



EDITORS'
SELECTION

REFORMING IMPACT ASSESSMENT: ISSUES, PREMISES, AND ELEMENTS

Jaro Mayda¹

This article summarizes the current problems of [environmental] impact assessment (**EIA** or **IA**),² comments on contemporary efforts to reform it, outlines the premises for a “re-engineering,” and suggests “integrated planning and assessment” (**IPA**) as the paradigm to take **EIA** out of the contemporary doldrums and make it into what it conceptually is: one of the key mechanisms for turning the world toward sustainable development.

THE STATE OF THE ART

It is an understatement to say that the “potential [of **EIA**] remains to be fully realized” (**ISEEA** 1994). Many studies have drawn attention to this fact. Insiders have asked, “Do **EIA** methods have a future?” (Beanlands 1983);

¹ Dr. Jaro Mayda is professor emeritus of law and public policy, University of Puerto Rico. His current address is 9050 Funchal, Madeira, Portugal; fax: 351 91 226254.

² A valid distinction can be made between **EIA** as the whole process, consisting of the appropriate **IAs**, including an ecological **IA**. See Figure 1, which also specifies economic and social cost-benefit analysis (**CBA**). The recent call for examples of good/poor integration of **CBA** into **EIA** (Hamm/Abaza, *IAIA Newsletter* 6:1), and the reported consensus that the various project evaluations (risk, health, and environmental/ecological, and socio-economic) should be “more closely linked” (**CEMP** 1994), reveal the state of the art. **EIA** without an overall **CBA** is a useless document; the problem is the development and general acceptance of adequate, standardized indices for non-quantifiable values.

outsiders have described the process as a “boondoggle” (Schindler 1976) or have written about “generally unimaginative procedures such as EIA” (Pearce 1993). In fact, a typical EIA is often a collection of data and information inadequately processed for decision making and management. The process of conversion of data (input) to decisional options/recommendations (output) is schematized in figure 2.

The discussion here focuses on the conceptual and methodological aspects of impact assessment. The political and economic causes of the unsatisfactory role of EIA in decision making are well known. Because of them, more than 25 years after the U.S. National Environmental Policy Act introduced the concept, and almost 24 years after the U.N. Conference on the Human Environment (Stockholm), the world’s environment is, on the whole, in worse shape, even considering that some major impacts, such as the problem of stratospheric ozone and the ‘greenhouse’ effect, were identified or began to be paid attention to only in the 1970s and 1980s. The Rio de Janeiro UNCED (1992) could have provided guidance. Instead, it made only minimal references to EIA in the various documents on climate change, biodiversity, and forest principles. Even the one subparagraph (s. 8.5b) in Agenda 21 lacks a conceptual ‘deep structure’, not to mention an operational model.

But the impact assessment theorists and practitioners, even in the most developed countries, must accept a share of the blame. Left to its own wits, as it were, the IA community needs to respond by more than a restatement of “what has worked well”; or even to take conceptual refuge in the highly touted ‘new’ strategic EA. For SEA is, despite the best efforts to give it an autonomous meaning (e.g., Lee and Walsh 1992) and animated endorsements (e.g., Sheate 1992), merely a warmed-up programmatic EIA (US CEQ 1973: par. 1500), the purpose of which was not to integrate planning and assessment at the beginning of the action, but to reduce delays and litigation at the end. The ‘new’ fashionable formula *policies, plans, and programs* appeared first already in 1970 ([U.S.] Executive Order 11514).

WHERE AND HOW TO REALLY START

Where to start? At the bottom, of course—with precise language, as the foundation of professional concepts and analysis. The contrast between us and our neighbors in economics is striking: the ‘environmentalists’ may have the reason, but the economists have the lexicon and syntax. Calls for

standardized terminology (Coates 1987) and for “agreed-upon concepts” (Burdge 1991: 101) are symptomatic, but not widely heeded. To “put rhetoric into action” is not a response; the first question is about the quality of the rhetoric. Technical terms can be precise without being encased in “specific legal definitions” (IAIA 1991; call for a glossary).

One “response” has been a proliferation of acronyms (CEA-CC: Cumulative EA-Carrying Capacity; FEA: Focused EAE; PoIA: Policy Impact Assessment; etc.). This alphabet soup is further confused when the acronym EA is substituted for EIA, as in the current international effectiveness study (Sadler 1994), since the acronym EA means several quite different things: EIA in Canada, United Kingdom, etc. ; collection of global environmental data (such as Earthwatch) in UNEP terminology; initial assessment to determine whether a full EIA is needed (US NEPA practice); a process to ensure that “the development options are environmentally sound and sustainable” (World Bank, since the late 1980s); etc.

