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# Environmental Impact Assessment

The term 'environmental assessment' describes a technique and a process by which information about the environmental effects of a project is collected, both by the developer and from other sources, and taken into account by the planning authority in forming their judgements on whether the development should go ahead. The EIA definition adopted by the International Association for Impact Assessment (IAIA 2009) is 'the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of proposed development proposals prior to major decisions being taken and commitments made. This process emphasis is now explored further.

**Concept of EIA:** An EIA is a systematic process used to identify, evaluate and mitigate the environmental effects of a proposed project prior to major decisions and commitments being made. It usually adopts a broad definition of 'environment' considering socio-economic as well as environmental health effects as an integral part of the process.

The main objectives of EIAs are to provide information on the environmental consequences for decision-making, and to promote environ- mentally sound and sustainable development through the identification of appropriate alternatives and mitigation measures. The three central elements of an EIA are:

- The establishment of environmental, socio- economic, and public health baseline data for the project site before construction. A prognosis of the 'zero alternative' is given, which is the expected development of the project site without project realization.
- The prediction and evaluation of potential – direct and indirect – environmental, socio-economic, and public health impacts of the proposed project.
- The identification of appropriate alternatives and mitigation measures to avoid, minimize, remediate or compensate for any environ- mental, socio-economic, and public health impacts resulting directly or indirectly from the project.

**Aims of EIA:** The main aim of EIA is to predict the impacts of projects on the environment and advise on the best alternative which has minimum adverse impacts. This means that EIA should

be carried out before a decision is taken on whether to go ahead or not with a project. The EIA should therefore be carried out during the design stage of a project.

The stages of project identification through ^o the appraisal stage are the most crucial ones for EIA. This is the time, when the vigorous pursuit of carrying out the activity should be undertaken. The appraisal stage should not only consist of financial appraisal but the environment must be also taken into account. A project should be carried out because of its soundness also on the environment. The implementation, phase also requires constant monitoring to make sure that any environmental protection measures are adhered to. The above shows that EIA should be an integral part of the project planning and management cycle as its objectives are largely to ensure the success of the project by making it environmentally sound.

**Process of EIA:** EIA is a systematic process that examines the environmental consequences of development actions, in advance. The emphasis, compared with many other mechanisms for environmental protection, is on prevention. The environmental impact assessment (EIA) process is an interdisciplinary and multistep procedure to ensure that environmental considerations are included in decisions regarding projects that may impact the environment. The purpose of the EIA process is to inform decision-makers and the public of the environmental consequences of implementing a proposed project.

**Step 1-Screening of the project:** Screening is the process by which a decision is taken on whether or not an EIA is required for a particular project. It shall ensure that a full EIA is only performed for projects with potentially significant adverse impacts or where impacts are not sufficiently known. Screening thus involves making a preliminary determination of the expected impact of a pro- posed project on the environment and of its relative significance. A certain level of basic in- formation about the proposal and its location is required for this purpose.

- **Category A:** full EIA required Projects likely to have significant adverse environmental impacts that are serious (i.e. irreversible, affect vulnerable ethnic minorities, involve involuntary resettlement, or affect cultural heritage sites), diverse, or unprecedented, or that affect an area broader than the sites of facilities subject to physical works (e.g. dams

and reservoirs, large-scale industrial plants, ports, thermal- and hydropower developments, etc.).

- **Category B**: limited EIA Projects likely to have adverse environmental impacts that are less significant than those of category A, meaning that few if any of the impacts are likely to be irreversible, that they are site-specific, and that mitigation measures can be designed more readily than for category A projects (e.g. small scale aquaculture, renewable energy, rural electrification, water supply or sanitation, etc.). The main objective of a limited EIA is to identify suitable mitigation measures.
- **Category C:** no EIA Projects that are likely to have minimal or no ad- verse environmental impacts.

**Step 2- Scoping of the project:** Scoping is the process of determining the con- tent and extent of the EIA studies. The Terms of Reference (ToR), which are elaborated in the process, provide clear instructions to the project proponent on the information that needs to be submitted to the competent authority for EIA, and the studies to be undertaken to compile that information.

**Step 3- Identification and description of policy and administrative aspects:** EIAs usually take place within the distinctive legislative frameworks established by individual countries and/or international agencies. It is therefore recommendable to gain a deeper in- sight and understanding of any national policies or international agreements that apply in a country or region and that relate to EIA.

