

Environmental protection in South Africa

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Synopsis

Society is fully justified in its concern about the environment, but that concern may, at present, be too uncritical. It is, for instance, essential to establish that there is a valid environmental impact, and that there is truly a causal link between a human activity and an observed shift in environmental conditions. In establishing these, it is essential to recognize that scientific proof offers consistency, but that it can never provide completeness. Thus, no amount of scientific endeavour can ever prove that mitigation of the effects of human activity will be perfect.

Society normally expresses its concern through legislation. The existing legislation in South Africa is reviewed, and it is found that

- *legislation regarding water is probably too stringent to be effective,*
- *legislation regarding air and land use is probably too lax,*
- *all the environmental legislation is too fragmented to be efficient, and*

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Introduction

At the meeting of the Controlling Executive of The Associated Scientific and Technical Societies of South Africa (AS&TS) on 28th October, 1993, the Committee for Science, Engineering & Technology raised the question of the role of AS&TS in environmental matters. Many of the Member Societies are active in this field, either independently or jointly through groupings such as EPPIC. AS&TS has been directly represented on bodies such as the Habitat Council in the past, but such representation has often been *ad hominem* in nature. AS&TS does not appear to have developed a specific policy for itself.

It is thus the purpose of this paper to offer a view on environmental matters in South Africa in the hope that a greater understanding of the issues involved will permit AS&TS to formulate policies that will enable it to initially interpret and eventually fulfil its overall mission in this specific area.

Society and the Environment

Few can doubt that the global society is increasingly concerned about the possible impact of mankind's activities on the environment.

However, this statement must not be taken critically. There is, for instance, concern over the possible impact. In a number of cases it has proved very difficult to establish whether there is indeed an impact, and in other cases whether there is a causal link between an observed shift in environmental conditions and a human activity. Where there is a clear impact and a causal link, then mankind has proved quite adept at altering its behaviour to mitigate the impact. Excellent examples are to be found in the way developed societies have improved the air quality over their cities, or the water quality in their rivers. The problem arises where the impact is unclear, or where the linkage is weak.

The example of nuclear power may clarify the problem of impact. Nearly half a century of commercial operation has proved that nuclear fuel is the safest available means of generating energy. *Technically*, it is safe. However, the apparent threat posed by radionuclides, particularly the long-lived fission products, makes nuclear generation *politically* unacceptable to many. It is technically possible to reduce the environmental impact of radionuclides effectively to zero, but mankind has not yet reached the point where such solutions are acceptable politically.

Similarly, there is an excellent example of the problem of linkage in the debate surrounding electromagnetic radiation. 'Clusters' of persons suffering from cancers have been identified in close proximity to sources of electromagnetic radiation. However, there is at present absolutely no evidence to suggest that the radiation field has triggered the cancers. Certainly, counter-examples can be found aplenty, where large populations are exposed to similar fields yet show *no* evidence of a carcinogenic effect. Equally, some such 'clusters' should be found in small areas in any epidemiological study because of statistical effects; so, the problem is compounded by that of deciding whether the identified 'clusters' are statistically significant. Positive linkage of electromagnetic fields to cancer has so far not been established.

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► *the Department of Environmental Affairs is hamstrung by inter-departmental rivalry.*

It is accordingly concluded that, if means are to be found for ensuring adequate mitigation of environmental impact in the face of ongoing economic development, it is necessary to establish a Judicial Commission on Environmental Affairs advised by, but given greater powers than, the departments currently active in environmental matters. This Commission should be charged with creating, perhaps over a decade, a body of legislation that would guide development while protecting the environment in its widest sense.

Global concern about the environment has led to the formulation of the 'precautionary principle'. This states that any given human activity is likely to have an impact, and that society must assume that the impact will be adverse until proven otherwise. The problem is that attempts to 'prove' no impact always contain an element of doubt in the 'proof'. Any critic of the 'proof' can always show that there exists an unlikely but plausible potential for impact that the 'proof' does not consider. However, this overlooks the fact that scientific enquiry does not, cannot, and never has laid claim to proofs enjoying completeness—it can only show consistency. For example, the fact that science today has a consistent theory, stretching in time from about the 1940s after the 'big bang' to the present, is taken by some to imply completeness, which is impossible. Thus, the 'precautionary principle' demands a standard of proof that cannot be met—and accordingly it should be rejected in all scientific approaches to environmental matters. The principle does, however, provide some basis for public policies, and indeed underlies many of the decisions taken at last year's Earth Summit.