The call is for elegance, meaning simplicity, clarity, consistency, and uniformity. A possible basic lexicon, based on a 1981 document prepared for the U.N. Economic Commission for Europe, is represented in figure 1 (on the next page).

Referring to figure 1, if “data” means quantified facts and “information” is unquantified, then a further uniformity in understanding can be achieved by saying—

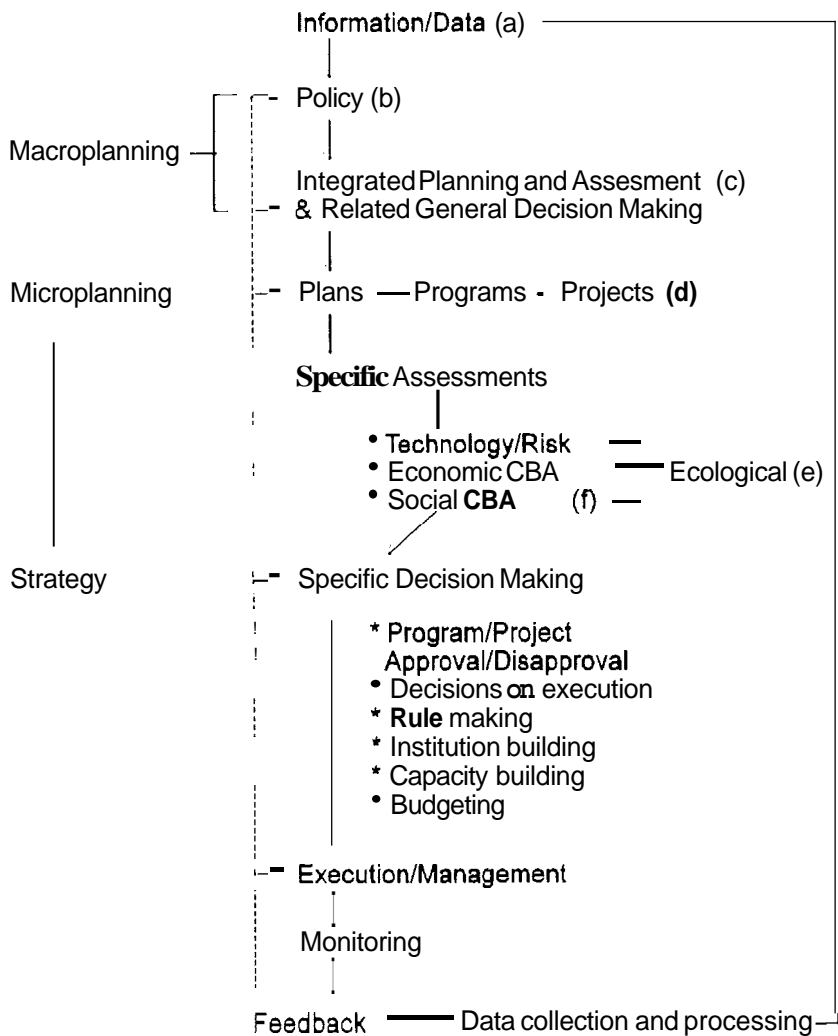
$$\text{Data} + \text{Information} = \text{Knowledge.}$$

Projecting this semantic equation further toward decision making under uncertainty (which is the normal situation, to be briefly discussed below), yields—

$$\text{Knowledge} + \text{Intuition} = \text{Base for decision making.}$$

Those are more likely bricks to build a new impact assessment mansion of.

Figure 1. Uniform impact assessment nomenclature in its operational context



MACROCONCEPT TO CLARIFY AND BUILD INTO THE NEW PARADIGM

1. **Policy and its relation to planning and assessment.** The still-used old dictionary sense of policy as *a course of action*, has been supplemented in recent decades by a more indicated meaning: *policy as a goal or set of goals* (“what ought to be”) *to govern the course of action/decision* (“what is”). In other words, policy as a directive, not a direction (Mayda 1968: 119).³

The “modern” definition of policy has at least these semantic advantages: (1) it tightens the technical meaning of the term; (2) it helps to distinguish policy development from decision making (often wrapped together in the indiscriminate term “policy making/maker” (Mayda 1996); (3) it distinguishes policy from planning (search for the best course of action or strategy). In addition, by promoting a clearer understanding of the relation of policy to decision making, it facilitates the perception of **EIA** as a policy exercise (what *ought* to be or *can* be in a specific assessment situation) and thereby nestles it in a broader conceptual-theoretical frame.

