

Dr. Dharam Singh

Fundamental Principles of EIA: One of the key values of EIA is the chance it gives proponents and decision makers to design and implement an action with the best available knowledge of its impacts and likely performance. The capacity for EIA to provide such information depends largely on the principles and values that inform and guide it both as a system and as part of the policy process. Barry Sadler's (1996) work on evaluating practice and performance in EIA provides a key discussion of the principles and core values of impact assessment, or at least what they should be. Sadler (1996) writes of EIA as having five main guiding principles:

1. A strong legislative foundation. EIA should be based on legislation that provides clarity with respect to objectives, purpose, and responsibilities. Application of EIA should be codified, based in law rather than in discretionary guidelines.
2. Suitable procedures. The quality, consistency, and outcomes of EIA should reflect the environmental, political, and social context within which EIA operates, and should demonstrate the ability to respond to divergent issues.
3. Public involvement. Meaningful and effective public involvement must be present. Not only must those affected and interested be consulted, but their concerns should be able to affect the decision. As Healey (1997) notes, the power of public involvement is in whether or not such involvement has the capacity to affect the decision.
4. Orientation towards problem solving and decision making. The context of EIA is inherently practical and applied. Thus, the EIA system should have relevance to issues of importance, it should generate needed information, and it must influence, and be connected to, the settings where conditions of approval are set and decisions are made.

Principles of EIA Best Practice', part of which is a framework for the basic principles that should guide the design, operation, and practice of EIA; these hold that an EIA system should be

- **Purposive**-the process should inform decision making and effect environmental protection and community well-being;
- **Rigorous**-it should apply the best practicable science, employing methodologies and techniques appropriate to the problems under consideration;

- ***Practical***-it should result in information and suggestions that not only assist with problem solving but can also be reasonably implemented by proponents;
- ***Relevant***-it should provide sufficient, reliable, and usable information for planning and decision making;
- ***cost-effective***-it should achieve the objectives of EIA within the limits of available information, time, resources, and assessment techniques;
- ***Efficient***-it should impose the minimum cost burdens in terms of time and finance on proponents and participants consistent with meeting the requirements and objectives of EIA;
- ***Focused***-it should concentrate on significant environmental effects and key issues, that is, those that need to be taken into account in making decisions;
- ***Adaptive***-it should be adjusted to the realities, issues, and circumstances of the proposals under review without compromising the integrity of the process, and be iterative, incorporating lessons learned throughout a project's life cycle;
- ***Participative***-it should provide appropriate opportunities to inform and involve the interested and affected publics, and their inputs and concerns should be addressed explicitly in the documentation and decision making;
- ***Interdisciplinary***-it should ensure that the appropriate techniques and experts in the relevant biophysical and socio-economic disciplines are employed and integrated, including traditional knowledge;
- ***Credible***-it should be carried out with professionalism, rigour, fairness, objectivity, impartiality, and balance, and be subject to independent checks and verification;
- ***Integrated***-it should address the interrelationships of social, economic, and biophysical aspects;
- ***Transparent***-it should have clear, easily understood requirements for EIA content, ensure public access to information, identify the factors that are to be taken into account in decision making, and acknowledge limitations and difficulties; and
- ***Systematic***-it should result in full consideration of all relevant information on the affected environment, of proposed alternatives and their impacts, and of the measures necessary to monitor and investigate residual effects.

Impact Prediction: Impact prediction is a way of mapping the environmental consequences of the significant-aspects of the project and its alternatives. Environmental Impact can never be predicted with absolute certainty and this is all the more reason to consider all possible facts and take all possible precautions for reducing the degree of un-certainty.

Noise Pollution: Noise is a prominent feature of the environment including noise from transport, aircrafts, industry and neighbors. Transport noise is an increasingly prominent feature of the urban environment making noise pollution important environmental public health issue .Noise pollution in urban cities is steadily increasing over the years. This has direct and indirect impact to the people that can lead to the health hazard. Some of the major health hazards causes by the noise are permanent hearing loss and psychological disorder. Other health problem may be high blood pressure, muscle tension, headache, migraine, irritability insomnia.

Prediction and Assessment of Impacts of Noise on the Environment: Many residential or industrial areas require noise impact assessment reports for project in planning phase. It ensures the adequate protection is provided for upcoming residents by reducing noise impact. Noise impact assessment planning also reduces other impacts on health and quality of life arising from new developments. To provide a basis for addressing noise-environment impacts, a seven-step or six-activity model is suggested for the planning and conducting impact studies.

Step-1: Identification of noise impacts of proposed project. Impact identification is the process designed to ensure that all potentially significant impact are identify and taken account in the EIA process. A number of ‘tools’ are available to assist in impact identification. The simplest, and most frequently used, are checklists of impacts, although matrices, network diagrams and map overlays are also commonly used. More complex tools, such as mathematical modelling and the use of GIS systems, may also be used in certain circumstances.

Step-2: Preparation of description of existing noise environment conditions: The primary measure for describing noise in an EIS is the day-night average sound level, abbreviated as DNL, and symbolized as L_{dn} . The unit for DNL is the decibel. Average sound level is numerically equal to the value of steady sound level that would convey the same mean-square A-weighted sound pressure level as does the actual time-varying sound in the same time period. Average sound level is also called equivalent continuous sound level or equivalent sound level.

Step-3: Procurement of relevant noise standards and &or guidelines: Noise standards for ambient air quality, automobiles, domestic appliances and construction equipment, generator sets, firecrackers have been notified under Environment (Protection) Act, 1986. Noise standards for motor vehicle have also been notified under Central Motor Vehicle Rules, 1989. Noise exposure limits for work zone area have been prescribed in the Model Rules framed under the Factories Act 1948.

Step-4: Impact prediction: Calculating noise levels is to be preferred instead of measuring noise levels. Modelling has the following major advantages: -

- Modelling is relatively easy. Measurements have to be very extensive. Many observation points are needed to supply a complete picture of the noise effects. Furthermore measuring has to be done over a long period to average weather effects, background sounds and even seasonal effects.
- Modelling is possible even if the noise source is not present at the time, like new infrastructure.
- Several solutions to the noise problem can be calculated (noise barriers, less noisy concrete)

Step-5: Assessment of Impact significance.

Step-6: Identification and incorporation of mitigation measures.

Step-7: Preparation of final environmental impact statement.

Prediction and Assessment of Impacts of air on the Environment: Air is a basic requirement for the survival and development of all lives on Earth. It affects health and influences the development of the economy. Today, due to the development of industrialization, the increase in the number of private cars, and the burning of fossil fuels, air quality is decreasing, with increasingly serious air pollution. There are many pollutants in the atmosphere, such as SO₂, NO₂, CO₂, NO, CO, NO_x, PM_{2.5}, and PM₁₀.

The main steps in the proposed model for EIA study on air environment are :

1. Evaluation and identification of sources and quantity of air pollutant emissions of different phases of the proposed activity like the construction operation and development.
2. Detailed evaluation of the project area for the existing ambient air quality, emission inventory and meteorological data.

3. Examination of appropriate law, regulations, or criteria to be followed for maintaining ambient air quality and (or pollutant emission standards.).
4. Carrying out impact assessment studies adopting mass balances, dispersion calculations, comprehensive mathematical models, and (or qualitative predictions based on case studies and professional judgment.