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Analytical methodology for the analysis of alternatives in Strategic Environmental Assessments and their uncertainties in the decision-making process

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Strategic Environmental Assessments (SEA) have evolved in the past 25 years in the context of their application to Policies, Plans and Programs (PPPs). During this time various theories have been proposed. However, there is still a lack of analytical methodologies that allow for a concrete application of the SEA. This lack of tools lead to knowing the impacts beyond the object of the evaluation has been evidenced.

One of the areas that needs to be studied and discussed in more detail is the analysis of alternatives, since there is a gap both in analytical techniques and in the analysis of results that indicate the uncertainty of the alternative under analysis.

Three basic phases are recognized for the analysis of the alternatives: a) identification and development, b) evaluation and comparison and c) selection of the alternative and its documentation. Scientific literature identifies the main evaluation approaches: matrices, multi-criteria evaluations, expert judgment, modeling and sensitivity analysis under geographic information system (GIS) mechanisms. This marginal area of the SEA requires not only the application of methods that clearly explain the processes followed but also the participation of those involved. This would allow providing the decision-making process - third phase of the analysis - with enough accuracy, as required by one of the main objectives of the SEA.

Besides, during the development of each of the phases, information must be generated that guarantees that the alternative selected is that of minimum uncertainty. The analysis of uncertainty in the SEA allows for the validation and control of risk in the decision-making process. This is considered to be one of the most significant challenges in the application of a SEA, since at the current stage the selection of alternatives is made considering the one that is more "reasonable", although the term is not explained in the literature in a concrete way and consequently increasing the subjectivity to this marginal area of the SEA.

This research proposal is focused in developing a methodology that allows for performing the analysis of alternatives, incorporating the validation of the selection of the optimal alternative through an uncertainty analysis. The final selection will be validated comparing with existing strategic environmental assessments, by making the comparison between these already existing approaches and the proposed methodology.