

# THE IMPLEMENTATION OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) IN SOUTH AFRICA

By JAN GILIOME

FACULTY OF AGRICULTURE, UNIVERSITY OF STELLENBOSCH

## 1. SUMMARY

The public outcry over environmental damage caused by ill-considered planning has led many countries to institutionalise the EIA in regulating environmental change. In South Africa the growing public concern over the environmental damage caused by major projects, the formation of a council to represent all conservation bodies and the consensus over legislation the council has reached with the planning professions, clearly indicate that an EIA of development projects will in future also become compulsory here, possibly within the next three years.

## 2. THE NEED FOR A COMPREHENSIVE APPROACH TO PLANNING

In the production process resources are used which originally came from the natural environment, and waste materials are produced which ultimately end up in the natural environment (Fig. 1). Matter is changed in shape and quality, and transported to new localities. This causes concern over the depletion of resources on the one hand and the accumulation of waste materials on the other.

With the increase in the human population (and the concomitant urbanization) large scale developments, facilitated by modern technology, were undertaken to cater for the needs that arose. The waste materials that resulted were of such a quality and quantity that the assimilative or digestive capacity of the natural environment was exceeded. Pollution in all its forms (smoke, dust, noise, etc.) became much more perceivable. Moreover, it became evident that some natural ecosystems were being threatened or destroyed, not only through the accumulation of toxic waste products but by many developments themselves (e.g. the damming of water, building of roads, ploughing of land). More and more people became affected and were often disrupted by new developments over which they had little control. Concern over the "quality of the environment" became widespread and "ecology" a household word, though often misused.

It became clear that the days of the "cowboy economy" (Boulding 1968), where wide open spaces could still accommodate any development, were over and that we have entered a "spaceship economy", i.e. operating in a closed system, as shown in Fig. 1. The latter requires a holistic or comprehensive approach which recognizes the interrelatedness of the natural system, the man-made environment and human societies. This could not be left to the "good sense" of government and industries motivated by profit. Clearly, a new mechanism was needed to regulate environmental change and to ensure that all major development proposals were subjected to an examination of their total environmental consequences.

## 3. THE DEVELOPMENT OF ENVIRONMENTAL IMPACT ASSESSMENT

In order to encourage or enforce a comprehensive approach, the authorities in some of the developed countries of the world now require an environmental impact assessment or analysis (EIA) before approval is given for development projects. The question is whether South Africa will follow their example and, if we do, how developers in this country will be affected.

### 3.1 What is an environmental impact assessment?

An EIA refers to the investigation of the potential environmental and social impacts of major developments (see Table 1), policies

(such as a nuclear energy programme) and proposed legislation.

In the investigation well defined procedures and methods are used to assess the effects of specific proposals and to compare quantitatively the impacts of various alternatives. The results are presented to a reviewing body before a decision is taken to implement the proposals. Although emphasis is placed on impacts on the bio-physical environment, the effects of development on socio-cultural aspects are receiving more and more attention despite the lack of established methods for assessing social impacts (Bisset, 1978).

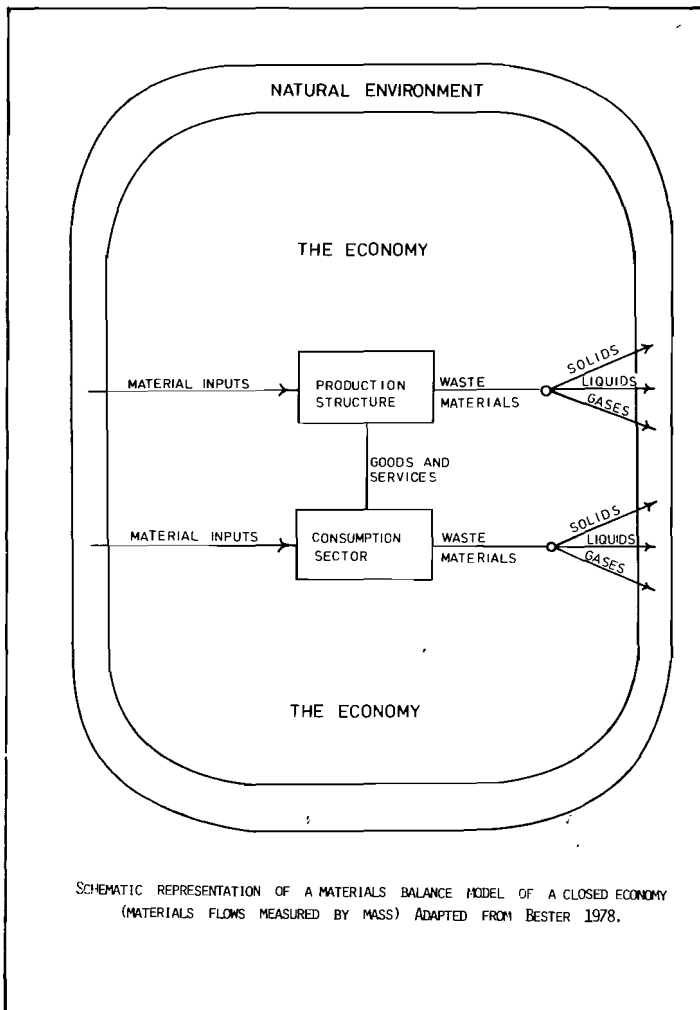
### 3.2 Environmental impact assessment and planning

