SOME ENVIRONMENTAL CONCERNS IN CITY DEVELOPMENT

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Die snelle tempo van verstedeliking en die agteruitgang van die omgewing op vele terreine verg effektiewe wetgewing wat ten doel het om die onderhoud en skepping van 'n hoë kwaliteit omgewing, beide die beboude en bio-fisiese, te bevorder. Die werkinge van die omgewing word vandag beter verstaan en daar is 'n etiek en toewyding vir omgewingsbeskerming in die geledere van stads- en streekbeplanners aan die groei.

Die opdrag om die omgewing te beskerm kom net in een artikel in die Ordonnansie op Grondgebruikbeplanning voor, maar dit word verder in die 'Handleiding vir struktuurbeplanning' toegelig. In wese is daar min verskil met die ou Dorpeordonnansie. Suksesvolle omgewingsbeskerming lê dus nie in die wetgewing self nie, maar in die wyse waarop dit toegepas word. Daar is ongelukkig 'n mate van oorvleueling in die verantwoordelikhede van verskillende staatsdepartemente in dié verband.

Daar moet onderskeid gemaak word tussen die verouderde begrip van 'preservering' teenoor die dinamiese begrip 'bewaring'. Preservering probeer die mens uit die natuur hou, terwyl bewaring konstruktiewe simbiose tussen die mens en sy omgewing nastreef. In die toepassing van die Ordonnansie moet daar nie net na tweedimensionele ruimtelike ordening gekyk word nie, maar na plekskepping wat die interafhanklikheid van die mens en sy omgewing sal integreer.

Omgewingimpakstudies is noodsaaklik as onderdeel van die beplanningsproses, maar dit moet nie deur wetgewing verplig word nie, want dan sal die studies 'n doel op sigself word. Persone van relevante dissiplines, veral bio-fisici, ontwerpers en holiste, moet deel wees van die beplanningspan (van die begin van die beplanningsproses af), maar stadsbeplanners, wat die volle omvang van dié proses ken, moet die leiding neem.

Die owerhede verantwoordelik vir die opstel en goedkeuring van struktuurplanne behoort meer duidelikheid te gee oor die verwagtinge vir die omgewing uit dié planne. Daar moet egter gewaak word teen lang merklyste, soos dié aangegee in die 'Handleiding', want dit lei tot oormatige beskrywende beplanningsverslae wat geen nut (utiliteit) het nie. Van meer belang is die beplanningsproses waardeur funksionele norme opgestel word waarteen die huidige omgewing en verwagte impak gemeet kan word.

INTRODUCTION

Fifty one years separate the Land Use Planning Ordinance (15/1985) (LUPO) from its predecessor, the Townships Ordinance (33/1934). During this half century population growth and urbanization have taken place at a quickening pace throughout the country.

The national population has more than trebled in this time and, with the current growth rate of 2,3%, it will double in another 28 years. The urban population has more than quadrupled during that time. Similar factors of increase have been experienced in the Cape Province and among its major metropoles.

This process of rapid population growth and urbanization is a repetition of the processes experienced world-wide, particularly during this century: cities have been multiplying in number and expanding in size individually. This has had profound effects on the natural/biophysical systems to which all cities are tied, and, in turn, upon the quality of life within urban agglomerations: significant deterioration in the condition of the biophysical environment has been underway particularly in the post-war era. The precise nature and extent of deterioration vary with context but general patterns are clear and their outlines are increasingly visible in urbanising South Africa.

Indiscriminate outward-sprawling low-density suburban development, fueled by the detached house and assumed high levels of private mobility, is causing exponential loss of high quality farmland thereby undermining the food and fibre-producing capacity of metropolitan regions. A variety of industrial and domestic solid, liquid, and gaseous wastes, including vehicle emissions, are stressing the absorptive and recycling capacities of air and water systems, leading to serious pollution problems with associated breakdowns in public health and partial or total collapse of terrestrial and aquatic ecosystems. The construction of large scale infrastructural systems – freeways, water projects, power stations and powerlines – together with insensitively located urban developments, is scarring the landscape causing serious scenic and aesthetic deterioration.

Simultaneously, however, knowledge of the workings, tolerances, and significances of the biophysical environment has been broadening and deepening. Also, within the field of city and regional planning there has been a revival of a land ethic and the emergence of, and commitment to, an explicit 'design with nature' philosophy.