It is essential to be absolutely clear about what is meant by *the environment*. Mankind has shown an unfortunate tendency to be uncritical in its definition, and this has led to such disasters as the explosion in the elephant population arising from the listing of elephants as an 'endangered species'; or the destruction of *fynbos* when it was 'protected' against those very fires that are essential for its propagation.

Furthermore, it is not a purely philosophical question to enquire into the extent to which mankind is part of the environment; indeed, it raises some very interesting challenges! What, for instance, should be done about the explosion in the *human* population? There are those who would say that this, and this alone, is the source of all environmental problems. Undoubtedly, mankind's activities can have an adverse effect on the environment, which in turn can have an adverse effect on the population, and this results in the involvement of health authorities. However, it does not necessarily follow that the health authorities are properly equipped to deal with environmental impacts *per se* . To the contrary, there is every evidence to suggest that they are very improperly equipped. They can do little more than draw attention to an epidemiology that arises from an adverse environmental effect, and assist in setting the standards that should be met if the effects are to be minimized.

Provided, therefore, due note is taken of the caveats, we can accept that society is justified in being concerned about mankind's impact on the environment. Normally, when society is worried by or about something, it formalizes its concerns in law. Accordingly, we need to consider the present legal status of 'the environment' in South Africa.

The Legal Aspects of the Environment

First and foremost there is water. Possibly because of the shortage of water in South Africa, there is almost more legislation about water than about any other topic¹. There is a Department specifically concerned with Water Affairs; and there are even special Water Courts.

The primary concerns of the legislation are water flow and usage; quality is somewhat secondary. Nevertheless, the legislators have felt that control of quality is sufficiently important to make water pollution a criminal matter; indeed, the Minister of Water Affairs is empowered to close down any enterprise that has been found to pollute. In one of the last pieces of legislation before the Transitional Executive Council (TEC) came into effect, the Act was amended by the incorporation of two sections (22a and 22b) to cover 'acute' pollution, i.e. that arising from accidental spills, rather than chronic pollution.

However, there are two problems with the criminalizing of pollution. First, policing is essential to enforce the law. To be true, there is an Inspectorate, but it is so short-staffed as to be distinctly ineffectual. Secondly, the very criminalization of pollution makes avoidance and evasion profitable. The avoiders dilute, paying for the privilege with additional fresh water; the evaders dilute illegally, and do not pay.

With the devolution of power to lower levels in the new South Africa, it may be possible to increase the level of policing and thus reduce the pollution of our water by industry. However, it is equally possible that the long-term failure to provide informal settlements with piped water will lead to increasing abuse of rivers and increasing pollution from domestic sources, as has already happened in many parts of the country.

When we turn to air pollution, a totally different picture emerges. The Department of National Health & Population Development administers the primary Act². The Act establishes a National Air Pollution Advisory Committee to advise the Minister on the establishment of such things as 'Controlled Areas', within which the volume of a particular pollutant discharged into the air is controlled by permit.

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The trouble with *this* approach is that it is not 'transparent'. The Minister is advised, and his decision is essentially final. The most prominent Controlled Area is in the eastern Transvaal, where a 'sulphur triangle' has been established. This triangle prohibits any increase in the SO_x releases in the area, a measure aimed primarily at the Eskom power stations. As Eskom has pointed out (and this has been confirmed by independent studies³), the primary problem with SO_x in the area arises from ground-level sources such as burning coal wastes. Eskom's emissions take place well above any inversion layer and are dissipated in areas quite remote from the 'triangle'.

Should an inappropriate agency (the Department of National Health & Population Development) really administer an ineffective law and have the power to inflict possibly terminal economic damage without any hope of redress? Should the Department continue in this role while air pollution in such areas as the Vaal Triangle reaches levels not permitted in developed society elsewhere⁴? Clearly, society is not achieving its objective of controlling air pollution in this manner.