It has been suggested that the idea of assessing environmental impact and making plans to deal with it began with Noah's Ark. Rudiments of EIA are implicit in early examples of legislation. Thus Napoleon in 1810 issued a decree which divided noxious occupants into categories: those which must be removed from habitations, those which may be permitted on the outskirts of towns, and those which can be tolerated even close to habitations, 'having regard to the importance of the work, to the nature of the soil, and to the importance of surrounding dwellings'.

**Table 1: The kind of development project and activity that may require an EIA (Adapted from Munn, 1975)**

GENERAL	SPECIFIC
1. Land use and transformation	Urban; industrial; airport; transportation; transmission lines; offshore structures.
2. Resource extraction	Drilling; mining; blasting; lumbering; commercial fishing and hunting
3. Resource renewal	Reforestation; wildlife management; fertilization; waste recycling; flood control
4. Agricultural processes	Growing crops (ploughing, fertilizing, irrigating); ranching; dairying; feed lots
5. Industrial processes	Iron and steel mills; petrochemical industry; smelters; pulp and paper plants.
6. Transportation	Railways; aircraft; roads; vehicles; shipping; pipelines.
7. Energy	Dams; oil; coal-fired and nuclear power stations
8. Water disposal and treatment	Ocean dumping; land fill; environmental contaminants and toxic substances; underground storage; biological emissions
9. Chemical treatment	Insect and disease control (pesticides); weed control (herbicides)
10. Recreation	Hunting areas; parks; resort development; all-terrain vehicles.

Source: Munn, R.E. (Ed.) 1975 *Environmental Impact Assessment: Principles and Procedures. Scope Report 5, Toronto.*



Current South African legislation to control smoke emission, water pollution and dumping of waste etc. embodies an implicit assessment of environmental impact but these measures are limited in scope since they only control specific actions. Also, EIA has no doubt played a part in many planning decisions, but it has never been an integral part of planning procedures and was never mandatory in South Africa.

In the United States a watershed was reached with the enactment of the National Environmental Policy Act (NEPA) on 1 January 1970. The Act required an environmental impact analysis and an environmental impact statement (EIS) for major Federal actions which may significantly affect the human environment. Federal actions were defined as those wholly or partially financed by a federal agency, and those financed from private resources under a federal licence, certificate, lease or permit. Some 60 percent of the American States have EIA requirements (Hall *et al.*, 1980) and California extended impact analysis to private development within the state boundaries (Wathern, 1976). During the seventies several other developed countries have adopted EIA procedures, in some form or another, in their planning and decisionmaking. These include Australia, Canada, the Federal Republic of Germany, France, Japan, New Zealand, Sweden and the United Kingdom. Among those considering EIA legislation are Ireland and the Netherlands, while the OECD Environment Committee recommended at the May 1979 ministerial meeting that its 24 members integrate comprehensive EIA procedures into their government processes (CEQ Report, 1979).

#### 4. AN EXAMPLE OF ENVIRONMENTAL IMPACT ASSESSMENT: THE PROCEDURE IN THE USA

Most countries follow the American system, though the actual procedures may be adapted to suit local requirements and the specific organizational structure of a society. It is therefore advisable to look at the American example as one possible model for future application in South Africa.

#### 4.1. Preparing and Environmental Impact Statements.

The requirements of an EIA in the USA and the methodologies employed have been described in various books, e.g. Warner & Preston (1973), Munn (1975), Jain, Urban and Stacey (1977), Canter (1977) and Lee & Koumjian (1978).