All of this constitutes part of the backdrop against which the new Ordinance and the associated *Manual for Structure Planning* (MSP) (CPA 1986) have been formulated and it should have influenced their content. The ultimate objective of the new legislation is not greater administrative efficiency. Legislation is but a means to an end. The ultimate objective

should be that of facilitating the maintenance and creation of high quality built and biophysical environments as effective settings for human living. This is the criterion by which the efficacy of the new legislation must ultimately be judged.

More specifically, given the foregoing discussion, at least two expectations may be associated with such legislation:

- it should provide an effective mechanism for regulating the release of land and guiding its use;
- it should establish clearly, by means of argument and example, the scope and level of excellence expected of the planning applications that are to pass through this mechanism.

The purpose of this paper is two-fold: to inquire into the role accorded by the LUPO and MSP to the biophysical environment in the process of city development; and second, to discuss a number of concerns arising from this inquiry.

THE LUPO AND MSP: STRUCTURE PLANS: THE BIOPHYSICAL ENVIRONMENT

Figure 1 sets out key statements relating to the biophysical environment drawn from: the Townships Ordinance; Land Use Planning Ordinance; MSP (CPA 1986); Physical Planning Act (88/1967); and the Environment Conservation Act (100/1982).

Two points should be noted about Figure 1: First, section 4(9) of the LUPO, referring to the preservation of the natural and developed environments, is the only explicit reference anywhere in that ordinance to the content of structure plans. It is not made clear why this particular aspect has been singled out for special attention. It may be due to concern about the processes of environmental deterioration referred to earlier, and/or to the overlapping and pre-existing responsibilities and commitments set down in the Physical Planning and Environment Conservation Acts, respectively, regarding nature areas. (Note: this paper is dealing only with the natural/biophysical environment.)

Second, the MSP has been designed as the counterpart of the LUPO, to act as a guide and reference for the execution of its dictates. The two documents therefore need to be considered jointly.

Bearing these two points in mind the most striking conclusion to emerge from scrutiny of Figure 1 is that, in spite of the passage of 50-odd years, there is little substantial difference in content between the later and the earlier legislation. Both make reference to land suitability analyses with the checklists in the MSP being slightly longer than those in the 1934 Ordinance. Both refer to preservation and reservation of components of the biophysical environment.

It is clear therefore that if city and regional planners are to contribute towards arresting deterioration of the biophysical environment and improving city-biophysical interactions then these conditions will not necessarily be promoted by the new legislation per se. There seems to be no good reason why, of itself, it should achieve more success than did the old legislation. Improved city-biophysical conditions are therefore going to be contingent upon the attitudes of planners to this relationship, the significance and role that they accord to biophysical processes in the process of structure plan formulation, and the manner in which they interpret and utilise the legislation to this end.

With a view of assisting planners in this regard the remainder of this paper is devoted to expanding on three interrelated environmental concerns that are central to the process of city and regional development:

(a) preservation or conservation;
(b) spatial order and place-making;
(c) environmental quality.

ENVIRONMENTAL CONCERNS IN CITY DEVELOPMENT

Preservation or Conservation

Environmental preservation is not a concept much favoured today and it has been superseded by the more dynamic concept of environmental conservation. Preservation for too long carried the connotation of an anti-human and static approach to nature and it has little to offer in an era of rapid and large scale population growth. The exponentially expanding extractive and waste-absorbing stresses that such a context inevitably directs at the environment demand a different approach from environmental managers.

Conservation recognises the inseparability of people and nature and therefore does not seek a solution to the problem primarily through separation. Instead, it embraces the human presence and actively seeks to promote a positive partnership between people and their biophysical environment. Moreover, being a dynamic concept, it deals not only with the present but also looks backward to the past and forward to the future, and engages in three types of interventive activity: restoration (past), utilization (present), and preparation (future).

Restoration is directed at the inherited legacy of mismanaged environments for example deforested slopes, eroded landscapes, polluted and stressed air, water, and biological systems, and at implementing programmes for stabilising such conditions and, where appropriate, returning them to productive uses. **Utilization** refers to guidance and control of the variety of extractive and waste-generating activities that serve current societal demands with the emphasis properly being placed on the multi-purpose use of renewable natural resources. **Preparation** is geared to the future, to getting ahead of the challenges of exponential and diversifying demands, identifying the sensitivities, limitations, and robustnesses of different parts of the landscape, formulating policies for appropriate usage, and implementing programmes of land preparation and related management controls – afforestation, clearing, terracing, reserving and purchasing.

