

THE ENVIRONMENT : WHOSE RESPONSIBILITY?*

It is rarely possible to identify and define the origins of events that have had a momentous influence on the history of mankind. Analysis usually reveals that a number of often unrelated events fortuitously culminate to give a particular result. It is more probably providence. The same is true with respect to the global environmental movement. The psychological mood that prevailed at the end of the second world war was reinforced by the Vietnam conflict and found expression in the hippy movement and protest art. "Where have all the flowers gone? When will they ever learn?" These emotional sentiments were subsequently supported by scientific evidence. Formal international attention to environmental issues was first given in 1987 in the report of the World Commission on Environment and Development¹⁴, commonly known as the Brundtland Commission after its chair, the then Norwegian Prime Minister, Mrs Gro Harlem Brundtland. In 1972, two important events occurred. The first was the publication⁷ of "The Limits to Growth" by the Club of Rome and the second was the Stockholm Declaration¹¹ that was adopted by the United Nations Conference on the Human Environment. It was twenty years before the next world summit, namely the United Nations Conference on Environment and Development (UNCED) was held from 3 - 14 June 1992 in Rio de Janeiro. During the interim of 2 decades, however, a great deal of work was done and a number of documents were published, for example The World Conservation Strategy and Caring for the Earth: A Strategy for Sustainable Living (IUCN, UNEP & WWF)¹⁵. Probably the most fundamental insight that was forthcoming during this period, is the concept of sustainable development as defined by the Food and Agriculture Organization (FAO) in 1989:

"Sustainable development is the management and conservation of the natural resource base, and the

orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations" as also expressed by David Gow³:

"This growing acceptance of the configuration of environment, poverty and sustainability is an important watershed in development thinking. Although it poses a formidable challenge to those who worry about the future of the planet, it also offers a golden opportunity for integrated, multidisciplinary solution(s) – an approach often honoured by little more than lip service in the past".

and summarised by Huntley et al.⁴:
"At the core of sustainable development lies economic growth, the state of the environment and the quality of human life".

Sustainable development has become the international environmental credo and is directed towards the optimal utilisation of production resources in order to: prolong the availability of non-renewable resources, establish an equilibrium between use and regeneration of renewable resources, and minimise pollution and environmental degradation.

In the universal context issues such as ozone depletion, global warming, deforestation and trade manipulation are of the greatest concern. Of these, global warming was the issue highlighted at the UNCED Conference and this led to the binding treaty "Framework Convention on Climate Change". Although we are not a signatory of the convention, the Department of Environment Affairs has convened a committee that must develop a policy and strategy on this issue for South Africa.

Having briefly sketched the international events that have led to the dogma of sustainable development, I now wish to turn to some of the prominent and critical environmental issues of today, particularly as they manifest in South Africa. They are:

1. The human dimension
2. Environmental economics
3. Pollution

4. Maintenance of biodiversity and
5. Physical and spatial planning

The human dimension

Unless we address environmental issues in terms of human well-being, we neither understand our calling nor has our custody of creation any meaning.

The widening chasm between poverty and affluence was the overriding theme that prevailed at the UNCED conference in Rio de Janeiro. It is estimated that approximately 20% of the world population live in the developed northern hemisphere, but consume 80% of the earth's total resources. Conversely, it is also true that unlimited population growth in the underdeveloped countries will eventually outstrip the total carrying capacity of the earth. This is true also in South Africa. Statistics by (Neville Gouws of the Department of National Health and Population Development, personal communication) reveal inter alia the following trends:

In South Africa (including the TBVC countries) in 1902, only 90 years ago, our population was 5 million. Since then the time required to add every additional 5 million has become shorter and shorter: 36 years, 20 years, 9 years, 7,5 years, 6,1 years, 5,9 years and presently 5,1 years. The total population will grow from the approximate 39 million to 70 million over the next 50 years if the Population Development Programme is successful, or to 94 million if it is not. The consequences of the latter possibility will be catastrophic since South Africa can only accommodate 80 million people.

In his opening speech on June 3, the UNCED Secretary-General, Maurice Strong, told delegates:

"We have been the most successful species ever. We are now a species out of control. Our very success is leading us into a dangerous future The wasteful and destructive life styles of the rich cannot be maintained at the cost of the lives and livelihood of the poor, and of nature. No place on the planet can remain an island of affluence in a sea of suffering".