Let us turn now to what most people would consider our true heritage: that part of our natural environment in need of conservation. Protection is afforded by the Environmental Conservation Act No. 73 of 1989, which is administered by the Department of Environmental Affairs. This Act is somewhat more enlightened and democratic than the Air Pollution Act: not only is there a Council for the Environment to advise the Minister, but a Committee for Environmental Management to advise the Director-General and several Management Advisory Committees to advise the administrators of the various provinces.

Important measures in this Act include Section 21, which identifies activities that, in the Minister's opinion, *may* have a substantial detrimental effect; and Section 22 prohibits any such identified activity unless authorized *after* an Environmental Impact Report has been considered. The Department published its first draft of an Integrated Environmental Management Procedure, in terms of which an Environmental Impact Report is to be prepared, in 1989; a second draft was published in 1992.

The whole topic of integration of environmental management is so difficult that details of the present proposals are reviewed in the next section of this paper. For the moment it suffices to note that

- the draft procedure has been 'test-run' on the St Lucia proposal,
- this test run has revealed considerable problems in scoping, reporting, and reviewing the proposal according to the draft guidelines, and
- it has thrown up a most interesting point, namely whether environmental legislation can, or indeed should, take precedence over the long-standing mineral exploration legislation in which it has been implicit that the granting of a right to explore confers the right to mine, under reasonable conditions, if the exploration is successful.

The last point highlights the major problem with the drafts, namely that they impinge upon a whole range of other legislation and, where that legislation is administered by departments other than the Department of Environmental Affairs, those other departments see the procedure as impacting adversely on their own administrative territory and accordingly do not support it beyond mere lip service.

Possibly for this reason, the *only* regulations published in terms of the Act (up till August 1993) were regulations concerning noise pollution by lawnmowers, radios, dustmen, and the like in certain specified urban areas⁵.

Air, water, and land must surely be at the heart of environmental policy and legislation. As indicated earlier, the water policy appears to err on the side of the draconian; that on air and land appears to be flaccid. The preservation of the essential fabric of our nation deserves a consistent, logical, and just system of law, which it lacks at present.

There are, of course, a multiplicity of other bits of environmental legislation, some of which deserve mention. There is, for instance, the Hazardous Substances Act No. 15 of 1973, administered by the Department of National Health & Population Development. This Act declares certain substances to belong to certain hazardous groups, and then regulates the transportation, storage, use, dumping, etc. of each group. The same Department also administers the Health Act No. 63 of 1977, which regulates water and soil pollution in terms of Section 33. The intent of this legislation is, of course, ultimately to protect the individual, rather than to protect the environment as a whole.

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Then there is the legislation regarding those bits of the biosphere that do *not* include man, and that fall under Departments such as Agriculture, Fisheries, and Forestry. By and large, they do an adequate job, but the whole thrust of such legislation reflects the old South Africa to an unfortunate extent—'the Minister, acting on the advice of the Director-General, may decide...'

With this background, we have to ask what might be needed to establish a more sensible approach to environmental affairs than the present structures. Firstly, it is clear that the existing fragmented approach is unlikely to succeed. The Department of Water Affairs, for instance, may have been given the power to prosecute polluters of water, but it is powerless to assist those informal settlements that have turned nearby waterways into cesspools.

Secondly, the present focus on the human health aspects of the environment is misplaced. The Department of National Health & Population Development has been given considerable powers, but the Department, by its very nature, must concentrate ultimately on the individual. The Department can *identify* possible health hazards arising from mankind's impact on the environment; it can *propose standards* to reduce the hazards; but it is very poorly placed to minimize the impact *per se*. Its role in environmental matters should be advisory, rather than regulatory.

Thirdly, the State may have recognized these problems when it created the Department of Environmental Affairs seven years ago, but it is by no means apparent that the Department has been effective. It has managed to identify a tiny niche in the interdepartmental logjam, namely urban noise pollution, and has filled that niche with paper, but it has not yet succeeded in coming forward with an implementable environmental policy.