2. **A better understanding of the process from baseline data to the final decision** (as sketched out in figure 2).

A major conclusion to be drawn from this organic sequence concerns the futility of the belief that scientific data can be so “formatted” as to be “directly” useful to the decision makers (SCOPE 1990), and of the related quantification syndrome (“Better quantified and wrong, than qualified and untestable,” was the title of a 1985 paper).

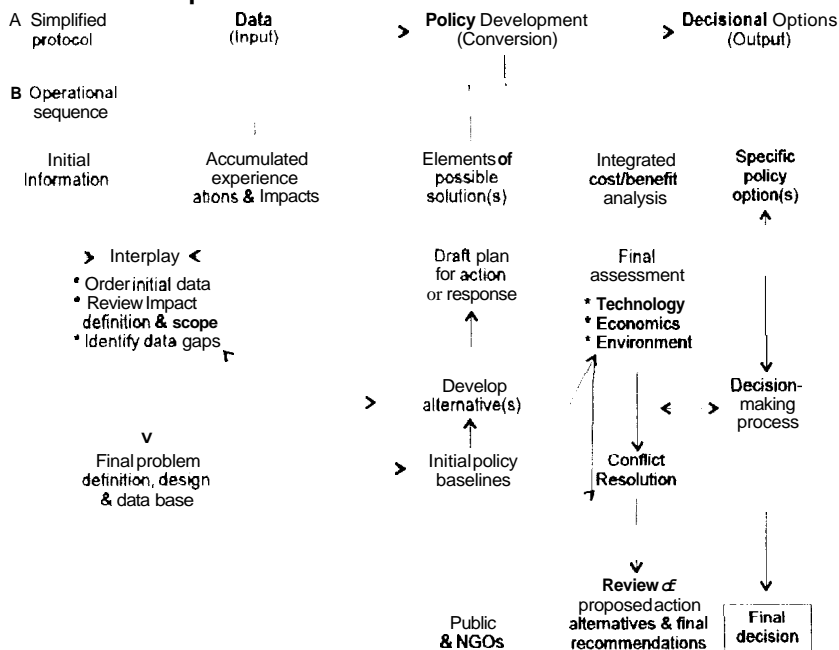
The scientific model is not the decisional model. What may be a complete data base in the scientific, technical, and even economic-budgetary sense is almost never a sufficient base for political decision making. The latter needs, in addition to data, much information about the political, legal, institutional, social, and cultural conditions and restraints. The current emphasis on public and NGO participation in the

³ This ‘new’ meaning will be added in the current revision of the Oxford English Dictionary (OED 1994).

EIA process is about the injection into decision making of some of this least quantifiable information.

Also needed is a new class of “specialists in generalization” (Mayda 1968: 10), integrators able to communicate with both extremes of the policy continuum, and to provide the bridge between the worlds of knowledge and of decision making. The formalization of this link must overcome the cultural resistance of our overspecialized world.

Figure 2. Integrated project design and impact assessment sequence



- Decision making under uncertainty** must be accepted as the normal situation, and honed to provide tolerable and adjustable decisions even under severe conditions. Practical decision making does not wait for neat

complete data. Scientific uncertainty is rarely a critical barrier to acceptable decision making (Bidwell 1987).

If the best result one can expect from an IA is a correct inference based on incomplete data, there are many examples of such scientific inferences that were proven essentially correct with the help of supercomputers (the great Tambora eruption, 1815; Ulugh Beg's new astronomical tables, 15th century; "back-of-the-envelope" estimates of human impact on the ozone layer, as compared with three massive U.S. and international studies 10 years later; etc). These instances support the dicta about "old-fashioned common sense" (E.P. Odum), "sound engineering judgment" (US EPA), "even crudest observation will yield viable results [when data is lacking]" (US Natl Research Council), etc.

