The evaluation of air quality at an industrial coast – PT

1. Policy Objective & Theme

- SUSTAINABLE ECONOMIC GROWTH: Balancing economic, social, cultural development whilst enhancing environment

2. Key Approaches

- Integration
- Participation
- Knowledge-based
- Technical

3. Experiences that can be exchanged

A multi-disciplinary tool to manage air pollution and the impact of social pressures on an industrial area of the Portuguese south coast was developed and implemented.

4. Overview of the case

The case shows the way that private companies, local authorities and research institutes can work together to monitor air quality and reduce emissions. Multi-disciplinary methodologies were implemented including the use of lichens as bio-monitors.

5. Context and Objectives

a) Context

During the nineteen-sixties, the Sines region in south Portugal became a centre for industrial development, linked to an important industrial harbour with several industries responsible for air polluting emissions. At present, the industrial units are spatially clustered, very close to densely populated areas and to areas of conservational interest. Awareness for this environmental problem is increasing, at the industries themselves as well as at different levels of administration and local populations. Gaseous emissions from the different industrial units are very similar, making the identification of each source's contribution very difficult, though nonetheless imperative.

The work was conducted as a response to a local demand for an improvement in air quality and the opportunity presented by the surrounding parks and coastal areas for eco-tourism. It recognised the urgent need for a monitoring tool that would take various types of data, such as emissions, traditional air-quality indicators, bio-indicators and information about land-use and climate, and provide the local authority with useful guidelines for sustainable development and land use.

b) Objectives

The main objective was to enable the Commission for Regional Coordination and Development of the Alentejo region (CCDR-Alentejo) to better evaluate the air quality of the Sines region and to characterise the different impacts of air pollution on the local populations.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

The initiative was lead by the Commission for Regional Coordination and Development of the Alentejo (CCDR-Alentejo) which was, at that time, responsible for coastal management of this area. The ARH-Alentejo is now responsible for keeping the system up and running, and monitoring facilities are a permanent fixture of the area.

b) ICZM tools

The programme systematically and sequentially validated a set of bio-indicators and bio-monitors for the assessment of the air quality in Sines. It used mathematical and geo-statistical models to evaluate the space-time dispersion of the main pollutants and to assess risk and impact cost maps. It evaluated the social impacts of local industrial pollution considering risk perception on pollution issues and further integrated different methodologies and procedures in a global tool for monitoring, planning and management of air quality in an information system as a common platform.

The main outcomes were; an air quality monitoring network which couples bio-monitoring and monitoring through physical devices and is permanently implemented in the region to measure the main pollutants; an Information System, which includes a database and a GIS, installed in the local agency's computer system; geo-statistical and mathematical models for air quality assessment implemented in a GIS and database platform; a description of sociological tools to collect, compile and treat data regarding the social impacts of air quality; trained people to handle the monitoring network and to do the routine work with the models, GIS and database; and the availability of the system, allowing distinct outputs for coastal managers, industry and the general public, on a web platform.

7. Cost and resources

The total budget for the work was €1,282,000 of which €622,000 was contributed by the LIFE programme.

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

The initiative demonstrated that a multi-disciplinary approach is the most appropriate for planning and management of air quality and to evaluate its social impacts, aiming at a sustainable development and land-use planning.

9. Success and Fail factors

Organisers attribute a good deal of the success of the project to the involvement of private companies, public bodies and research institutes working together. The project was supported by the Instituto Superior Tecnico (the largest Portuguese engineering faculty), the Lisbon University Foundation, and the ISCTE (Higher Institute of Business and Labour Sciences) as well as the main companies in the area, Petrogal, Borealis, CPPE, Tránsgas, Atlântico e administração do Porto de Sines. Another key to the project's success was its multi-disciplinary approach. Lichens that can accumulate several pollutants were used as bio-monitors, social problems were monitored and geo-statistical models of pollutant dispersion were developed. This approach resulted in reliable and detailed monitoring and management of air quality.

10. Unforeseen outcomes

The project has a positive legacy: trained personnel continue the monitoring work, and an active website and ongoing newspaper slot are part of the project's aim to address public concerns and include the local population in sustainable land use.

11. Prepared by

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12. Verified by

It has not been possible to verify this case.

13. Sources

- An interdisciplinary project for air quality characterisation in the Sines region (Portugal) (undated) Life-Env/P/000830
- www.ccdr-a.gov.pt/sinesbioar

SINESBIOAR Laymans report (2.23 MB)