The overarching concept within which these actions should be conducted is that of environmental balance. Balance defined in this context is not a static concept but a condition of continuous and mutual adjustment of human behaviour and environmental transformation along a trajectory leading to qualitative improvements

FIGURE 1: KEY STATEMENTS RELATING TO THE BIO-PHYSICAL ENVIRONMENT

ENVIRONMENT CONSERVATION ACT (100/1982)

Sect. 2 There is hereby established a council under the name the Council for the Environment.

Sect. 4 The objects of the council shall be to advise the Minister on the co-ordination of all actions directed at or liable to have an influence on any matter affecting the conservation and utilization of the environment, ...

Sect. 9(1) The Minister may in respect of any nature area establish a management committee, to advise him on the management and development of such nature area.

Sect. 10(1) The Minister may by notice in the Gazette issue directions with regard to the management and development of land situated within any nature area.

Sect. 1(viii) 'nature area' means any area reserved as a nature area in terms of section 4 of the Physical Planning Act (Act No. 88 of 1967);

PHYSICAL PLANNING ACT (88/1967)

Sect. 4(1) The Minister may after consultation with the Minister of Agriculture and Fisheries, the Minister of Mineral and Energy affairs and the Minister of Water Affairs, Forestry and Environmental Conservation and the Administrator of the province concerned by notice in the Gazette reserve (any) the land (specified) defined in such notice –

(a) for the utilization of a specific natural resource or

(b) as a nature area.

'natural resource' means any raw material obtained from nature and includes soil, air, water and minerals;

'nature area' means any area which could be utilized in the interest of and for the benefit and enjoyment of the public in general and for the reproduction, protection or preservation of wild animal life, wild vegetation or objects of geological, ethnological, historical or other scientific interest;

CAPE PROVINCE TOWNSHIPS ORDINANCE (33/1934)

Sect. 3 It shall be the duty of the Board (Townships Board) ...

(b) in connection with any such application to consider and make recommendations in respect of any or all of the following matters:

(ii) the suitability of the site with regard to position, water supply, soil, aspect, slope, climate conditions, and to any other physical features, conditions or circumstances which may affect the proposal to establish a township or subdivide an estate on the proposed site, including the necessity for the provision of retaining walls for the support and protection of roads.

SECOND SCHEDULE MATTERS TO BE CONSIDERED IN THE PREPARATION OF THE SCHEME

2 The reservation of land for afforestation purposes, recreation grounds, parks and other open spaces, including playing grounds for children.

4 The preservation of places of natural beauty and of local or national historical interest.

5 The reservation of areas to be used solely for agricultural purposes.

LAND USE PLANNING ORDINANCE (15/1985)

Sect. 5(1) The general purpose of a structure plan shall be to lay down guidelines for the future spatial development of the area to which it relates (including urban renewal, urban design or the preparation of development plans) in such a way as will most effectively promote the order of the area as well as the general welfare of the community concerned.

Sect. 4(9) In the preparation, amendment, withdrawal or reviewing of a structure plan in terms of this section regard shall be had to the preservation of the natural and developed environment and steps taken in this connection shall be specified.

MANUAL FOR STRUCTURE PLANNING, (CPA 1986)

ANNEXURE A:
TYPICAL SUB-REGIONAL STRUCTURE PLAN REPORT CONTENTS

3 The Sub-Regional Area
3.3 Physical and Natural Characteristics
3.3.1 Topography
3.3.2 Environmental Elements
3.3.3 Climate
3.3.4 Vegetation
3.3.5 General Geology
4 Future Spatial Development Patterns
4.3 Agriculture
4.4 Forestry
4.5 Future Areas

ANNEXURE B:
TYPICAL URBAN STRUCTURE PLAN CONTENTS

2 Analysis of the Suitability of the Land
2.1 Ecological survey
2.1.1 Analysis of the natural environment
2.1.1.1 Meteorology
2.1.1.2 Geology
2.1.1.3 Soils
2.1.1.4 Topography
2.1.1.5 Hydrology
2.1.1.6 Flora and fauna
2.1.2 Analysis of the built environment
2.1.2.1 Land use
2.1.2.2 Land ownership
2.1.2.3 Public utility services
2.2 Interpretation and evaluation of the bio-physical information
2.3 Constraints to the proposed development
2.4 Problems and opportunities

