EIA procedure

A new method to determine the level of the environmental impact assessment studies in Mexico

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Abstract

Based solely on the personal criteria and experience of the staff, the environmental authorities in Mexico decide if any proposed productive project requires an environmental impact study. If the staff requires one, it can be assigned at three different levels: general, intermediate, and specific. The differences in time and cost to develop each level of study are large. There is no quantitative tool in Mexico to support, with objective criteria, the decisions of the environmental authority staff. Therefore, final decision is subjected to multiple pressures and interpretations. We propose a new quantitative method to support, objectively, the decision of the environmental authorities. The method is based on ecological criteria with a quantitative scale, and it is directed toward harbor and port projects. Supported by this method, the environmental authorities in Mexico can accurately determine if a new project requires an environmental impact study. If the project requires one, the method determines the level required. This method can be easily adapted to any other productive activity, and to any other country. © 2001 Elsevier Science Inc. All rights reserved.

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1. Introduction

According to the general law of ecological equilibrium and protection of the environment (Anonymous, 1989a,b), all new productive project proposals must be analyzed for their effects on the surrounding environment. The promoters of the project must provide the Mexican Ecology Ministry (SEMARNAP, in Spanish) an initial environmental report, which includes a general description of the main environmental features surrounding the site of the proposed project (Anonymous, 1989c), and a brief description of the activities proposed to be developed by the project (Anonymous, 1989c).

Based on this report, the staff of SEMARNAP decides if the promoters must develop an Environmental Impact Assessment Study (EIAS). If it is not necessary, the promoter receives automatic approval to develop the project. If the staff of SEMARNAP determines that an EIAS is necessary, then they also decide which level is required. There are three EIAS levels in Mexico: general, intermediate, and specific (Anonymous, 1989d,e,f). Each EIAS level consists of a full description of the physical, biological, and socioeconomic characteristics of the site where the project is to be developed, a full description of the proposed project activities, and an assessment of the interactions, negative and positive, among the proposed activities and the environment.

The EIAS are financed by the promoters of the project. There are large differences in the level of the studies required to fulfill the requirements of each EIAS level (Ortega-Rubio et al., 1990a,c, 1994). From our experience, a general-level EIAS (Ortega-Rubio et al., 1990a,b, 1992, 1993, 1995, 1996) can be developed in 2 to 4 months by a team of 5 to 10 specialists. An intermediate-level EIAS (Ortega-Rubio et al., 1994) can be successfully developed by a team of 15 to 25 specialists in from 3 to 8 months. To develop a specific EIAS, a team of 30 to 60 specialists working full time from 9 to 18 months is required (Ortega-Rubio et al., 1990c).

Despite such huge differences in the time, effort, and money required to develop each level of an EIAS, in Mexico the determination of the required level is based solely on the criteria and experience of the staff reviewing the environmental preventive reports. At the Environmental Ministry of Mexico (SEMARNAP), the turnover rate of the staff is large. The Ministry usually depends on the recruitment of recent college graduates. The probabilities that the same staff reviews the same kind of projects over 6 years are practically zero.

Also in our experience, the staff of SEMARNAP (Ortega-Rubio et al., 1994) is subject to political and economic pressures that can generate unpredictable and random decisions regarding the level of EIAS required (Ortega-Rubio et al., 1994).

Because of all these reasons, we propose a new method based on a quantitative weighing of ecological and project characteristic criteria, which will allow a

rational determination of the level of EIAS required for proposed projects for harbors and ports. Our quantitative proposal is mainly based on our experience in the development of this kind of EIAS (Ortega-Rubio et al., 1990a, 1992, 1994, 1995, 1996).

2. Materials and methods

From January to December 1997, we reviewed 47 EIASs developed in Mexico for the construction and operation of harbors and ports. We carefully reviewed all the rules and criteria used to analyze, in Mexico, such projects (Anonymous, 1989b,c,d,e,f). During 1997, we requested the environmental authorities of eight different countries to provide their criteria, according to the legislation of each country, used to assess the environmental effects of the construction and operation of harbors and ports. Only four countries provided us this information: United States of America (Anonymous 1992a; Snedaker and Getter, 1995), Japan (Anonymous, 1989g), Canada (Beanlands and Duinker, 1983; MacDonald et al., 1992), and Spain (Anonymous, 1992b,c).

