution resources
5- a new system to store information and analyses data was set
6- issue a report about the environmental situations in the sampling areas
7- applying public awareness against the dangers using these results

The Capacity Development of Environmental Monitoring at Directorates for Environmental Affairs in Governorates in S.A.R
2005 - 2007
Aleppo DFEA

JICA

Annex 3-8:
Presentation Materials for Final Seminar

3.8.5 Homs DFEA

The project on Capacity Building of Environment Monitoring at Homs DFEA

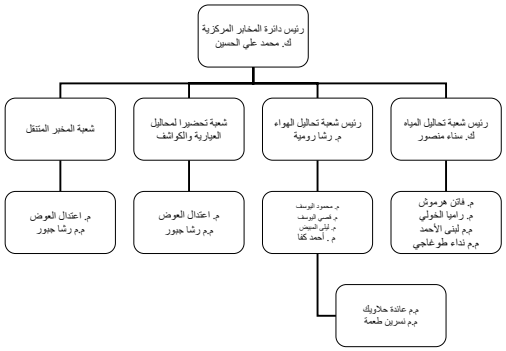
By

Director of Homs DFEA

Director of Laboratories at Homs DFEA

Homs DFEA building

Organisational Chart of Lab directorate



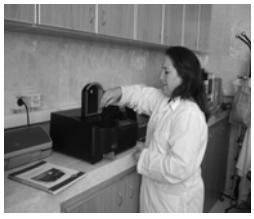
Organisation Charts

Priority topics of Environment in Homs

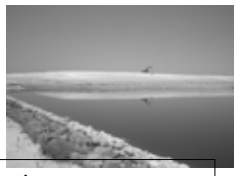
1- the contamination related to fertilisers factory and Kattina lake contamination

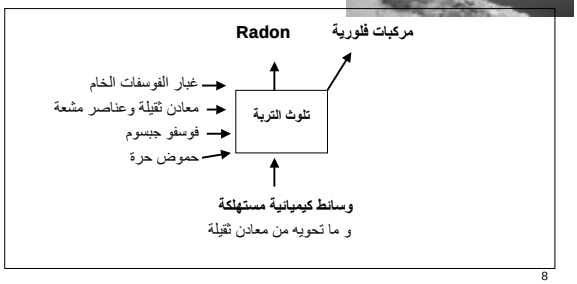
The factory complex is consisted of 3 facilities

TSP plant	A V plant	C. A . N .plant
2×850 طن / يوم حمض كبريت 600 طن / يوم حمض فوسفور P2O5%100 1500 طن /يوم سماد سوبر فوسفات ثلاثي T .S .P	1000 طن أمونيا / يوم 1050 طن يوريا / يوم	150 طن/يوم امونيا 120 *2 طن/يوم حمض أزوت



2- To soil





8

The fertiliser factory emits pollutants to;

1- Air

- **Fluoric compounds**
- **So2, and SO3**
- **Nox**
- **N2O**
- **T.S.P dust**
- **Dolomite dust**

7

2- contamination caused by Oil refinery

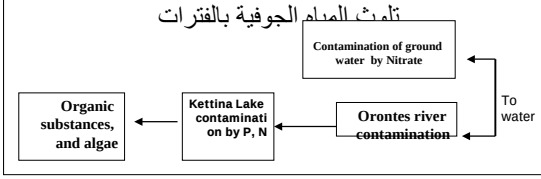
Caused by
VOC, and H2S
Contamination of water with oil and grease
Contamination of soil with oil and grease and hydrocarbons
Contamination with coal

10

3- To Water

Waste water discharged to Orontes river

تلوث المياه الجوفية بالفترات



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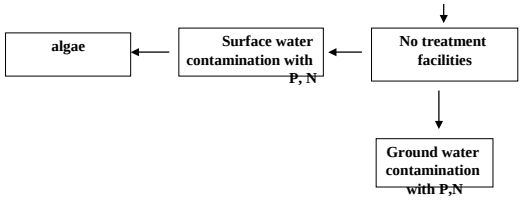
4- water contamination of smaller towns



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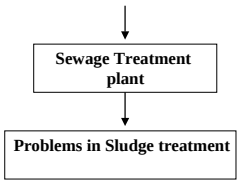
3- Odors in Homs City



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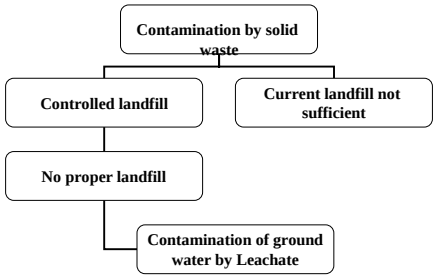
6- contamination by Solid Waste