##### 4.1.1 The contents of an Environmental Impact Statement

A statutory body, the Environmental Protection Agency (EPA), oversees and controls the procedures. EPA requires a draft impact statement in which the relationship of the proposed development and the environment is discussed. Detailed information is required on the following aspect (section 102 of the Act):

- (i) The environmental impact of the proposed action;
- (ii) Any adverse environmental effects which cannot be avoided should the proposal be implemented;
- (iii) Alternatives to the proposed action;
- (iv) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long term productivity;
- (v) Any irreversible and irretrievable commitments of resources which would be involved if the proposed action should be implemented.

##### 4.1.2 Methodologies

Several methods have been devised in an attempt to do this comprehensively and quantitatively. Thus use is made of checklists, matrices, networks and map overlays as a means of identifying possible interactions between the development and the environment. *Checklists* are comprehensive lists of environmental parameters which can be effected by specific developments, requiring investigation. *Matrices* are typically composed of a list of developmental characteristics along one axis and a list of environmental attributes along the other. The cells of the matrix represent the interaction between individual aspects of an action and individual aspects of the environment. These may then be scored subjectively to indicate the level of an impact and its importance. Comparison of aggregated scores for various alternatives will then indicate the least disruptive way of development. Networks try to stipulate second and higher order impacts, e.g. insecticides may kill certain pests, but may also kill predators of other insects, which may in turn become pests, requiring further action, etc. *Map overlays* are used in planning to identify composite environmental factors (such as geology, physiography, soils, hydrology, vegetation and wild life) for a particular land use. By overlaying the plans for the development on each of the factor maps, impact can be specified. This method, using a South African example, is described by Giliomee (1978).

##### 4.1.3 Procedure

The procedure for testing the comprehensiveness of an EIA is described in the "Regulations for Implementing the Procedural Provisions" of NEPA. The draft statement is circulated, with a request for comments, to all Federal and Local agencies which have jurisdiction or special expertise with respect to any environmental impact involved. The agency preparing the statement shall also request comments from the public, affirmatively soliciting comments from those persons or organizations who may be interested or affected. A final statement is then prepared which must incorporate all comments and objections that have been received, together with a response to them. This is filed with the Council on Environmental Quality at least 30 days before development commences. Anyone who is not satisfied with the report may take the agency to court to obtain modifications.

#### 5. ENVIRONMENTAL IMPACT ASSESSMENT IN SOUTH AFRICA

In South Africa development projects are undertaken at the State, Provincial and Local government level and these authorities also control aspects of projects initiated by private enterprise. Thus provision is made for the control of water and air pollution, for the promotion of nature and soil conservation, for the establishment of national monuments and for the restoration of quarries, amongst other. The public is recognized only in so far as objections are

invited through advertisements before certain projects (such as quarrying, township development) are given the green light. There is no national environmental policy and no legal requirement which stipulates that environmental aspects be taken into account in the planning and execution of projects. Moreover, the State, Provincial and Local bodies as well as the statutory bodies, who regularly undertake major development projects, are exempt from most development controls applicable to private enterprise\*.

### 5.1 Mounting pressures to introduce impact assessment in planning in South Africa

In the early 1970's a number of large scale projects in ecologically sensitive areas aroused public concern over the general degradation of their environment, eg. the new national road through the Wilderness region (Anon, 1973), the iron ore export harbour at Saldanha, adjacent to the Langebaan Lagoon (Giliomee, 1973) and the subdivision of large stretches of coastline into building plots, particularly at Sandy Bay, Pringle Bay and Wavecrest (Batley, 1975). Strong appeals were made to the authorities to follow the American example of mandatory EIA.

The Council for Habitat, inaugurated in 1974 and representing some 50 organizations interested in conservation, gave attention to EIA right from its inception. In 1976 the Council for the Environment, consisting of representatives from 13 Government departments, the 4 Provincial Administrations and some statutory bodies, produced a report in which it is recommended that decision-making authorities request an EIA from developers in reviewing their proposals, and that the EIA be taken into consideration before final decisions on projects are made (Raad vir die Omgewing, 1976). The report also implies that an EIA will be produced for government projects.

Despite these recommendations, EIA has not been formally introduced and has not become part of the planning permission procedure, although EIA's have been produced for a number of *ad hoc* projects, such as the Linksfield reservoir (Hay, 1978). It appears that the government has been stalling on the issue, possibly for fears that it may delay development and increase costs, possibly because of the lack of expertise available to undertake the EIA and to evaluate them, and possibly because the Environmental Planning Professions Inter-disciplinary Committee (EPPIC) suggested that a Code of Practice for their members, rather than legislation, would be sufficient to ensure environmental protection.

