

### Meso studies help to answer questions such as

- What are the economic benefits for a given sector to act in favour of the environment?
- What is the part of the cement sector in the national degradation of the environment?
- What would happen if the price of water or fuel increased?
- What economic incentives should be put in place?

### Abstract

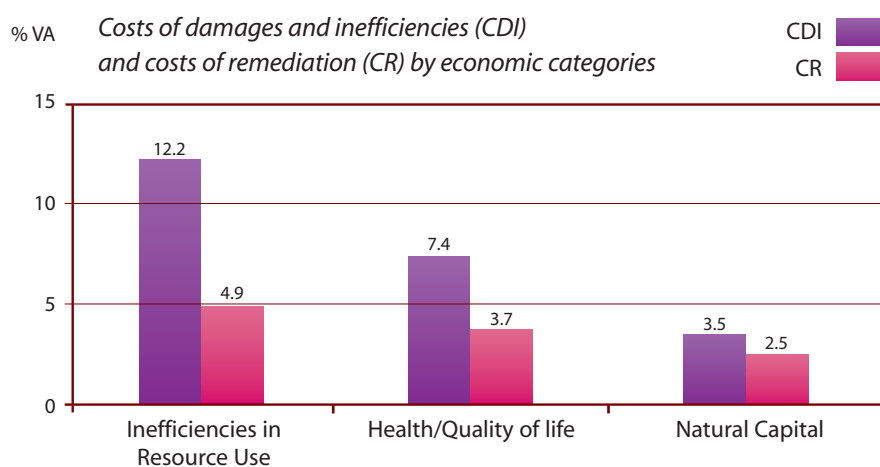
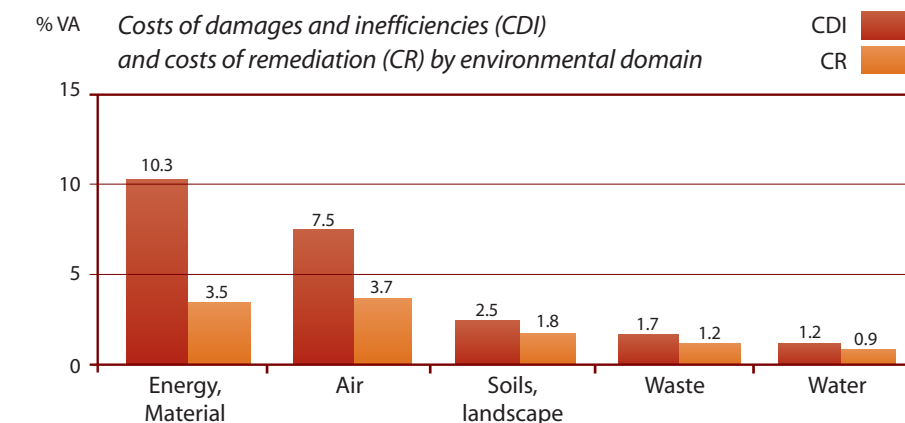
Producing cement is an industrial activity that inevitably puts strain on the environment. The environmental degradation due to the activities of the Syrian cement sector was equivalent to 32.5 million USD in 2002 (23.1% of the value added (VA) of the cement sector). According to the meso profile of the Syrian cement industry, reducing the environmental impact of the sector would definitely be advantageous both environmentally and economically. The meso profile of the Syrian cement sector shows that repairing the environmental damages of the sector amounts to half the costs of those damages. As a matter of fact, the costs of inefficiencies, mainly due to the inadequate management of raw materials (water, fuel, limestone, basalt, gypsum, etc.) amount to 12.2% of the VA and the costs of environmental damages to 10.9%. In addition, costs related to the emission of CO<sub>2</sub> were estimated at 8.2% of the sector's VA.

### Positioning

By comparing the sector to the national context, the contribution of the Syrian cement sector to the national value added in 2002 (GDP) is less than 1% whilst its contribution to environmental damages is more than 1% (excluding inefficiencies).

### Main Results

A closer analysis of the meso profile of the Syrian cement sector highlights the burden of the extractive and burning activities on the natural and social environment. Three environmental domains (water, waste, energy/materials) contribute to the economic category 'Inefficiencies in resource use' and the share of 'Energy and Materials' amounts to 85%. Interestingly enough, it is the domain that presents also the highest potential for savings. Indeed, it is usually a joint matter of installing a rigorous and adaptable system of manage-



ment of resources and adjusting a more efficient production process which will prevent the wastage of raw materials.

The other salient domain is Air. It contributes entirely to the economic category 'Health and quality of life'. Dust emanating from cement plants in Syria constitute the main air pollutant indoors and outdoors and contributes to respiratory diseases that affect both employees and neighbouring communities.

Syria inherited second-hand factories, thus the machinery is out of date and normative standards are often exceeded (e.g. noise, air emissions). Technologies, such as electro-filters or bag filters, can be installed but their application is sometimes difficult and the efficiency is pretty low (for example causing stoppages). The impact of stoppages were estimated at 2.8% of the VA which is quite consequent.



# Environment-economic indicators

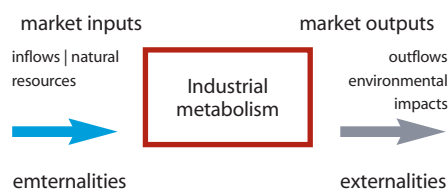
## Cement sector, Syria

### What is meso

A meso study is the economic assessment of the environmental degradation at the level of an economic sector or an urban community. It focuses on connecting micro (unit) and macro (country) evaluations on a middle (sector) - meso - level. The objective of meso studies is to seize and measure the importance of material flows and transformations of the industrial or urban metabolism and translate them into economic monetary terms, into environmental degradation costs (costs of damages and inefficiencies) and remediation costs. Then, these costs are related to the value added (VA) of the studied body.

### An innovative methodology

The assessment of environmental degradation requires a lot of data collection (in individual companies) and different stages of analysis. The entity studied is seen as a **'living body'**, that is to say, through its activities, the entity ingests, transforms resources, produces goods, and generates discharges, thus putting pressure on ecosystems (industrial metabolism). This prospect sets the limits of the system studied.



The data collection takes place at the entry of the production process (input) and at its exit (output). The data are then analysed in detail listing precisely all materials entering the process (water, limestone, sand, energy, etc.) and exiting the process (finished product, water, CO<sub>2</sub>, SO<sub>2</sub>, waste, etc.) as well as general economic and human resources data. Along with national economic records, the economic calculation of the environmental degradation of the sector is therefore possible. The results are then allocated to six **environmental domains** (water, air, soil and landscape, wastes, energy/materials, global environment) and three main **economic categories** (health/quality of life, natural capital, inefficiencies in the use of resources).

#### COSTS OF DAMAGES (CD)

*Costs of environmental damages are a loss of well-being, from an economic point of view, for a community or a country. It could be the consequence of health impairment, loss of revenue, or loss of environmental services.*

#### COSTS OF INEFFICIENCIES (CI)

*Costs of inefficiencies are the economic consequences of mismanaged use of natural resources, e.g. loss of water through leakage or wastage of energy.*

#### COSTS OF REMEDIATION (CR)

*Costs of remediation are expenses incurred to protect the environment, either by preventing or repairing its degradation (e.g. new filters, new sewage treatment unit, awareness session, etc.).*

### Reference study

Pillet, G., Zein, K., Carrara, A., Benyahia, N. (2004). *Meso-economic study of the environmental costs and benefits of the cement industry in Syria. Results and methodology guide.*

### Study undertaken by

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