ENVIRONMENTAL STATISTICS & ECONOMIC ACCOUNTING IN LEBANON

Ministry of Environment &
Central Administration of Statistics (Ghalia Hamamy)
October, 2009

Outline

- MOE Presentation
  - Lebanese Environment and Development Observatory (LEDO) Indicators
  - Cost of Environmental Degradation (COED)
  - Public Expenditure Reviews (PER)
  - Type of accounts
  - Limitations
  - Recommendations

Outline

- CAS Presentation
  - SEEA Economic Agents
  - SEEA Chapter 8
  - Questions we should ask in Lebanon regarding climatic change

Lebanese Environment and Development Observatory (LEDO)

- 90 indicators divided into 4 categories:

1-Population / 30 indicators

2-Economic Activity / 17 indicators

3-Environment / 30 indicators

4-Sustainable Development Activities / 13 indicators

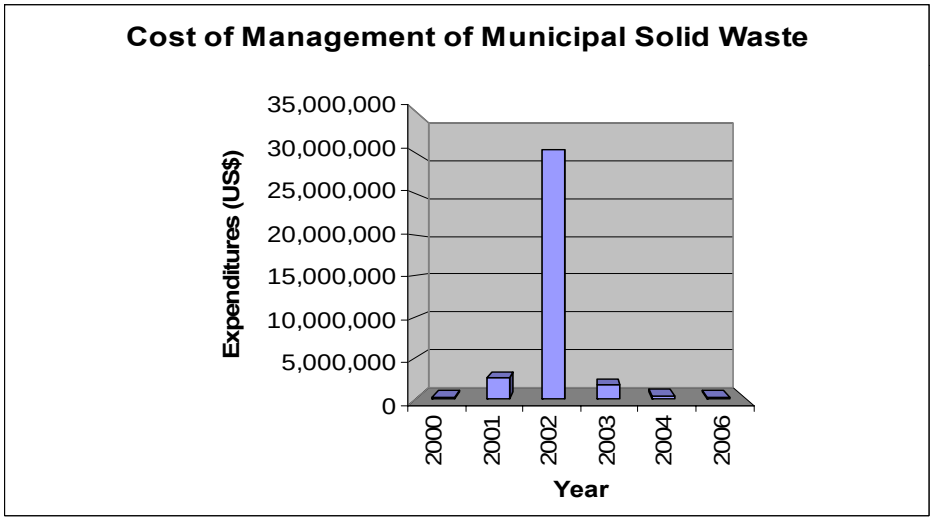
LEDO Indicators related to Environmental Expenditures

- Public expenditure on environmental protection as a % of GDP
- Cost of management of municipal solid waste
- Total expenditures on protected areas
- Expenditure on wastewater management by type (domestic/industrial)

LEDO Indicators

- Cost of management of municipal solid waste

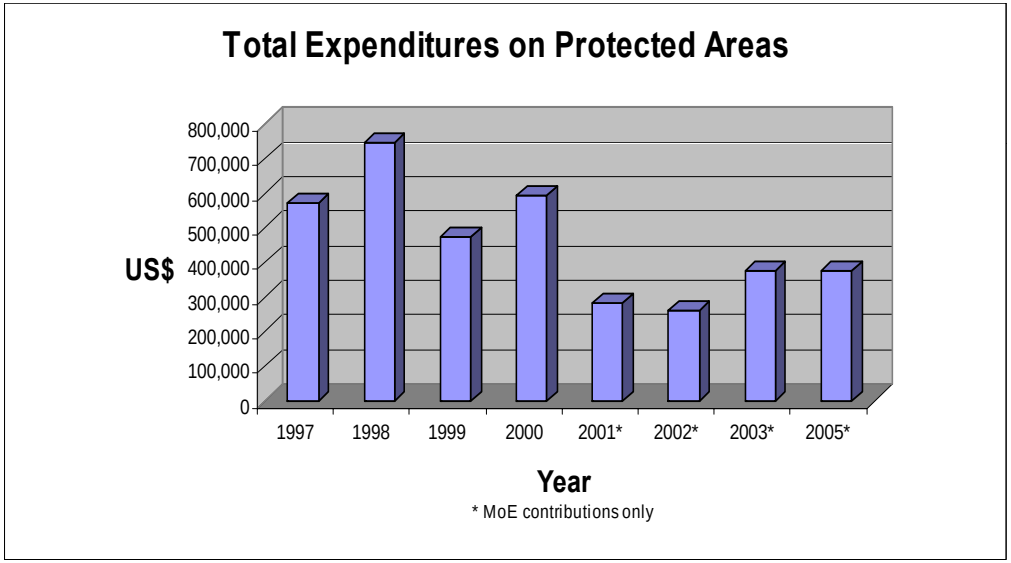
Year	Amount (US$)
2000	312,772
2001	2,580,106
2002	30,256,680
2003	1,761,000
2004	367,490
2006	196,375