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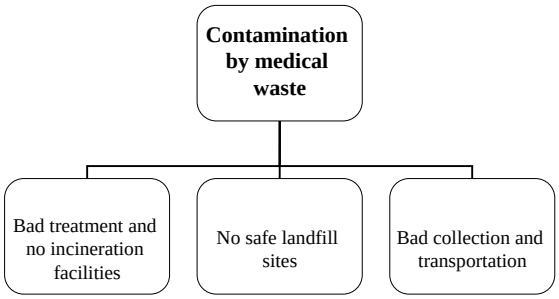
5- Contamination by Medical waste



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The skills of DFEA staff

The staff capacity of Homs DFEA is good, there is some space for improvement

1- chemical interventions

2- QA, and QC which will require further capacity development

16

7- contamination by olive oil processing factories waste water

The effluent of such facilities contain

- Phenol
- High COD
- High TKN

all cause the contamination of soil, surface and ground water

15

Lab status, equipment, chemicals and reagents inventory management

- operation, use of SOPs, chemicals and reagents management is good
- Maintenance
  - The staff has to acquire information on calibration, and maintenance management
  - Supplier has to undertake regular check during the warranty period 4-5 times / year and conduct necessary maintenance

18

Self Training and Capacity building within JICA project

1- English courses

2- course by Atomic Energy Commission on AAS

3- Continuous and on the Job training

4- cooperation and coordination with directorate of training to take any available training opportunity offered to DFEA

5- PC courses

17

Suggestions to improve the performance of DFEA

1- improvement of preparation of standard solutions by procurement of water deionizer

2- procurement of AAS to analyse heavy metals resulting from fertilisers and oil refinery industries… etc.

3- more budget from GCEA to procure reagents for air quality monitoring

4- more budget from GCEA for transportation

5- to ask JICA to provide soil analysis lab

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Environmental Monitoring

Monitoring of pollution sources is just one of the responsibilities of the DFEA, so performance is affected by other responsibilities which are

1- Environmental inspection

2- EIA

3- handling complaints

Some air monitoring equipment need constant electrical power supply, and this is not always available and affecting air quality monitoring

Other handy equipment, are easier to utilise, and work fine

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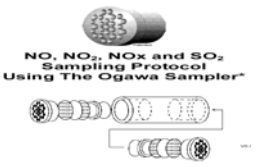
- Training duration on air quality monitoring was short, specially knowing that staff had no experience before in the filed
- The training didn't cover NH3/HF/H2S/O3
- As air pollution is a complicated science, and measurements vary from season to season, and related to climate… we need more training, as the training provided didn't cover these complications



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Comments on Air quality monitoring

Efficiency of Equipment provided by JICA

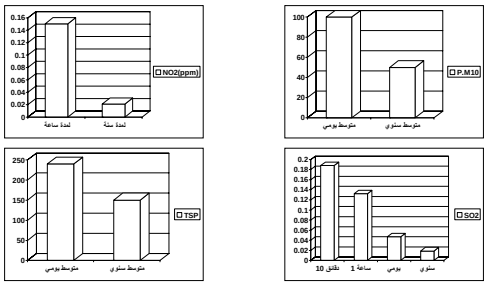
- Method is credible
- Requires long time for preparation of solutions and reagents
- Requires staff for transportation of solutions to and from the field
- Requires long time to measure absorbance using the spectrophotometer
- To improve the performance we suggest the provision of more handy samplers (12 for instance) IN ORDER TO COVER THE REQUIRED AREA

Passive samplers can only measure NO/NO2/NOx, we need similar samplers to measure O3, NH3, SO2, SO3

21

Capacity Building within JICA Project

Air Quality standards (example)



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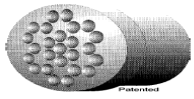
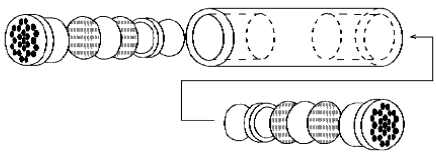


NO, NO_2, NOx and SO_2 Sampling Protocol Using The Ogawa Sampler*



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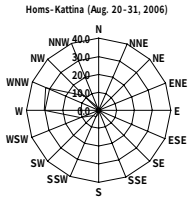
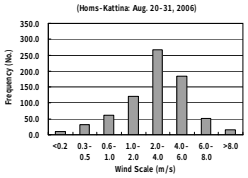
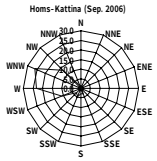
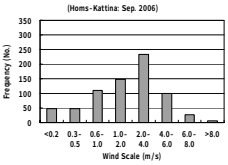
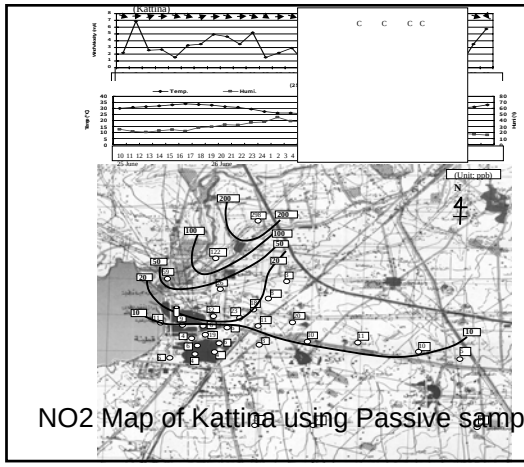










