Environmental auditing: the case of Ecuadorian industry

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ABSTRACT

As part of the Programme of Competitiveness, the Ecuadorian Chamber of Industry included the Competitiveness and Environment Project, with the objective of assessing the environmental issues of industrial activity and recommending policies and action plans for improving its management and performance. An auditing process was performed, focusing on three basic aspects:

- knowledge of, and conformance with, environmental regulations;
- environmental impacts definition; and
- environmental management.

During March and April of 1998, fifteen cases were studied in the three most industrialized cities of Ecuador: Quito, Guayaquil, and Cuenca. These industries, which adhered voluntarily to the project, are of different sizes and dedicated to a variety of production fields. The results show a high heterogeneity in the magnitude and intensity of their environmental impacts; however, the most critical aspect was related to wastewater discharges, where most prevention or control action has been taken. Additionally, it can be determined that environmental management is still a practice not adopted by the industrial sector in Ecuador.

INTRODUCTION

In January of 1998, the Ecuadorian Ministry of International Trade delegated to the National Federation of Industry's Chambers the responsibility for developing a programme designed to formulate a strategy for competitiveness within Ecuadorian industry as well as in the framework of global economy and the open market. One of the components of the programme was the Competitiveness and Environment Project, to identifying current conditions and opportunities for implementing

See Topic11

UNEP EIA Training Resource Manual

Implementation and follow up

environmental management practices within Ecuadorian industry. This Project had the financial support of the Embassy of the Netherlands and was developed between February and May of 1998. An independent multidisciplinary team was formed to perform the tasks involved in the Project.

This report summarizes the main findings of the Project, as well as the background context, the procedures and approaches taken, and the perspectives derived from this experience.

NATURE AND SCOPE OF ISSUES

Environmental degradation due to industrial pollution has been recognized as one of the main problems presently confronting Ecuador. In fact, national and local governments have been trying to create new alternatives for introducing environmental responsibility in the industrial sector, without compromising its growth.

At present there are environmental laws and regulations for controlling industrial air emissions, water discharges, toxic solid waste generation and disposal, and noise levels for new and existing facilities, and also mandatory environmental impact assessment studies prior to new developments. However, despite the fact that those legal requirements have been in place for at least ten years, results are very poor and only quite a small group of enterprises have implemented environmental protection practices in their operations.

There are many different causes for this state of affairs. These can be summarized as:

- Inadequacy of the legal framework, since this basically is a transposition of other countries' laws.
- Political and technical weakness of national and local agencies in enforcing environmental regulations.
- Few developments or little experience in environmental engineering, especially in the field of industrial pollution control.
- Lack of sensibility of the industrial sector to environmental issues.
- Limited knowledge in the industrial sector about modern environmental management tools, such as pollution prevention techniques and environmental management systems.

On the other hand, these last ten years have seen the growth of public awareness about environmental degradation, which has meant an increase in the pressure from ecological and citizens' organizations for more stringent

control by authorities of pollutant activities, especially in the most industrialized cities.

As a response to that new movement, the Ecuadorian industrial sector has developed a strategic plan with the objective of promoting clean production and environmental consciousness among its members and the whole society. Additionally, government agencies, the scientific community, NGOs, and the industrial sector itself are interested in both reforming current environmental laws for incorporating more realistic performance standards on the basis of local conditions, and implementing modern tools of environmental management in industry, including economic incentives and managerial practices. Unfortunately, the outlook does not seem optimistic, as other more critical factors have forced environmental concerns to take second place to emphasis on economic survival.

PROCESS AND PROCEDURAL CONTEXT

The focus of the Competitiveness and Environment Project was an environmental audit of a number of industries, with the purpose of determining the level of implementation of environmental management practices and the most important environmental impacts derived from their activities. The established process was as follows:

Selection of participant industries

Representatives of the industrial sector and the Director of the Programme selected fifteen industries which had responded to an open invitation formulated by the Programme. That participation was voluntary and a confidentiality agreement was signed between the industries and the consultants. These industries are located in the Quito, Guayaquil, and Cuenca influence areas and are of different sizes and activities (meat products, food processing, wood products, pulp and paper, plastic products, dyes and paints fabrication, clay products, metallic products, flower and rice plantations, and animal food production). The selection criteria took into account the need to have diversity among participants and the willingness of industries to allow and facilitate auditing.

Formation of auditing team

A multidisciplinary team of economists and environmental engineers, with experience in environmental impact assessment was assembled. Additionally, laboratories were selected for sampling analysis of air emissions and water discharges.

Definition of an auditing procedure

Due to the objectives of the Programme, three basic aspects were established as targets to be evaluated:

- environmental regulations knowledge and conformance;

- environmental impacts; and,
- environmental management practices.

The team defined the auditing protocols for the initial interview, site inspection, and sampling of air emissions and wastewater effluents.

Performing the environmental audits

Audits were performed in March and April of 1998. They were undertaken with a manager from each of the selected firms. Audits consisted of an initial interview to explain the scope of the exercise and collect background environmental information, a site inspection of the facility, and a sampling activity of air emissions and wastewater effluents and measurement of noise levels, where appropriate. The interview and inspection were performed the same day. Sampling was done according to plant operation schedules.

Individual reports preparation

Audits were reported in individual files addressed to the top management of the participant organizations. Those reports contained not only the results and findings of the audit, according to the established protocols, but also some recommendations for improving environmental management and control practices in that industry.