LEDO Indicators

- Total expenditures on protected areas

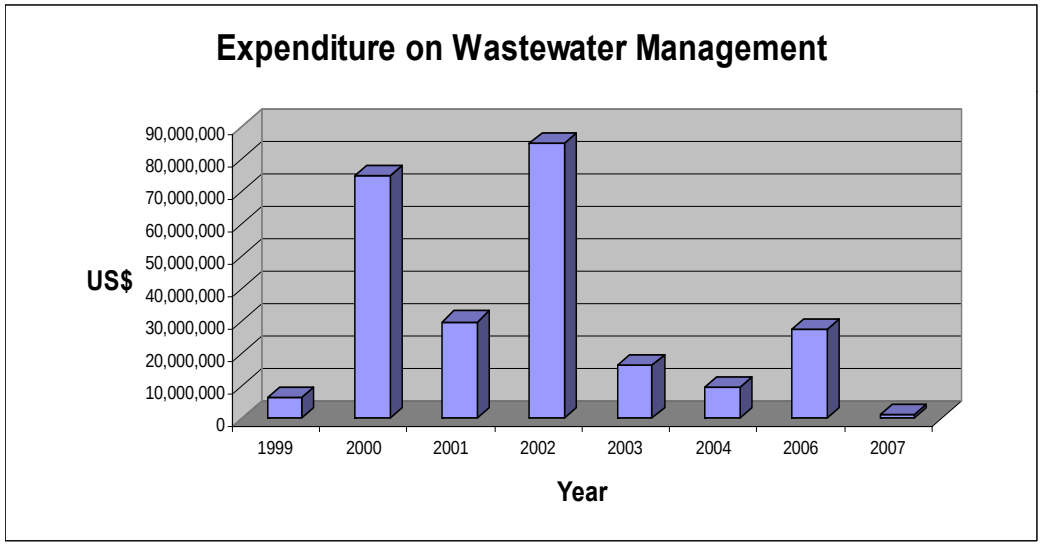
Year	Amount (US$)
1997	572,854
1998	748,709
1999	475351
2000	593,993
2001*	280,000
2002*	260,000
2003*	373,333
2005*	373,333



LEDO Indicators

- Expenditure on wastewater management by type

Year	Amount (US$)
1999	6,500,000
2000	75,174,454
2001	29,954,647
2002	85,163,064
2003	16,483,003
2004	9,757,732
2006	27,446,518
2007	1,058,326



Cost of Environmental Degradation (COED)

- History:

  The process of COED assessment in Lebanon started in 2004.
- Objectives:
  - Use of environmental damage cost assessments for setting priorities;
  - An instrument for integrating environmental issues into economic and social development;
  - To quantify and monetize the cost of degradation across a wide range of environmental issues;
  - A tool for mainstreaming environment and convincing policy makers;
- Partner: WB/METAP

Cost of Environmental Degradation (COED)

- COED 2004 (based on 2000 data)
- COED 2008 (July War 2006)
- COED 2008 (Forest Fires)
- COED 2009 (Northern Coastal Zone, based on 2005 data)

Cost of Annual Environmental Degradation in Lebanon, 2000

	US $ millions per year	*Percent of GDP*
Air	170	1.02
Water	175	1.07
Land and wildlife	100	0.60
Coastal zones and cultural heritage	110	0.68
Waste	10	0.05
Sub-Total	**565**	**3.4**
Global environment	90	0.5
Total	**655**	**3.9**

Cost of Environmental Degradation Due to July 2006 Hostilities

Impact	**USD million Average**	**% GDP**
Waste	290.2	1.4
Oil Spill	203	1
Water	131.4	0.6
Quarries	95.5	0.5
Forests	8.9	0.0
Air	n.a.	n.A
Total Environmental Cost caused by hostilities	**729**	**3.6**

COED of Lebanese Northern Coastal Zone

- The study is the first-time published attempt to estimate cost of environmental degradation not on a national level but on local level and of a specific ecosystem and physiographic division i.e. coastal zone
- The study was faced by *data scarcities; t*herefore, it carries many limitations.
- The study is believed to provide more accurate estimations of cost degradation than the national studies as it relied on data from sources in the area of study.
- The study was carried by WB/METAP in association with the SMAP III project and EC delegation in Egypt with funding from the Finnish Trust Fund.