However, to be fair to the Department, it has managed to produce a draft Integrated Environmental Management Procedure (IEMP), and has test-run the procedure. From what has been said above, this is clearly what is needed. Let us therefore examine the IEMP, to see the extent to which it might meet the conflicting demands of society.

The Integrated Environmental Management Procedure

The details of the IEMP have evolved over the past five years, and the second draft was published in July 1992. The procedure foresees the following steps:

1. *The formulation of a Proposal.* This should place an intended project (in its widest sense) in its environmental setting, considering such things as the physical characteristics of the site, the ecology, the current and intended land use, the cultural resources of the site (including archaeological and historical aspects), and a host of other environmental characteristics for which a checklist is given in Volume 5 of the IEMP. The Proposal must then be 'scoped'. No dictionary definition of such a verb, transitive or intransitive, is known. Fortunately, Volume 6 of the IEMP gives a glossary, which describes 'scoping' as *procedure for narrowing the scope of an assessment and ensuring that the assessment remains focussed on the truly significant issues or impacts.* Volume 2 of the IEMP sets guidelines for scoping, and it is apparent that, first, the Proposal must be broadened as far as possible to make certain that the scope is truly inclusive, and only then narrowed and focussed. Broadening requires identifying and informing all authorities and *Interested-and-Affected-Parties (I&AP's)*. These must be afforded the opportunity of adding possible impacts to the assessment. The assessment of the Proposal can then focus on the key issues that have emerged. A critical outcome of the assessment is whether the Proposal will or will not involve significant environmental impacts.
- 2A. If the Proposal is assessed as having *no* significant impacts, then the proposer can make an Initial Assessment Report (IAR), which will be reviewed (for 'Review', see 3). This Report should define any potentially adverse impacts and state what actions will be taken to mitigate such impacts. The Proposal can be revised and re-scoped if an initial assessment reveals that significant environmental impacts can be avoided by modifying the Proposal.

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- 2B. If, however, the initial assessment reveals that the Proposal is indeed likely to have an impact, then the proposer must produce an Environmental Impact Assessment (EIA). The EIA should consider a range of alternative actions to achieve specified objectives within a framework of legal and administrative constraints. Each alternative method for achieving the Proposal's objectives should specify what it is intended to do, what part of the environment is likely to be affected by such actions, and offer an Assessment, i.e. analyse and synthesize all the information regarding the environmental impacts of the Proposal. Care must be taken that the set of objectives is complete and fully describes the proposal. If the EIA reveals that the Proposal is unlikely to have any significant impacts, the Proposal may be modified and an IAR prepared for Review; alternatively, if the EIA reveals that the Proposal is likely to have significant impact that will be difficult to mitigate, the Proposal may be re-defined and re-scoped.
3. Either the IAR or the EIA is then submitted for Review. The relevant authorities carry out a check for completeness and conformance with statute and regulation. Specialists review all technical aspects for quantitative correctness, technical achievability, etc. Finally, there must be a public review of the policies, the impacts, and the recommendations. There are three possible outcomes:

- i. the Proposal can be held in abeyance while further information is sought before the Review is re-initiated; or
 - ii. the Proposal can be rejected, in which case the proposer has the right of appeal; or
 - iii. the Proposal can be accepted conditionally.
4. If the Proposal is accepted conditionally, the State and the proposer must agree to the conditions. These may be so onerous that the proposer feels the Proposal is no longer viable, in which case there is a right of appeal against the conditions. If, however, the proposer accepts the conditions, the Proposal can proceed.

A flow diagram of the whole IEMP is shown in Figure 1, with decision points enclosed in diamonds and dotted lines indicating a reversal of the direction of progress towards the implementation of the Proposal. Clearly, the IEMP is likely to be a time-consuming, and therefore expensive, procedure. The IEMP has, as noted earlier, been test-run through the proposal to mine the Trojan-Kingsma lease areas of the eastern shores of Lake St Lucia, and it is perhaps desirable that we review the Procedure in this light.

The St Lucia Proposal and the IEMP

It is not altogether surprising, in view of the evolutionary nature of the IEMP, that a number of flaws should have become evident during its test-run on the St Lucia proposal. The critical problems are probably as follows.