Similar sentiments have been

* Sir Arnold Theiler Memorial Lecture 1992

Table 1: **South African total waste stream in 1991 (t yr⁻¹)**

	million tonnes
mining waste	330
coal ash	29
urban waste (1986)	15
agricultural waste (1989)	20
sewage sludge (1983)	12
non-metallurgical industry waste	6,8
metallurgical industry waste	5,5

expressed by Stedman and Hill⁹:

“Whatever your cause, it is a lost cause without population planning”.

The only solution to the above-mentioned situation lies in education, because only an informed and enlightened person is able to take responsible decisions with respect to family planning, a sentiment emphasised by Chief Minister Buthelezi at the opening of the Nurserymen's Congress²:

“Whilst parents should maintain the right to decide on the size of their family in accordance with their means, the IFP upholds the belief that the firm foundation of any family rests on the balance between family size and the resources that are available to that society.”

Education in general and environmental education in particular is imperative. It must, however, not only be aimed at generating awareness, but it must be intent on establishing understanding and insight.

A heartening positive facet of the environmental scene, is the enormous public awareness and participation which currently exists. In South Africa alone, there are some 1 000 active private organisations, and some 2 000 non-government organisations attended the Global Forum which was organized in parallel to the Earth Summit in Rio de Janeiro.

The collective concern, if directed in a responsible way, may eventually prove to be the most valuable vehicle for conveying environmental messages and generating a common commitment at grass roots level.

Environmental economics

Fundamentally, environmental issues are intertwined with the economy. Man needs to use renewable and non-renewable natural resources to survive. In this process, the basis of all economic activity that leads to prosperity is eroded, while at the same time the waste products of industrial enterprise lead to pollution. Certainly,

improved technology must be used to optimise resource utilisation as well as to contain pollution, but economic policies will ultimately determine the future of our environment. For example, the maize price has a very specific influence on the utilisation of different geographic areas for production. This in turn leads to over-fertilisation, soil erosion, water pollution and silting.

The interrelationship between economic and fiscal policies and environmental consequences are however, generally, far more complex than the above-mentioned example illustrates and this is the subject of intellectual study and assessment world wide.

A fundamental concept regarding environmental economics is the principle of internalisation of external environmental costs. In other words, the cost of industrial production must include the degree of resource consumption (both renewable and non-renewable) as well as consequential environmental degradation in terms of the loss of national assets. This is an extremely complex matter, but one that has to be pursued in order to develop a formula that will describe the equilibrium between conservation and production.

A further economic aspect relates to the pricing of commodities in international trade. The manipulation of the general agreement on trade and tariffs (GATT) to achieve environmental objectives is a topic of international dispute between the first and third world countries.

Apart from the above-mentioned general considerations, the specific facet of global warming, CO₂ emissions, energy generation and the eventual exhaustion of fossil fuels is probably the most pressing universal environmental issue.

Pollution

From a scientific and also from the public's point of view, pollution of the

air, water, and soil, enjoys prominence - and with good reason. Table 1 and 2 give some insight into the magnitude of the problem in South Africa¹.

Mining waste includes 45 million tonnes discard coal and overburden from open-cast coal mining, 190 million tonnes gold mine tailings, 36 million tonnes platinum-group metal mine tailings and slags, 20 million tonnes phosphate mine tailings, 60 million tonnes base metal overburden and tailings, and 23 million tonnes diamond mine overburden.

South Africa is, however, not alone in the world in this respect. In a draft State of the Environment Report, February 1992 (Chapter 24) by the Executive Director of UNEP, 6 of the 10 major environmental issues that are addressed have to do directly with pollution. He comments:

“These issues arise from human actions, and are of concern principally because their effects impinge on human well-being, either directly or by undermining the life-support systems of the environment. Usually these are matters of scale, arising because resource demands or pollutant discharges exceed the capacity of the biosphere. Human actions to meet human needs have breached the limits of the ‘carrying capacity’ of the physical environment. These limits have been exceeded in most parts of the world.”

These are disturbing words. Only by committed co-operation and cohesion is there any prospect of successfully redressing the problem.

The Department of Environment Affairs commissioned an exhaustive report on pollution control and waste management. It was completed by the CSIR at the end of 1991 and it is currently being analysed and assessed. It is envisaged that its recommendations will lead to the declaration of formal policy and the promulgation of appropriate legislation. As a specialised sequel to the above report, the CSIR has finalised a report on toxic waste for the Department of Environment Affairs. It is anticipated that this report will provide the foundation for the responsible co-ordinated management of toxic substances in South Africa. The problem of littering and the prospect of recycling must also be addressed in any policy that is intent on abating pollution.

Apart from the above reports, a wide variety of research projects are under way that are all designed to

provide scientific information and generate recommendations pertaining to the management and protection of the environment, be it river management, air pollution, marine resource management or meteorological data. We must nevertheless guard against what has been termed "voluminous compendiums of largely irrelevant and underutilized data"³.