For instance, the first two steps of an EIA, screening and scoping, shall determine if a full fledge EIA will be required for a proposed project, and what the scope and contents of the EIA will be. Existing EIA policies or regulations should therefore be consulted as they will likely contain relevant information for resolving these issues. Moreover, any other policy relevant to the desalination project needs to be identified. Major thematic areas that should be considered when searching the national or international le- gal system for relevant laws include:

- conservation of nature;
- biological diversity;
- control and prevention of pollution;
- water resources management;

- land use and regional planning.

**Step 4-Investigation and description of the proposed desalination project:** A technical project description should be pre- pared and included in the EIA report. It should form the basis of the EIA process by providing background information on the project which is required to investigate and analyze all potential impacts.

The project description should cover the different life-cycle stages of construction, commissioning, operation, maintenance and decommissioning of the desalination plant.

**Step 5-Investigation and evaluation of environmental baseline:** This step will entail assembling, evaluating and presenting baseline data of the relevant environmental, socio-economic and public health characteristics of the project area before construction, including any other existing levels of degradation or pollution. A nearby 'reference area' with similar base- line characteristics should be identified and surveyed in addition to the project site. Results from both the potentially affected and non- affected site can then be compared as part of the monitoring process during construction, commissioning and operation of the project. The main purpose of a reference site is to distinguish between changes caused by the desalination project and those caused by natural variability or other anthropogenic activities that are not attributed to the desalination project.

**Step 6- Investigation and evaluation of potential impacts of the project:** In this step of the EIA, a prognosis, description and evaluation of the potential environmental, socio-economic and health impacts of the pro- posed project is elaborated. Furthermore, the magnitude, spatial and temporal range of all identified impacts and their relative significance should be evaluated at this stage. Where possible, an attempt should be made to further distinguish between direct and indirect impacts, immediate and long-term impacts, reversible and irreversible impacts, avoidable and unavoidable impacts, positive and negative impacts. It is recommended that identified positive and negative effects are also balanced in terms of their societal and environmental costs and benefits.

**Step 7- Mitigation of negative effects:** In this step of impact mitigation should identify the most feasible and cost-effective measures to avoid, minimize or remedy significant negative impacts to levels acceptable to the regulatory agencies and the affected community. The definition of

‘acceptable’ will vary according to different national, regional or local environmental standards, which depend on a society's or com- munity’s social, ideological and cultural values, on economic potentials and on politics. For impacts which cannot be mitigated by technically and economically feasible methods, compensation methods should be identified. These may include monetary compensation or remediation activities. The elements of mitigation are organized into a hierarchy of actions.

**Step 8-Establishment of an environmental management plan:** An environmental management plan should be elaborated to ensure the ongoing assessment and review of the effects of the proposed desalination project during construction, commissioning, operation, maintenance, and decommissioning. It thus builds continuity into the EIA process and helps to optimize environmental benefits at each stage of project development.

- identify the actual environmental, socio- economic and public health impacts of the project and check if the observed impacts are within the levels predicted in the EIA;
- determine that mitigation measures or other conditions attached to project approval (e.g. by legislation) are properly implemented and work effectively;
- ensure that the expected benefits of the project are being achieved and maximized;
- gain information for improving similar projects and EIA practice in the future.

**Step 9- Review of the EIA and decision making process**: The purpose of review is to verify the completeness and quality of the information gathered in an EIA. This final step shall ensure that the information provided in the report complies with the Terms of Reference as defined during scoping and is sufficient for decision-making purposes. Review is a formal step in the EIA process and serves as a final check of the EIA report that will then be submitted for project approval.