3 Natural Characteristics
3.1 Location and size
3.2 Geology and soils
3.3 Physiography
3.4 Climate

9 Conservation
9.0 Conservation of the Natural and Developed Environment

ANNEXURE C:
TYPICAL LOCAL STRUCTURE PLAN CONTENTS

5 Land Use Suitability Analysis
5.1 Methodology
5.2 Ecological inventory
5.2.1 Natural environment analysis
5.2.2 Developed environment analysis
5.3 Interpretation and evaluation of the bio-physical information
5.4 Constraints to the proposed development
5.5 Problems and opportunities

in conditions of living. The objective of conservation is therefore to contribute to enabling the landscape to sustain life as a whole (plants, animals, and people) in richer and more varied forms. Part of this objective requires that areas be set aside for predominantly plant and animal communities to grant them the right to exist and to reproduce themselves with limited human disturbance. These primeval/ wilderness areas together with the rural countryside and the city constitute the three major realms of life and their continued existence demands that their distinctive roles be actively promoted (Mumford, 1944 Ch.5).

The reference in section 4(9) of LUPO to environmental preservation requires reconsideration in this light. Narrowly interpreted, it could be taken to imply that with the designation of nature or preservation areas planners have discharged their responsibilities to the environment which need thereafter exert little influence on structure plan formulation. This is not the case, any more than conservationists should regard the world beyond nature area boundaries as of no further consequence to their efforts. The total environment – urban, rural, and primeval – cannot be chopped up into artificial fragments and then successfully planned and managed in isolation one fragment from another. From the planning perspective the biophysical environment pervades all scales of structure planning, as indeed Annexures A to C of MSP, (see Figure 1) suggest, while the city as a physical artifact and the demands of its residents affect the biophysical constituents of the three environmental realms – urban, rural and primeval. It is clear, therefore, that not only are the three environmental realms linked through the varied demands of people upon them, so too, by extension, are the different disciplines and professions who specialise in managing one or more of these realms. In spite of this, the current system of legislation actually compounds the fragmentation of management efforts.

As regards nature areas in particular, their designation resides with the Minister of Constitutional Development and Planning in terms of the Physical Planning Act. Their management resides with the Minister of Environment Affairs in terms of the Environment Conservation Act (see Figure 1). It is highly doubtful whether spatial planners alone have the necessary skills and insights required to designate nature areas. This means, therefore, that the services of biophysical specialists and holists are indispensable during (and not after) the process of structure plan formulation. The corollary of this is that those disciplines and organizations, like the Department of Environment Affairs, who are concerned with the conservation and management of the biophysi-

FIGURE 2: LEGISLATION GOVERNING COMPONENTS OF THE BIO-PHYSICAL ENVIRONMENT

BIOPHYSICAL COMPONENTS \ ACTS	Atmospheric Pollution Prevention Act 45, 1965	Conservation of Agricultural Resources Act 43, 1963	Dumping at Sea Control Act 73, 1980	Environment Conservation Act 100, 1982	Forest Act 72, 1968	Mines and Works Act 27, 1956	Mountain Catchment Areas Act 63, 1970	National Parks Act 57, 1976	National Monuments Act 28, 1969	Physical Planning Act 88, 1967	Sea Shore Act 21 1935	Seals and Sea Birds Act 44, 1973	Subdivision of Agricultural Land Act 70, 1970	Water Act 54, 1956
GEOLOGY : MINERALS								●	●	●●	●●			
ENERGY										●●				
PHENOMENA										●●				
SOILS		●					●			●			●	
PHYSIOGRAPHY : LANDFORMS					●	●		●						
HYDROLOGY : SURFACE WATER					●					●●				●●
GROUND WATER										●●				●●
CLIMATE : AIR QUALITY	●									●				
ECOLOGY : FLORA : TERRESTRIAL				●●	●		●	●●		●●				
AQUATIC			●	●●				●●		●●	●			
FAUNA : TERRESTRIAL				●●	●			●●		●●				
AQUATIC			●	●●				●●		●●		●		
PALAEONTOLOGY								●●	●●	●●				
ARCHAEOLOGY								●●	●●	●●				

cal environment, should be preparing statements and plans identifying those areas qualifying for specific strategies of restoration, utilization, and preparation.