Although our database is neither complete nor comprehensive, we already have a great deal of valuable facts which, if used properly, can provide us with adequate information from which we can develop policy and design strategies.

Maintenance of biodiversity

Nature conservation in general and the protection of game in particular are 2 areas in which South Africa has excelled and of which it can be justly proud. The same applies to the successful scientific management of our marine resources. However, the time has now arrived when we need to view the protection of our fauna and flora in a more holistic and fundamental way - namely the conservation of biodiversity.

Biodiversity is defined in the Convention on Biologic Diversity as follows (Article 2)¹²:

"Biologic diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems".

The significance of biodiversity is well described in the introduction to the "Global Biodiversity Strategy"¹⁶:

"In the remote past, human actions were trivial when set against the dominant processes of nature. No longer. The human species now influences the fundamental processes of the planet. Ozone depletion, worldwide pollution, and climate change are testimonies to our power.

Economic development is essential if the millions of people who live in poverty and endure hunger and hopelessness are to achieve a quality of life commensurate with the most basic of human rights. Economic progress is urgent if we are not only to meet the needs of the people alive today, but also to give hope to the billions born into the world over the next century."

The conservation of biodiversity is fundamental to the success of the development process. It is not just a

matter of protecting wildlife in natural reserves. It is also about safeguarding the natural systems of the Earth that are our life-support systems and the genetic richness on which we depend in the ceaseless struggle to improve our crops and livestock."

Elsewhere in the Strategy it is stated that:

The South African situation has been summarised in the CSIR report to UNCED¹⁰:

"Southern Africa has a great diversity of plant and animal communities, reflecting the wide range of environmental conditions in the region. The region is particularly rich in plant species.

The fynbos biome has by far the richest flora, in both absolute and relative numbers. The savanna has the highest species richness of terrestrial vertebrate animals.

One of the most outstanding features of the biodiversity of South Africa is the richness of plant species in the fynbos biome. Some 8 504 species of flowering plants and gymnosperms and about 75 species of ferns and non-flowering vascular plants occur in the fynbos biome. They make up 45% of the plant species found in southern Africa. The fynbos also boasts a high degree of endemism: nearly 70% of species and 20% of plant genera are endemic."

One of the most important reasons for maintaining biodiversity is to ensure that the gene pool for plants and livestock for food production is conserved. Major agricultural catastrophes have occurred due to the international trend towards the use of monocultures for production purposes. This matter is dealt with comprehensively in the World Conservation Strategy, a collaborative publication by the IUCN, UNEP, WWF, FAO and UNESCO⁵.

In South Africa the efforts of the Department of Environment Affairs are currently focused on the development of a National Conservation Plan. What we ultimately must aim for is to place 100% of the country under some form of conservation. This does not mean that we should aim at maintaining a pristine environment at the cost of development. The key is to establish a gradation of levels of protection so that the urban environment can also be included. In this regard, the protection of the cultural man-made heritage is as important as nature.

Physical and spatial planning

The long term outcome of a country's environmental fate is determined by where and how physical development is allowed to take place. This includes the location of cities, mines, roads, irrigation schemes, power generation and the recreational facilities. Much of this is however predetermined by the geographical features such as natural harbours, rivers, mineral deposits and arable land. Notwithstanding these, judicious planning can ameliorate the environmental impact of such developments. In the past, environmental consequences have often been ignored during planning phases. Fortunately a new awareness is now evident.

Techniques whereby environmental consequences could be predetermined were unfortunately not generally available in the past. However, recently there have been quite marked developments in this regard. South Africa is one of the countries where the principle of integrated environmental management is being employed, and the analytical method of Environmental Impact Assessment is applied.

There are 2 important areas where correct planning are of the greatest importance. The one is the ecological sensitive coastal zone and the other is informal urbanisation. Failure to manage these 2 elements, will have destructive consequence and therefore demand particular attention. We must never forget that for many people the environment is very local and personal in as much as it affects the quality of their daily lives often under dismal circumstances. Failure to appreciate this dimension will leave us out of touch with reality and relegated to irrelevance.

Noudat die wêreldagtergrond geskets en die hoof probleemterreine aangetoon is, ontstaan die vraag: Wat moet hieromtrent gedoen word? Hoe moet dit gedoen word en wie moet dit doen? Die kompleksiteit van omgewingsaangeleenthede kan maklik enige poging tot aksie lam lê. Na afloop van 'n konferensie in Assisi⁸ is die volgende geformuleer:

"The environmental problem is so complex and its various components are so intricately intertwined that its successful solution requires the common coordinated effort of everyone."