3. Results

After the analysis of all the information, particularly that of outstanding harbor and port projects, from the environmental protection point of view and based on our experience we developed the following proposal. It includes 10 quantitative criteria, whose summary can help define if a proposed project requires an EIAS, and if it does so, what the level must be.

The information to quantify these criteria must be supplied by the promoter of the project as a part of the initial environmental report. Each criterion is quantified according to the following scales.

3.1. Criterion 1: type of boats to be anchored in the harbor

The boats are classified according to the draft of the vessel.

(a) Boats up to 1 m draft (0.00)
(b) Boats with draft between 1.1 and 3 m (0.50)
(c) Boats with draft between 3.1 and 8 m (1.00)
(d) Boats with draft bigger than 8 m (2.00)

Criterion 1 recognizes the potential environmental problems caused by the dredging. For boats with deeper draft, more dredging will be needed, so the risks of the benthonic communities and the coastal zones (the disposal of dredged material) increase.
3.2. Criterion 2: number of boats to be anchored in the harbor

The project is quantified according to the number of boats to be sheltered at the same time in the harbor.

(a) For less than 20 boats (0.00)
(b) Between 20 and 49 boats (0.50)
(c) Between 50 and 99 boats (1.00)
(d) Between 100 and 150 boats (1.50)
(e) More than 150 boats (2.00)

Criterion 2 assesses the potential impact produced by the simultaneous operation and maintenance of the boats, including washing, painting, waste disposal, fumigation, and fueling.

3.3. Criterion 3: loading risks

This criterion assesses the risk of environmental impact caused by the loading and unloading of substances cataloged as dangerous according to Mexican legislation.

(a) With management of hazardous materials (3.0)
(b) Without management of hazardous materials (0.0)

3.4. Criterion 4: number of passengers boarding

The project is assessed as a function of the daily average of passenger usage of the harbor during the first 5 years of operation.

(a) Less than 50 daily passengers (0.10)
(b) Between 51 and 250 daily passengers (0.50)
(c) Between 251 and 750 daily passengers (1.00)
(d) More than 751 daily passengers (2.00)

Criterion number 4 recognizes the potential impacts produced by the people using the facilities to satisfy their requirements for water, food, electrical energy, and waste disposal, and the necessity to build the infrastructure and hire the people to manage these facilities.

3.5. Criterion 5: number of similar facilities operating in the area

The effects on the environment produced by similar projects operating in the same region can be additive and synergistic. The number and quality of similar
3.9. Criterion 9: construction requirements

The following additive qualifications recognize many negative impacts are produced during construction.

(a) Project includes dredging (1.0)
(b) Project includes land fill of the coast (1.0)
(c) Project includes solid structures affecting movements of the current, such as breakwaters (2.0)
(d) Project includes the building of an access road longer than 3 km (1.0)
(e) Project includes the use of more than 1 ha of coastal zone (1.0)
(f) Project includes a channel for connection to the open sea (2.0)

3.10. Criterion 10: number of workers

During construction, the temporary workers, usually coming from other regions, could potentially affect the environmental features of surroundings of the proposed project.

(a) Less than 10 workers (0.10)
(b) Between 11 and 50 workers (0.50)
(c) Between 51 and 100 workers (1.00)
(d) More than 101 workers (1.50)

3.11. Total summary EIAS level

The procedure to assess any proposed project is simple. The person assessing the initial environmental report need only sum the totals of each preceding criterion, and determine the EIAS level from the following:

(a) Less than 1.0. This project does not require EIAS.
(b) Between 1.1 and 3.0. This project requires a general EIAS.
(c) Between 3.1 and 6.0. This project requires an intermediate EIAS.
(d) More than 6.1. This project requires a specific EIAS.