General report preparation

The audit team also prepared a final report where general conclusions and recommendations are summarized. The structure of that report was according to the targets mentioned above and also describes the procedures and methodologies used in the Project.

Workshops for discussion of the reports

As a final part of the Project, three workshops, one in each city, were organized to discuss the general results. Besides industrial representatives, there were invited members of the national (Ministry of Environment and National Agency of Planning) and local governments (Municipalities of Quito, Guayaquil, and Cuenca), financial institutions (National Financial Corporation), and NGOs related to the project activities. The lectures at the workshops are published and available to the public.

APPROACHES TAKEN

Environmental regulations, knowledge and conformance

During interviews, the auditing team evaluated knowledge of both the existence and the most important requirements included in national, local, and special environmental regulations related to specific activities (i.e. pesticides use or hazardous materials handling). A grade scale was defined

as follows: (A) complete knowledge; (B) partial knowledge; and (C) poor knowledge.

For grading the level of conformity, proof such as independent characterization analysis and/or official certifications was required. The categories used were: (A) conforming with most of the requirements; (B) conforming with some requirements; and (C) no conformance at all.

Environmental impacts

A cause-effect matrix was used for assessing environmental impacts, in order to identify which activities have the most critical effects on the environment, and also, the elements of the environment most affected by those activities. The basis for this determination was the results of laboratory analysis and in situ measurements which were contrasted with the limits and other requirements established in current national laws.

Since the audited facilities were located in urban areas, biotic elements of the environment were not considered. Rather, physical environment (water, air, and soil quality), as well as workers safety and community disturbances, was the main focus of the assessment.

Interactions were identified and graded in a numerical scale with a maximum of 100 points for the most critical impact. That numerical value was an aggregate of several parameters: intensity, extension, occurrence, persistence, reversibility, synergy, accumulative effects, relationship cause-effect, periodicity, and mitigation. Each of those parameters had its own categories with specific numerical scales.

After this exercise, impacts were grouped in three categories: (A) low impact (from 0 to 33 points); (B) medium impact (from 34 to 66); and (C) high impact (from 67 to 100).

Environmental management practices

A set of 15 aspects was evaluated in order to determine the level of integration of environmental management practices inside the participant organizations. Those aspects are related to the requirements of the ISO 14001 standard for environmental management systems, although they are not strictly the same. The aspects evaluated were:

- priority of environmental issues for the organization;
- integration of environmental practices into general practices of the organization;
- willingness to improve its environmental management;
- definition of an environmental policy;
- awareness of environmental impacts derived from its activities;
- definition of environmental objectives and goals;

- definition of an organizational structure and responsibilities associated with an environmental management programme;
- training programmes on environmental issues;
- consumers advice about products and services;
- definition of environmental requirements for subcontractors and suppliers;
- information to neighbourhood communities about environmental impacts and risks associated with its activities;
- implementations of process changes (pollution prevention or control measures) due to improve environmental performance;
- emergency preparedness;
- monitoring programmes and protocols; and
- Environmental documentation and records control.

Each aspect was graded from 1 (no action taken, poor condition, etc.) to 5 (actions has been evaluated and maintained desired condition, etc.). A final aggregate figure, in percentage, was assigned for every industry.

RESULTS AND IMPLICATIONS

The most important results obtained from the Project are briefly presented below:

- There is partial knowledge about environmental law among participant industries. Most of them know of the existence of national and local regulations, but very few were aware of the contents or the requirements that those regulations imply. Besides, the understanding of the scope and purpose of those requirements was still confusing for the industrial sector.

- Most of the studied cases may be categorized in the B group, that is, conformance with some requirements. There were, however, a couple of industries with a very good environmental performance. In general, much more attention has been paid to wastewater discharges than to air emissions or other sources of pollution.

- Due to the size of the audited organizations, most of the environmental impacts were identified as low or medium. In order of importance, the main problems detected by the auditing were: discharges of untreated wastewater effluents, excessive levels of noise inside the facilities, lack of training about handling of hazardous materials, uncontrolled air emissions, and solid waste generation and disposal.

- Environmental management practices are still uncommon inside

participant industries. Most of the evaluated aspects were graded with 1 or 2, which indicates that some action has been taken in response to environmental issues. In the cases of Quito and Cuenca, where the local governments have had a more active role in environmental control, with more adequate local regulations, the average grading of the industries was higher than in Guayaquil which was characterized by a weak control. Finally, it is important to point out that all of the organizations showed a willingness to improve their environmental management practices.

LESSONS LEARNED

This project constituted one of the few in our country related to environmental management in the industrial sector and the results show the necessity of new efforts oriented to promote good practices in pollution prevention inside the Ecuadorian industry. In that perspective, it would be important to consider the following conclusions:

- The mere fact of having a law does not imply a better level of environmental performance. It is necessary to promote that regulation among involved parties, discuss its scope and purpose, and, in the main strengthen agencies in charge of its enforcement.

- There is a serious lack of information in the industrial sector about modern tools for environmental management, and this is one of the main causes for poor environmental performance. Therefore, to create a new environmental consciousness, based on an integrated management of the environmental issues, seems to be a priority for that sector.

LIST OF RELEVANT PUBLISHED PAPERS AND OTHER SOURCE MATERIAL

González J. C. editor (1998). *Gestión Ambiental en la Industria. Sistematización de talleres.* Federación Nacional de Cámaras de Industrias (National Federation of Industry's Chambers). Quito, Ecuador.

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Key words

environmental audit

impact management