Verskeie skrywers, onder andere Huntley, et al⁴ het voorts die noodsaaklikheid van 'n holistiese

Table 2: Air emissions on the eastern Transvaal highveld in 1987

Source	Emission (tonnes per year)					
	Particulates	SO ₂	NO _x	Hydrocarbons	CO	CO ₂
Power stations	355 843	1 110 585	371 791	363	43 538	135,4 x 10 ⁶
Brickworks	not known	2 634	142	362	11 487	0,582 x 10 ⁶
Ferro-alloy works	27 713	1 557	small	small	small	0,463 x 10 ⁶
Steel	12 582	78	not known	small	small	not known
Sawmills	2 110	499	604	907	5 337	0,325 x 10 ⁶
Paper, pulpmills	44	79	small	not known	11 430	not known
Petrochemical	433	7 019	not known	245 527	small	not known
Domestic	19 465	36 984	2 919	19 465	87 593	4,863 x 10 ⁶
Coal dumps	small	54 390	not known	not known	not known	not known
Motor vehicles	4 466	small	28 464	47 277	212 503	not known
Other	4 608	3 903	3 091	small	small	0,370 x 10 ⁶
TOTAL	427 264	1 217 728	407 011	313 852	371 888	142 x 10⁶
Variance since 1984	+14%	+17%	+15%	+14%	+10%	+15%

benadering tot omgewingsproblematiek beklemtoon:

"It is dear that the protection and containment of the environment is a task of major dimensions; that it requires a holistic approach and a common commitment. A strong environmental ethic and individual accountability are imperatives".

Hierdie beginsel is ook in 'n onlangse publikasie "Beyond the Limits"⁶ uitgelig:

"The Sustainability Revolution, if it happens, will be organic and evolutionary. It will arise from the visions, insights, experiments, and actions of billions of people. The burden of making it happen is not on the shoulders of any one person or group. No identifiable person or group will get the credit, though some may get some blame. And everyone can contribute."

Die Departement van Omgewingsake as sentrale owerheidsliggaam het bepaalde funksies en verantwoordelikhede, naamlik:

- die ontwikkeling van nasionale beleid en 'n omgewingstrategie;
- die vestiging van 'n gepaste omgewingswet raamwerk;
- monitering van die stand van die omgewing;
- bevordering van koördinerings;
- fasilitering van privaat inisiatief;
- leidinggewing en ondersteuning van navorsing;
- die handhawing van internasionale samewerking.

Die Owerheid behoort dus 'n rigtinggewende pro-aktiewe en

koördinerende rol te speel, maar beskik nóg oor die begeerte, nóg die vermoë om omgewingsaangeleenthede alleen aan te pak. Direkte noue samewerking binne die owerheidsektor insluitende semistaatsinstellings, akademiese instellings, asook die nywerhede is noodsaaklik. In hierdie opsig is die rol van besorgde individue van die grootste belang. Ons sal moet staatmaak op die visie van leiers; die navorsing van wetenskaplikes; die verantwoordelikheid van nyweraars; die sensitiwiteit van ontwikkelaars, die entoesiasme van kinders en bowenal individuele toewyding om die omgewing vir die toekoms van ons land te bewaar.

Om hierdie begrip te vestig en om uitvoering daaraan te verleen, is die volgende strewe in die Witskrif op 'n Nasionale Omgewingsbestuurstelsel vir Suid-Afrika¹³ geformuleer:

"Alle suksesvolle demokratiese samelewings berus op die veronderstelling dat elke individu 'n persoonlike verantwoordelikheid vir sy eie welvaart en welsyn asook teenoor sy landgenote dra. Die Regering onderskryf hierdie uitgangspunt en onderneem om voorligtings- en opleidingsprogramme te ontwikkel, sodat elke individu in staat sal wees om sy persoonlike verantwoordelikheid ten opsigte van die omgewing op 'n ingeligte wyse na te kom. Nie net individue nie, maar ook mense in kollektiewe verband het 'n verantwoordelikheid om na omgewingsaangeleenthede binne hulle belangesefer om te sien. Daarom

verwag die Regering dat onder andere georganiseerde landbou-, handels- en nywerheidsorganisasies, vakbonde en politieke liggame, beroeps- en professionele verenigings, die openbare media, mynhuise, kunstenaars en joernaliste elk op hulle besondere terreine, asook kulturele en geografiese gemeenskappe, konkrete inisiatiewe sal neem om, in samewerking met die owerheid, aan omgewingsaangeleenthede aandag te gee en dit te bevorder. Op hierdie wyse sal demokratisering van omgewingsake en die deelname van betrokkenes bevorder word."