4. Practical examples

During 1992, we wrote a general EIAS for the project “Tourist Dock at Cabo San Lucas” (Ortega-Rubio et al., 1992). This project, proposed by local fishermen, included the construction of a small dock for five boats (0.0 in our scale); boats with less than 1 m draft (0.0); and outside any protected area (0.0). For its construction, there will be less than 10 workers (0.10). The zone is more than 3 km from any recreational beach with primary contact (0.0). The proposed project:
projects in the same region are assessed. Similar operating projects are quantified using the same scales proposed in this work.

(a) Region with 1 to 3 similar facilities. Facilities whose criteria summary is less than 5.0 (0.3)
(b) Region with 4 to 10 similar facilities. Facilities whose criteria summary is less than 5.0 (0.7)
(c) Region with more than 10 similar facilities. Facilities whose criteria summary is less than 5.0 (1.00)
(d) Region with at least one similar facility whose criteria summary is more than 5.0 (1.00)

3.6. Criterion 6: proximity to a natural protected area

This criterion recognizes the sensitivity of the environmental characteristics that protect a natural protected area.

(a) Inside a natural protected area (3.5)
(b) Less than 30 km from a natural protected area boundary (1.5)
(c) Farther than 30 km from a natural protected area boundary (0.0)

3.7. Criterion 7: biological importance

Because not all the biologically important zones in Mexico are officially decreed as natural protected areas, this criterion recognizes the biological uniqueness of the area where the project is proposed. Because both qualifications may apply, the results are additive.

(a) Zone with high biological diversity, including coral reefs, mangroves, and marshes (2.0)
(b) Zone with high percentage (20%) of endemic species (3.0)

3.8. Criterion 8: present land use

This criterion assesses the current activities present in the area where the project is proposed.

(a) Less than 3 km from a recreational beach with primary contact (3.0)
(b) Inside a tourist zone with less than 100 hotel rooms (0.5)
(c) Inside a tourist zone with more than 100 hotel rooms (0.1)
(d) Inside an industrial zone with less than three industries (0.5)
(e) Inside an industrial zone with more than three industries (0.1)
According to the characteristics of this proposed project, its sum on our scale is 0.20. This particular project did not require any EIAS; however, because an international hotel (wishing to develop its own dock in the same area) caused enough pressure on the authorities, these local fisherman were compelled to pay for the EIAS.

There is also the reverse situation. Wealthy people and corporations put economic pressure on the authorities to avoid EIAS or obtain the lowest level possible; however, with the use of our proposed scale, the determination of whether an EIAS is needed or not is more objective. For example, a project is proposed:

- to develop a harbor for 50 yachts (1.00);
- with a draft between 1 and 3 m (0.50);
- using 50 workers during the construction phase (0.50);
- dredging the coast (1.00);
- putting in land fill (1.00);
- using more than 1 ha of coastal zone (1.00); and
- building an access road shorter than 3 km (0.00).

Such a project must develop an EIAS because the sum for this proposed project is 5.00. Independent of the pressures that could be exerted on the staff of SEMARNAP, if the environmental effects of this proposed project are objectively assessed, an Intermediate EIAS is required. Independent of the economic or political pressure on the authorities, the staff must ask for an Intermediate EIAS, because there is a quantitative scale that supports this decision.

5. Discussion

In a country as diverse as Mexico, it is difficult to propose a general method to assess the required level of EIAS for a proposed harbor and port project; however, our proposal has been carefully considered and tested. Each proposed criterion scale was carefully weighed. Our proposal could be improved because we believe use will help define qualifications in the light of actual use. If our proposal is used by the environmental authorities, it will yield the following advantages:

1. The criteria to assess an initial environmental report will be exactly the same over all of Mexico;
2. Based on a quantitative scale, the staff of the environmental authorities could temper any pressure by the promoters of any project;
3. Any large and potentially negative project will not be approved without the adequate EIAs; and
4. Any small and environmentally friendly project will not need to develop an exhaustive EIA.

Independent of future improvements, our proposal's main virtue is that it is the first attempt to establish quantitative criteria in a sensitive and strategic viewpoint for any country — the assessment of the level of EIAs required for productive activities. Based on this proposal, we hope that in the future we can see similar proposals for all the other main economic activities of our country, and, maybe, of other countries.

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