Furthermore, in addition to the two acts already referred to there are at least twelve others, the responsibility of more than half-a-dozen different ministries, dealing with the rehabilitation, utilization, and protection of components of the biophysical environment. While Figure 2 suggests that each physical and biological component is potentially capable of being governed by one or more acts this set of acts has not been generated holistically and within the explicit dynamic conservation concept referred to earlier. This means that the possibility of executing such a concept is rendered correspondingly more difficult. The Environment Conservation Act, of which much was expected in this regard, does not amend or supersede any other acts and its emphasis appears to be predominantly on managing nature areas and controlling solid waste and noise pollution. Until such time as this situation is remedied the current set of acts governs conservation efforts and also affects the work of spatial planners. For this reason they need to be familiar with the general intent and content of these acts.

Spatial order and place-making

Structure plans are guidelines to the future spatial development of areas at varying scale. They establish the outlines of future urban areas and cities and are a means to the attainment of two related ends:

First, the promotion of the (spatial) order of an area; and second, of primary importance, the promotion of the welfare of the community concerned (section 5(1) LUPO).

The biophysical environment as the ever-present context of human settlement has a role to play in the attainment of these two objectives.

From a societal point of view it is a fact that the natural environment is neither homogeneous nor necessarily benign. It is richly patterned with a variety of resources that are essential for sustaining life, but it is also subject to episodic hazards that may render certain areas temporarily or permanently uninhabitable. In this sense, therefore, the environment has societal value and the geographic patterns of resources and hazards can be translated into equivalent geographic patterns of social value (Figure 3 contrasts the views of McHarg 1969:57 and Dauvellier 1977:18-28). The contribution of this to structure plan formulation is twofold: first, community welfare is advanced if urban development is so located as to minimize unnecessary resource losses and to avoid natural hazard areas; second, the task of evolving appropriate spatial order is assisted by the availability of spatially represented information on resource and hazard patterns, and, conversely, rendered more difficult by its absence.

The word 'order', as used here in relation to spatial planning, means: maintenance of appropriate physical relationships. It can be generated via one of two approaches: from 'below' through bringing biophysical processes and societal needs and processes into conjunction with one another in an interactive planning process, or from 'above' by superimposing some preconceived idea of order on site and citizenry. The first approach has been characterised as 'organic' and the second as 'geometric' and cities from the Stone Age to the present day have been planned according to one or other, or combinations, of these two approaches (Hilberseimer, 1955:115-161). In both cases a pattern or geometry of some sort, emerges on the land expressed in rhythms and hierarchies of various

FIGURE 3: THE SOCIAL VALUE OF THE BIO-PHYSICAL ENVIRONMENT

McHarg (1969:57)	**Dauvellier** (1977:18-28)
1 WORK PERFORMING PROCESSES Water storage and purification; topsoil accumulation; forest and wildlife inventory increase;	1 PRODUCTION ROLE Air and water; food and fibre; minerals and energy; light and heat.
Gaseous dispersal	2 CARRIER ROLE Waste absorption and recycling; stable surface for all human activity.
Flood, drought and erosion control, climatic amelio-ration	3 REGULATORY ROLE Physiographic regulation of wind and water erosion by vegetation cover. Climatic regulation of inflow and outflow of radiation; of CO_2 balance
2 PROTECTIVE PROCESSES Eg. flood plains and marshes	Biological regulation of pests and diseases.
3 UNIQUE/PRECIOUS RESOURCES Eg. historic, geological, ecological	4 INFORMATION ROLE Information about above three roles; about mechanical processes
4 VULNERABLE RESOURCES Eg. dunes, spawning and breeding grounds	
5 HOSTILE PROCESSES Eg. flood plains	

activities. It is important to note that the organic approach does not accord to the biophysical environment a predetermining influence on spatial order. The objective facts of nature require interpretation in a social context if they are to be of assistance to design.

The role of the biophysical environment in spatial planning extends well beyond its contributions to this two-dimensional order, beyond the lateral distribution of activities in the landscape. Spatial inventories of resources and hazards, and the pairing of these patterns via land use performance criteria to potential single and multiple uses, indeed give essential direction to a structural outline reflecting the inter-dependence of people and environment. But the interdependence of people and environment is more than simply structural: it is also sensory and psychological and these aspects must therefore play a role in settlement location and design.