COED of Lebanese Northern Coastal Zone

Impacts	**Average (USD million)**	**% of GDP**
Water Resources	37.6	1.5
Air	33.8	1.3
Land use	18.1	0.7
Quarries		
Solid waste		
Regional waters	8.5	0.3
Fisheries		
Biodiversity	4	0.2
Total	**102**	**4.1**

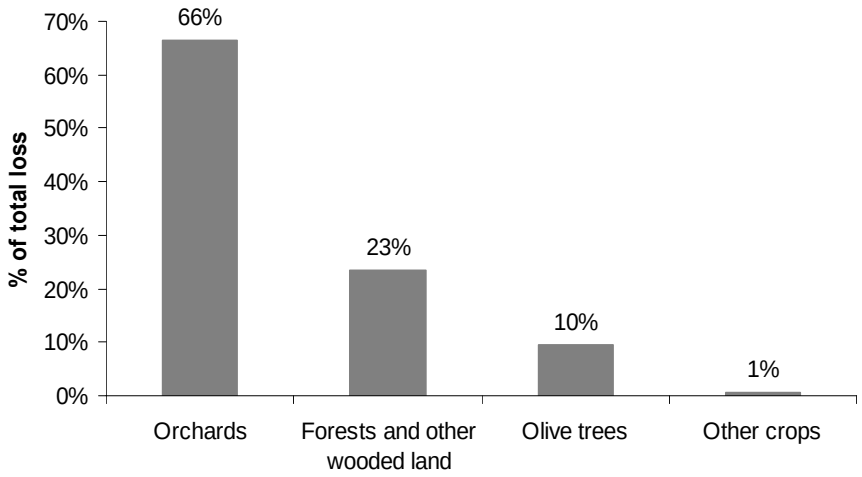
Analysis

- Air and water cost of degradation in both the NZ study and COED 2000 rank first
- The cost of degradation of the coastal zone COED 2000 is $110 million and in the NZ study is $102 million

=> therefore the national degradation estimates are represented on local scale

Cost Assessment of Forest Fires of October/November 2007

Land Use	USD million average
Orchard	20.6
Forest & other wooded land	7.2
Olive trees	3.0
Vegetables, cereals, crops	0.2
Other land	0
Total	**31.1** (1.25% of GDP)



Public Expenditure Reviews (PER)

- World Bank conducted 3 PERs:
  - Electricity
  - Water
  - Agriculture

- Currently MoE & World Bank are conducting a Country Environmental Analysis Study including a Public Environmental Expenditure Review (PEER)

Type of accounts

	Data availability	Source of data
Pollution (waste, emissions)	Emissions from cement industries Air emissions in North (TEDO) Effluents from olive oil sector	MoE TEDO
Asset accounts	Protected areas (area)	MoE
Economic Information on the environment		CoED studies/ Cost-benefit analysis studies
Expenditures	Water Electricity Agriculture Environment	PER (WB) MoF CDR
Revenues/Taxes	Quarries Solid waste Mecanique Water Eelectricity Public maritime domain	MoE Municipalities CDR MoIM WA, MoEW, EDL MoPW

Limitations

- Lack of data on assets;
- Emissions accounts are difficult to compile given the insufficient environmental monitoring systems and lack of environmental reporting;
- Lack of a coordination mechanism and/or data sharing;
- Poor data quality;
- Low response rate;
- Lack of updated information (e.g. SoER, CoED, etc…);
- Lack of financial resources;
- Availability of institutionalized human resources to implement the system.

Recommendations

- Research/surveys on natural assets;
- Monitoring of environmental pollutants;
- Capacity building of human resources;
- Improving reporting system;
- Improving coordination among different stakeholders;
- Awareness raising about environmental accounting at different levels (government, private sector, academia, general public, etc…);
- Mobilization of financial resources.

THANK YOU ☺

SEEA Economic agents

- Establishments classified by ISIC: we should include in economic surveys in Lebanon questions related to environment protection expenditures (investments + current expenditures) for pollution treatment and prevention purposes.
- Households
- Government sector: most of the environment statistics are provided by public sector such as MOE, MEW and CDR. CAS is only an environmental statistics user.
- Rest of the world: imported pollution form other countries.

SEEA – Chapter 8

- Chapter 8 – Specific Resources Accounts should be a priority for Lebanon especially when dealing with:
  - Water resources: Water and Waste Water Establishments started providing a standard format of water data in 2008.
  - Aquatic resources especially after 2006 Israeli aggression oil spill.
  - Forests: should be a priority especially after enormous forest fires in Lebanon since 2004.