- The initial assessment did *not* consider the full range of alternative land uses, so that, for instance, the environmental impact of deforestation or of the return of land to its original inhabitants for subsistence agriculture was not considered.
- Possibly because of the above, a proponent of the 'tourism' option was identified only fairly late in the process, in the form of the Natal Parks Board (NPB). Because the NPB entered the process rather late, their own EIA was incomplete and highly flawed. What this underlines is that the IEMP fails to recognize that *each* alternative land use requires an alternative land user and, unless that user is prepared to come forward to formulate a proposal and go through the same IEMP as the first proposer, the alternative land use must remain hypothetical. This is perhaps the most fundamental philosophical flaw in the IEMP as proposed at present.

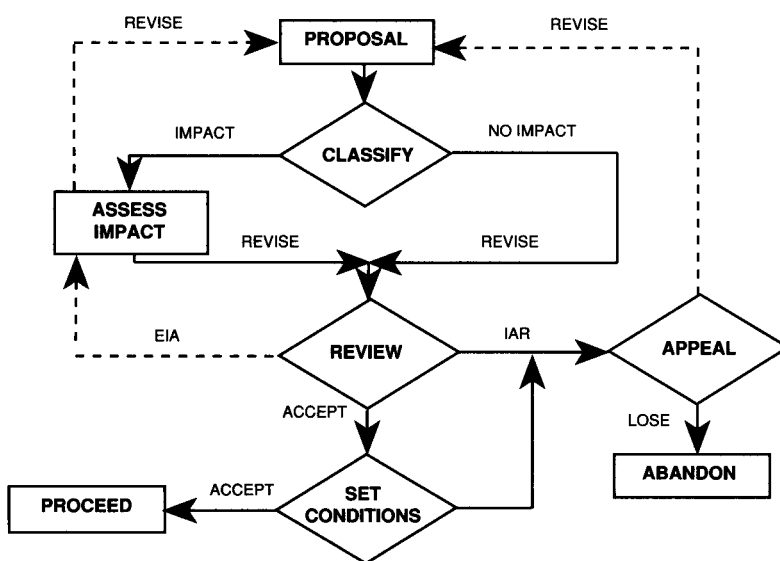


Figure 1—The Integrated Environmental Management Procedure

- ▶ No closure was placed on the scoping process, so that 'late entries' in the list of I&AP's became inevitable. This allowed an activist group operating under the Ramsar Convention to arrive late on the scene, and issue a report after the most cursory of examinations, which seized such hold on the imaginations of some staff in the Department of Environmental Affairs that they seriously proposed by-passing the entire IEMP and placing the Ramsar group's report before the Cabinet as the last word on the subject. It should be noted that administrative review had thrown considerable doubt on whether the site fell under the Ramsar jurisdiction, and therefore it has to be doubted whether the Ramsar group had any *locus standi* at all. As this was a trial run, it was probably in the best interests of all concerned that the definition of an I&AP be as widely interpreted as possible, so that questions of *locus standi* were irrelevant. Nevertheless, any future IEMP should seriously consider whether, in the definition of an I&AP, the '&' is important. Clearly, there were many who were interested, and some who were affected, but the question must be posed as to whether it is only those who are *both* interested *and* affected who should have standing; alternatively, whether the process would not be speeded and simplified if the views of those who were only interested were given less weight than the views of the affected.
- ▶ The technical review was relatively unstructured. This became particularly apparent when a hydrological report was issued that assumed certain geotechnical parameters, to be followed by a geological report that gave quite different geotechnical parameters. To some extent, this appeared to be the result of time pressures. The Department recognized that the IEMP involved a protracted process, and therefore tried to shorten the process as far as practicable in order to prevent time and costs from becoming excessive.
- ▶ The final review appears to have erred on the side of the intangible. The Review Panel under Mr Justice Leon ruled against the mining of the lease areas on the grounds that they have 'special' characteristics and that there is 'uncertainty' about the extent to which the land could be restored after mining. This clearly shows that the 'Precautionary Principle' has emerged in South Africa. The Specialist Reports in the EIA of the Proposal demonstrated that it was highly probable that restoration would be effective. It has to be asked whether this judgement does not introduce a new measure of proof into our judicial system, in which the balance of probabilities is replaced by a balance of certainty.
- ▶ The failure to achieve a positive Review also throws into doubt the whole rationale of the IEMP. The St Lucia Proposal was the most thoroughly evaluated proposal yet seen in South Africa and, as such, consumed vast resources of time, management skills and, ultimately, money. *If* such effort cannot lead to a satisfactory solution, where development can be allowed to proceed under such conditions that environmental impact is minimized, *then* few would care to follow the Procedure with the same thoroughness. The Department's test-run was a failure.