The essential feature of the landscape is its extensiveness. This is broken up through the influence of relief/ landforms into 'places' of varying scale which then assume particular character through the addition of secondary elements: water, vegetation, and the sky (light, cloud form and motion, moods). Surface relief exerts the primary influence on place definition through the disposition of elements that centralise space (eg. isolated hills), direct it (eg. valleys), and define it (eg. escarpments). 'Places' so formed and then clothed by the secondary elements, are the fundamental constituents of landscapes and are the reference units of a variety of sensory and psychological experiences the chief of which are orientation and identification. Each place therefore projects its character or personality, possesses a spirit: the *genius loci* (Norberg-Schulz 1980).

The art of adding human settlements to this landscape of natural 'places' lies in interpreting and magnifying the *genius loci* and fulfilling the psychological needs of orientation and identification. Externally, this has implications for the siting and scale of settlement, the manner in which it is to be enclosed by or distinguished from the surrounding countryside or wilderness, and for its silhouette. Internally, the structure of solids and voids, the positioning of axes, and the use of specific materials, all require careful consideration (Norberg-Schulz, 1980:58-69).

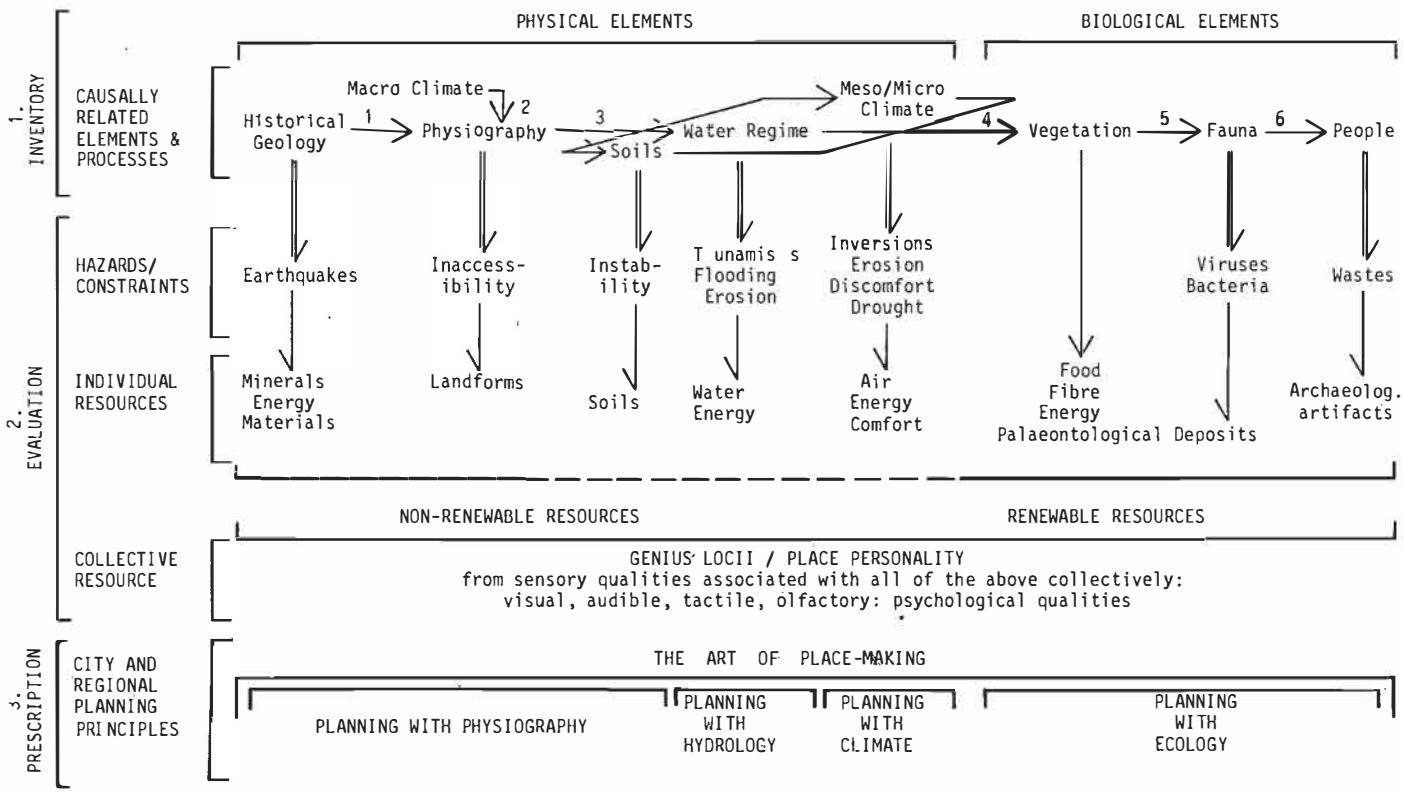
Place-making is therefore a process requiring a synthesis of the structural, sensory, and psychological qualities inherent in each particular context. The successful attainment of this unity between setting and settlement is both an art and a science and demands the co-ordinated contributions of the design disciplines during the stage of plan formulation.