Dit is dus van belang dat die veteriniere professie hom ook oor hierdie saak vergewis. Dit behoort egter, danksy veeartse se opleiding en hulle gewone werk, nie moeilik te wees nie. As illustrasie hiervan wil ek 'n parallel trek tussen die 5 omgewingselemente wat deur die Internasionale Unie vir die Bewaring van die Natuur (IUCN) onderskei is en Sir Arnold Theiler se baanbrekerswerk met betrekking tot die ontrafeling van die lamsiekte probleem.

Die IUCN onderskei die volgende 5 verwante komponente vir volgehoue ontwikkeling:

- 'n *Ekonomiese dimensie* wat met die skepping van rykdom, verbeterde lewensomstandighede en 'n geskikte balans tussen koste en voordele te make het.
- 'n *Maatskaplike* komponent wat betrekking het op die welsyn van die gemeenskap en die individu,

ten opsigte van voeding, gesondheid, onderwys en behuising.

- 'n *Politieke dimensie*, waarby waardes soos menseregte, selfbeskikking, sekuriteit en openbare deelname inbegrepe is.
- 'n *Kulturele dimensie* wat die eiesoortige en eie waarde van gemeenskappe erken.
- 'n *Ekologiese* komponent wat die primêre belangrikheid erken van bewaring van natuurlike hulpbronne en -prosesse waarvan alle vooruitgang afhanklik is.

Ons vind al hierdie elemente in die lamsiekte sage terug. Vanweë swak produksie en veevrektes, is 'n hele gemeenskap se welsyn en selfs voortbestaan in gevaar gestel. Sonder die politieke wil om die nodige geld, mannekrag en fasiliteite beskikbaar te stel, sou die probleem nie opgelos kon word nie. Dit het wetenskaplike kennis, analitiese denke en persoonlike toewyding geveer om die komplekse ekologiese prosesse te ontrafel en op gepaste wyse die natuurlike balans tussen grond, plant en dier weer te herstel.

Insgelyks het veeartse reeds ten aansien van die volgende terreine hulle merk gemaak:

- Die toepassing van epidemiologiese beginsels van populasie dinamika in die bekamping van infeksiesiektes
- Die suksesvolle teling van bedreigde spesies in gevangenskap
- Die verantwoordelike gebruik van farmaseutiese en toksiese middels, asook insekdoders

Advies oor weidingstelsels wat veral daarop gemik is om natuurlike balans tussen plantsoorte te handhaaf en die indringing van vreemde en giftige plante teë te werk.

Ten slotte moet ek u egter daarop wys dat alle omgewingsaangeleenthede en probleme nie in isolasie afspeel nie. Hieroor moet ons geen illusies hê nie. Megatendense en gebeurtenisse gaan ook bepalend wees of ons hoegenaamd ons omgewingsdoelwitte gaan bereik al dan nie. Hulle is onder

andere die volgende:

1. Die bereiking van politieke akkoord
2. Die handhawing van wet en orde
3. Die vestiging van 'n balans tussen bevolkingsgroei en hulpbronne
4. 'n Fundamentele herstrukturering van ons maatskaplike struktuur gebaseer op meriete, prestasies en veral produktiwiteit en
5. Gepaste onderwys en opleiding wat almal in staat moet stel om deur tegnologiese vaardigheid ekonomiese herstel te bewerkstellig.

As ons hierin faal, is ons almal saam gedoem tot werkloosheid, armoede, honger en ellende:

- politieke stabiliteit moet mense in staat stel om verantwoordelikheid vir hulle eie toekoms te neem
- wet en orde moet die sekuriteit verleen om beleggings te lok
- volgehoue benutting en produksie moet die doel van landbou en industriële ondernemings wees
- maatskaplike herstrukturering en gelyke geleentheid moet vir mense die hoop op 'n beter toekoms bring
- ekonomiese groei moet die finansiële middele en tegniese vermoëns voorsien om omgewings-agteruitgang te stuit en beskaafde standaarde te handhaaf.

Die owerheid kan nie alleen alles beredder of vermag nie. Ons sal individueel en gesamentlik, onder andere deur die getroue beoefening van ons beroepe en die vervulling van ons roeping, moet meehelp om 'n nasionale omgewingsetiek en -trots te ontwikkel.

Die leuse van die wêreldomgewingsdag dien as waarskuwing: Ons het net een Suid-Afrika en net een kans.

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