A Possible Policy for the Future

As a result of the preceding analysis, it becomes possible to suggest certain policies.

Firstly, it is probably essential to adopt a stance that, on scientific grounds, there are few areas of development where conditions cannot be found such that, if the development proceeds, environmental impacts can be minimized. This is perhaps a rather back-to-front way of saying that development and environmental protection are *not* incompatible, and that what is needed to make them compatible is a proper evaluation of the environmental threats and the means for their mitigation. There are, of course, those who would argue that development and environmental protection are indeed incompatible; this can be answered only by pointing to the direct correlation between the state of development of a society and the level of environmental legislation. There are, demonstrably, low levels of environmental protection in developing societies.

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1. In addition to the Water Act No. 54 of 1956, a further 96 acts are administered by the Department of Water Affairs.
2. Air Pollution Prevention Act No. 45 of 1965.
3. Tyson, Kruger, and Louw 'Atmospheric pollution and its implications in the eastern Transvaal Highveld'. CSIR Report No. 150, 1988.
4. Vaal Triangle air pollution health study, progress report for 1993, CSIR Environmental Studies, Oct. 1993.
5. e.g. *Government Gazette* no. 12816, R.2544, 2nd Nov. 1990, which extended noise control to the municipalities of Simon's Town, Potchefstroom, Pietermaritzburg, Danielskuil, Bethlehem, Greyton, Beacon Bay, Pretoria, Koffiefontein, and Sandton.

Secondly, it is clear that we have to strive to ensure that evaluation takes place according to the balance of probabilities, *not* proof of certainty. As shown earlier, scientific proofs enjoy consistency and suffer from incompleteness; so there can *never* be proof of certainty.

Thirdly, we need a more appropriate structure for environmental protection of our society than exists at present. Perhaps the underlying philosophy should be one that recognizes the evolutionary nature of environmental legislation. At one level of analysis, our society exists because conflict can be resolved by agreement between disputants to submit to judicial decision. The judiciary requires an executive arm of governance to enforce its decisions, and a legislative arm to codify its decisions so that the same disputes will not constantly re-appear. Where, however, there are new forms of conflict and dispute (such as, in this case, dispute over the means of protecting the environment), society struggles because there is no body of law to turn to for guidance.

The usual resolution of this difficulty is to establish a separate judicial structure. In the U.S.A., for instance, there is the Environmental Protection Agency—*not* a Department of Environmental Protection. As we have seen earlier, Departments suffer from interdepartmental conflict, which can emasculate them. Thus, perhaps what is needed is a Standing Judicial Commission on Environmental Affairs, charged with creating, perhaps over a decade, a body of law on the environment that can guide development while protecting the environment in its widest sense. Such a standing commission should receive advice from departments already active in environmental matters, and in turn should advise the executive arm of the State on legislation arising from its consideration of environmental disputes, and possibly also the executive structure needed to enforce its decisions.

An advantage such a Commission would have over the existing structure is that it could be empowered to elicit evidence, so that, for instance, the problem that arises in the IEMP of there being no alternative use if there is no alternative user would be resolved. It would also be far better placed to weigh evidence, and thus resolve the conflict of I&AP's as identified in the previous discussion.

In sum, South African concerns about the environment are reflected in a fragmented approach to a whole new body of law. If we can establish the criteria by which development and environmental protection can co-exist, then we will have made a major contribution to the safe development of the sub-continent's vast resources. ♦