NO2 Map of Kattina using Passive samplers

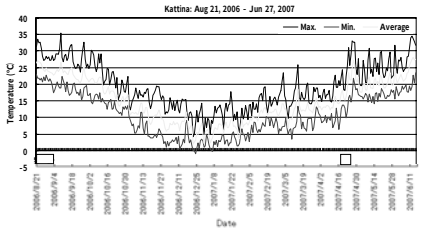
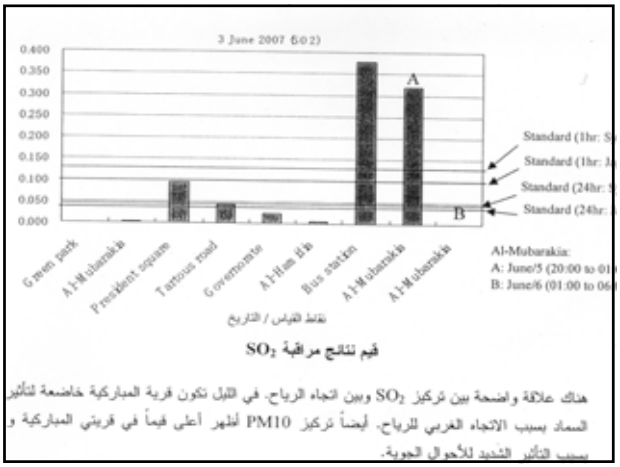


Figure 2.2 Daily change of the maximum, minimum and average temperature



قيم نتائج مراقبة SO_2

هناك علاقة واضحة بين تركيز SO_2 وبين اتجاه الرياح. في الليل تكون قرية المباركية خاضعة لتأثير السماد بسبب الاتجاه الغربي للرياح. أيضاً تركيز PM10 أظهر أعلى قيماً في قريتي المباركية و بسبب التأثير الشديد للأحوال الجوية.

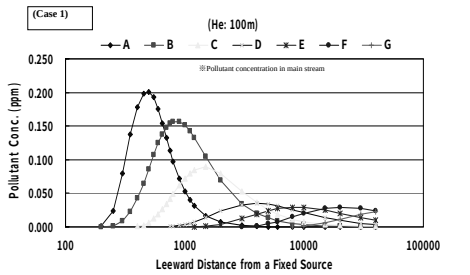


Figure-3(1) Relation between Atmospheric Stability and Pollutant Conc. (He: 100m)

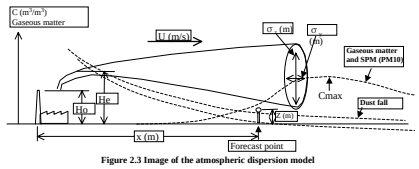
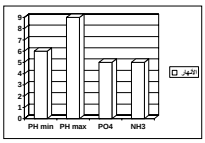
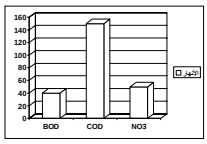


Figure 2.3 Image of the atmospheric dispersion model

Orontes River Monitoring Results

- We measure the following parameters and compare against standards
  - pH
  - EC
  - TDS
  - NO2
  - NO3
  - PO4
  - S
  - COD





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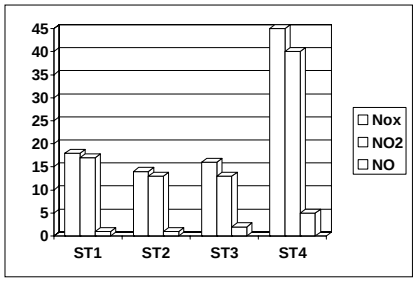
Air Monitoring Results of March 2007 (ppb)



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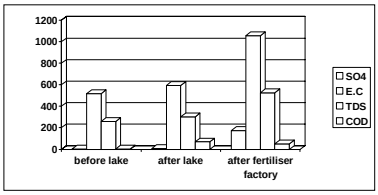

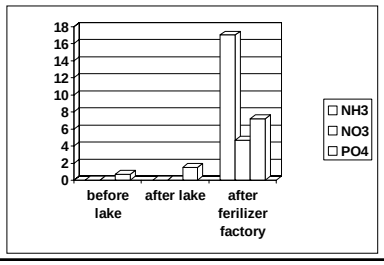

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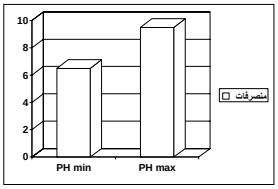
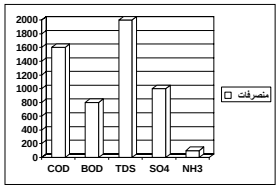
Standards of allowed disposed sewage to rivers





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Thank you for your attention

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