In the mean time EPPIC and the Council for The Habitat, while they could not come to an agreement on the implementation of EIA, jointly studied the problems involved. A joint conference was organized (with backing of the then Department of Planning and Energy) in August 1979, which focussed not only on methods, but also on the role that self-discipline, legal measures and administrative mechanisms should play in the effective implementation of EIA in South Africa.

### 5.2 Specific proposals for environmental impact assessment in South Africa

At the 1979 conference a paper was read (Hall *et al.*, 1980) in which influential members of the engineering, architectural and legal profession participated. They stated that self-discipline, and the indi-

\* Recently (1980) a White Paper on a National Policy Regarding Environmental Conservation was published in which the following statement occurs: "In order to implement the broad environmental policy it is the aim of the Government that new development projects should be evaluated in the light of environmental considerations. The impact of such projects on both the natural and the man-made environment should become a normal consideration in the planning, development and operational phases of projects."

\* Provision is now made in the new Physical Planning and Utilization of Resources Bill for the proclamation of nature areas and the establishment of Management Committees from the private sector, thus introducing public participation in the process of planning of the natural environment. (Editor)

vidual and professional conscience could ideally ensure that adequate weight be given to environmental considerations. However, in our highly competitive society, where periods of rapid growth bring attractive profits to those who grasp opportunities fastest, developers are often confronted by irresistible temptations. The authors suggested also that in the public sector, the desire to get on with the job has sometimes led to unwise decisions and steam-roller planning. They concluded that there must be recourse to careful legislation which requires from the project initiator to disclose to the public an "environmental impact report", showing that environmental factors have been fully taken into account in the planning and design of the proposed project.

The authors purposefully steered away from the existing situation in the USA where the courts may interdict in development schemes if it could be shown that "the actual balance of costs and benefits clearly gave insufficient weight to environmental factors". In their view this comes close to the courts substituting its own judgement on the merits for that of the government agency. The local courts should therefore only judge whether there had been full and fair public disclosure, whether the environmental impact of the project has been adequately assessed, with due consideration to less harmful alternatives, but not on the merits of the proposal. They believe that this procedure will result in positive, more scientific and less emotional public participation.

There are now indications that the persuasive arguments in this paper have convinced EPPIC that legislation may be necessary, especially since it would afford protection to the highly motivated planner acting on instructions from entrepreneurs who may put pressure on them or employ less scrupulous planners. Thus consensus is reached between conservationists and the environmental planning professions.

The procedure specified by Hall *et al.* (1980) is not the only option open to the authorities. Fuggle (1980) indicates various other steps that can be taken, namely:

- (i) internal written evaluations of development proposals by public authorities;
- (ii) a statutory requirement for written evaluation of all aspects of an action with major environmental significance;
- (iii) mandatory reviews of all evaluations of development proposals before final decisions are taken, possibly with public involvement;
- (iv) creation of special review bodies to operate at both national and provincial levels.

## 6. CONCLUSION

Many countries institutionalised EIA in an effort to regulate change to the natural environment and a EIA of development projects will probably in the near future also become compulsory in South Africa. The implications of such a development for South Africa in general and the business community specifically are as follows:

6.1 If we heed the lessons learnt from the experience in the USA and elsewhere EIA need not act as serious constraint on development. In contrast, the benefits are such that prospective developers need not wait for the inevitable legislation before adopting EIA as a planning tool. What is required is a better understanding of the environmental factors and processes that may be affected by aspects of a project. This will not only help to sustain environmental quality but may help to sustain the project itself by reducing the possibility of objections by the public and the authorities, and costs associated with such objections. Thus a factory discharging effluent into a river, the sea or the atmosphere may eventually find that it has to make expensive alterations or close down whereas an EIA may have prescribed a location or design commensurate with environmental considerations. In the USA private developers are beginning to consider EIA a critical aspect of doing business responsibly (Lee & Koumjian, 1978).

6.2 An EIA will improve the functioning of the decision-making

authorities since their information will be more comprehensive. Knowledge of the expected side and long term effects of proposed developments will help them to ensure that precautions are taken to minimize detrimental impacts.

6.3 Strategies for natural environmental management should be incorporated into the planning and decision of public agencies, private planners and business leaders. These could vary between "public relations" exercises, whereby organisations devise new strategies to react to or accommodate environmental pressure groups, or technological innovations which could minimize the cost of waste management.

6.4 When the public is assured that the environmental price paid for progress is the lowest possible, conflicts over development projects will decrease and the image of the entrepreneurs will enhance.

6.5 The cost of some economic activities may increase in the short run due to the implementation of an EIA, but the social cost for society will decrease, provided that implementation is carried through in the correct manner. In the long run real cost should decrease due to innovations in environmental management.

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