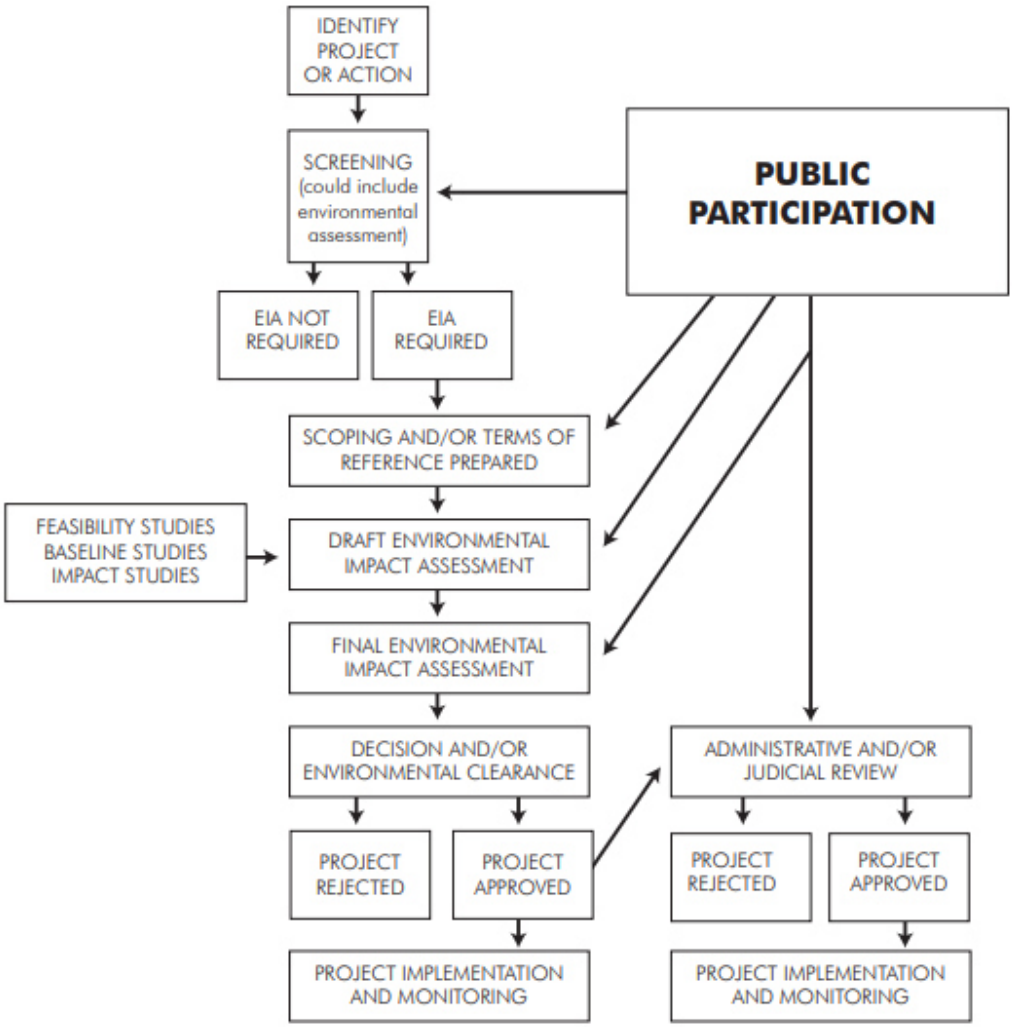
The review may be undertaken by the responsible authority itself, another governmental institution or an independent body. Participation of collaborating and advisory agencies in the re- view process is strongly recommended, as is the involvement of the public and major stake- holders in public hearings about the outcomes of the EIA. The review should follow a systematic approach. This will entail an evaluation and validation of the EIA methodology and procedure, and a check for consistency, plausibility and completeness of the identified impacts,

proposed alternatives and suggested mitigation measures. The review process can be based on explicit guidelines and criteria for review. If these are not available, it may draw on general principles, objectives and terms of references or use the following questions.

- Does the EIA report address the Terms of Reference?
- Is the requested information provided for each major component of the EIA report?
- Is the information correct and technically sound?
- Have the views and concerns of affected and interested parties been considered?
- Is the statement of the key findings complete and satisfactory, e.g. for significant impacts, proposed mitigation measures, etc.?
- Is the information clearly presented and understandable?
- Is the information sufficient for the purpose of decision-making and condition setting?

**Benefits of the EIA process:**

- Potentially screens out environmentally-unsound projects
- Proposes modified designs to reduce environmental impacts
- Identifies feasible alternatives - Predicts significant adverse impacts
- Identifies mitigation measures to reduce, offset, or eliminate major impacts
- Engages and informs potentially affected communities and individuals
- Influences decision-making and the development of terms and conditions


IDENTIFY PROJECT OR ACTION
SCREENING (could include environmental assessment)
PUBLIC PARTICIPATION
EIA NOT REQUIRED
EIA REQUIRED
SCOPING AND/OR TERMS OF REFERENCE PREPARED
FEASIBILITY STUDIES
BASELINE STUDIES
IMPACT STUDIES
DRAFT ENVIRONMENTAL IMPACT ASSESSMENT
FINAL ENVIRONMENTAL IMPACT ASSESSMENT
DECISION AND/OR ENVIRONMENTAL CLEARANCE
ADMINISTRATIVE AND/OR JUDICIAL REVIEW
PROJECT REJECTED
PROJECT APPROVED
PROJECT REJECTED
PROJECT APPROVED
PROJECT IMPLEMENTATION AND MONITORING
PROJECT IMPLEMENTATION AND MONITORING