Forest fires in Lebanon (2004-2008)

(Source: Ministry of Environment)

Ha burnt by Mohafazat / الهكتارات المحروقة بموجب المحافظة	Year 2004 / سنة 2004	Year 2005 / سنة 2005	Year 2006 / سنة 2006	Year 2007 / سنة 2007	Year 2008 / سنة 2008
Bekaa / البقاع	27.5	22.9	43.7	325.3	0.0
South Lebanon / لبنان الجنوبي	54.4	79.6	86.6	273.6	243.1
Nabatieh** / النبطية**	36.3	60.7	86.6	232.8	207.86
Mount Lebanon* / جبل لبنان*	254.0	155.3	316.6	2372.2	1132.96
North Lebanon / لبنان الشمالي	213.0	121.4	341.1	827.1	227.22
Lebanon*** / لبنان***	**585.3**	**440.0**	**874.6**	**4031.0**	**1860.53**

*** An additional fire which date is unknown and the area is 6.2 ha / هكتار تاريخ 6.2بالإضافة إلى حريق مساحته اندلاعه غير متوفر***

**** An additional fire which date is unknown and the area is 0.7 ha / هكتار تاريخ 0.7بالإضافة إلى حريق مساحته اندلاعه غير متوفر****

***** Three additional fires in May, June and July and which area is repectively 10, 1.6 and 6 ha and which distribution over Mohafazat in unavailable / 10ثلاثة حرائق اندلعت في أشهر أيار وحزيران وتموز مساحتها هكتارات على التوالي توزيعهم على المحافظات غير متوفر 6و 1.6و*****

Total of burnt area is 1860.53 ha in 2008 / 1860.53بذلك تصبح المساحة المحروقة 2008هكتار سنة

Questions we should ask in Lebanon about climatic change

- Climatic change:
  - Does SEEA take into account climatic change because its future impacts are and will be very expensive? In fact climatic change is threatening Lebanon by drought.
  - If not, does SEEA provide some indicators related to climatic change?
  - Do we possess all the required data for climatic change in Lebanon?

Questions we should ask in Lebanon about climatic change (Cont.1)

- In the Vulnerability, Adaptation and Mitigation Scoping Meeting of the « Enabling Activities for the Preparation of Lebanon's Second National Communication to the United Nations Framework Convention on Climate Change » Project and National, Economic, Environment and Development Studies Inception Workshop, American University of Beirut (AUB), on August 18, 2009, and in the water working group, we addressed water data availability that may help in building a partial SEEAW for Lebanon.

Questions we should ask in Lebanon about climatic change (Cont.2)

- The available water and some limited wastewater data in Lebanon are provided by Water and Waste Water Establishments;
- Monthly Meteorological data.
- Forest fires in Lebanon: burnt green area is reduced in Lebanon which may cause a severe shortage in green and blue water in the future and may accelerate the bad effects of climatic change.
- But What about drought statistics and indicators?

Questions we should ask in Lebanon about climatic change (Cont.3)

- The available indices of hydrologic drought are only: volume of precipitation.
- The missing indices of hydrologic drought are:
  - Precipitation intensity: Intensive rainfall peaks;
  - Rivers and stream:
    - Course: Shallow water level, high chlorophyll and pollutants content;
    - Discharge: Decrease in discharges at outlets, low water velocity;
    - Length: decrease in total tributaries length, intermittency in water flow in some courses;

Questions we should ask in Lebanon about climatic change (Cont.4)

- Spring:
  - Discharge: Decrease in discharge, Quality deterioration;
  - Permanency: Total disappearance of some springs, discharge intermittency;
- Lake and reservoirs:
  - Water level and quality: Lowering in water level, surrounded by mud cracks and sediments, quality deterioration;
- Snow:
  - Areal coverage: Decrease in areal coverage, low geographic distribution, lower snowfall frequency;
  - Thickness and density: Lowering in thickness and in density;

Questions we should ask in Lebanon about climatic change (Cont.5)

- Groundwater:
  - Pumping: Decrease in yield from wells, flow intermittency, quality deterioration;
  - Water table: High depletion in water level;
  - Water quality: Saltwater intrusion;
  - Submarine springs;
- Soil moisture:
  - Water content: Decrease of water content below normal level.

(Shaban, A. (2009), Indicators and Aspects of Hydrological Drought in Lebanon, Water Resources Management (2009), 23:1875-1891)

THANKS