4. **Contemporary neuroscience** is of great help in understanding human, including political, decision making, as a mixture of analysis and intuitive synthesis. The empirical model of the interacting left and right brain spheres of Roger Sperry and his colleagues (Nobel Prize for Physiology and Medicine, 1981) facilitated the understanding of how "human intelligence processes information and stores experience in an analysis-synthesis interaction" and related it to "the perception and solving of EIA problems" (Mayda 1982). Intuition as a capacity to fill gaps and connect apparently disparate pieces of knowledge is an ever-present element in decision making. The task of policy development (including EIA) is to help the special-interest-driven hunches to become educated intuition.

TOWARD INTEGRATED PLANNING AND ASSESSMENT

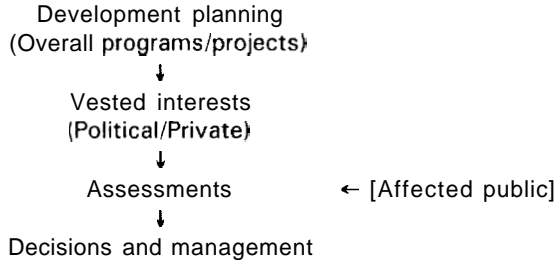
In the search for a new paradigm, impact assessment can build on a set of strands going back almost 30 years (Mayda 1993). More recently, many items in assessment-related legislation, documents and articles, from Furtado (1987) through New Zealand (1991) to Burdge (1994), at least imply various elements of the new model.

I have tentatively styled it "integrated planning and assessment" (IPA). The term requires some clarification. It is more than 'environmental' in the current sense; hence this term is dropped, without affecting the *primus inter pares* standing of 'ecological' IA (see figure 1). The other missing term is 'impact'. Although 'impact' has recently developed what dictionaries call a

'transitive sense', its chief meaning in our field is still negative. An action, however, can (and under the policy of sustainable development, must) also have a positive effect on the natural environment. Many countries use other terms (in Germany it is 'compatibility'; in New Zealand 'effect'). Even in English, several types of assessment do without the word impact (for example, technology or risk assessment).

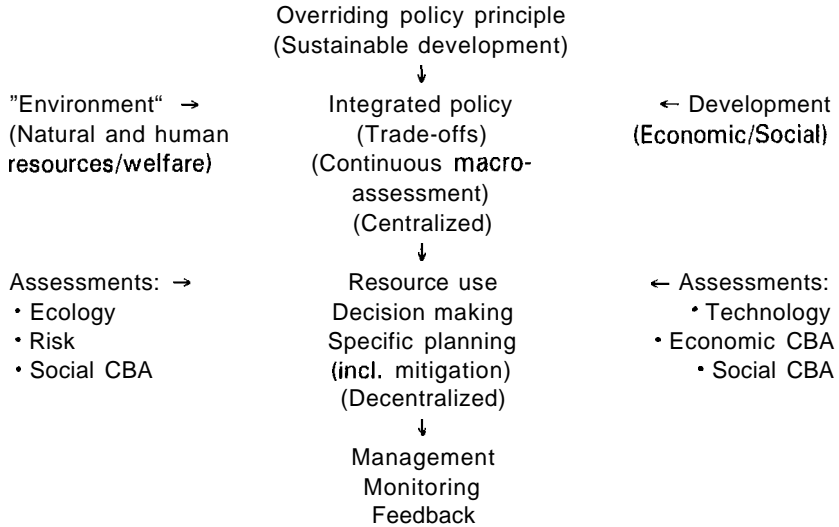
More important than terminology is the structure of the new model directed at removing **the** greatest weakness of the EIA practice: that the ecological assessment comes typically only after the engineering design, the economic/financial planning and/or the investment in political prestige have reached a point at which the "no action" recommendation is practically excluded, the redesign or other siting are severely limited, and the assessment is reduced to a search for, and the rationalization of, mitigation measures (with no assurance that they will be applied and monitored).

The current sequential model can be schematized as follows:



The as-much-as-possible *parallel* IPA is represented by the diagram on the following page (to be read with reference to figure 1):

The obstacles to such a practice are formidable. They are political (the proceedings of the third session of the U.N. Commission on Sustainable Development were characterized by "systematic unravelling of Agenda 21 language. . . governments unable and unwilling to alter the policies that are driving unsustainable development" (ENB 1995)) and professional (the education and commitment of a new breed of planners and assessment professionals). It requires no new legislation (except where there is none at all, of course); but law alone cannot do it, not even such a progressive item as the New Zealand Act of 1991. The challenge is to move in the right direction ahead of the decision makers.



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