Figure 4, which should be read as a matrix of rows and columns, outlines a procedure (inventory, evaluation, prescription) often used by spatial planners in designing with nature.

Environmental quality

From the foregoing discussion it is clear that a common objective, approached from different disciplinary

FIGURE 4: THE BIO-PHYSICAL ENVIRONMENT FROM A SPATIAL PLANNING PERSPECTIVE



stances, links the various environmental disciplines engaged in the management and conservation of the biophysical environment on the one hand, and the planning and design disciplines engaged in devising spatial order and in place-making on the other hand: the promotion of enduring high quality environments as viable settings for human living. In other words, intervention and the guidance of change are explicitly oriented towards improvement of the total environment. The consequences flowing from planning decisions and actions in particular, are always intended, therefore, to be positive. Yet many planning decisions have produced profoundly negative effects on the total environment as was indicated in the opening paragraphs of this paper. In addition to the values held by industrial societies (e.g. belief in unfettered growth, unconcern about residuals) part of the explanation for this situation lies in the steadily increasing bureaucratization of planning in recent decades. This has had the effect of elevating procedures, routines, and compliance with regulations and obsolescent town planning schemes to the status of ends, whereas in fact they should only ever be means to an end. For some time there has been an urgent need to rediscover and reaffirm the real objectives of planning activity.

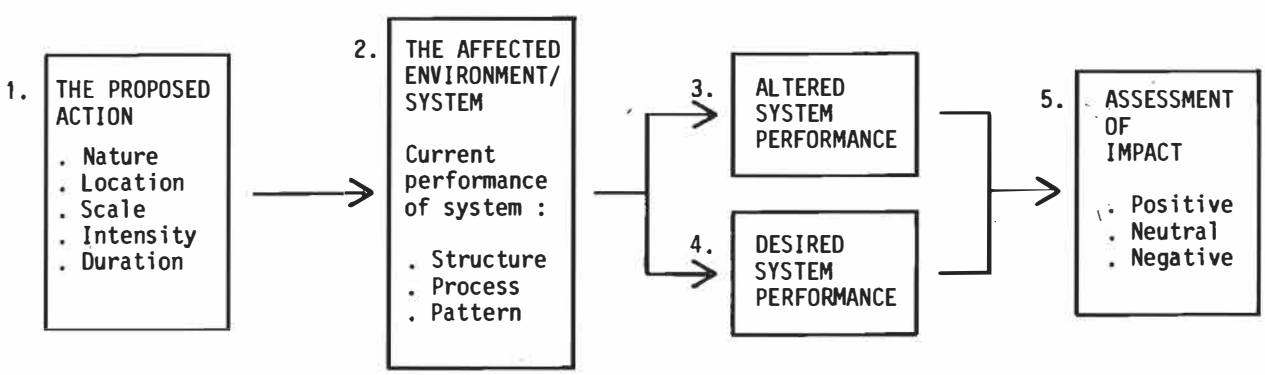
Concern about the consequences of planning decisions is not new and planning literature since the early 1960's has contained numerous references to ways of assessing the effects of various courses of action and ultimately refining the choice of the most appropriate alternative eg. planning balance sheet (PBS) and cost-benefit analysis (CBA) approaches (eg. Lichfield 1960 & 1970). The advent of environmental impact assessment (EIA) does not represent the introduction of a new concept but an extension of these earlier and still much-practiced approaches under a new name with a different acronym. The real difference with EIA is that it was made statutory in its country of origin, the USA, when President Carter signed into legislation the National Environmental Policy Act (NEPA) on 1/1/1970. A key section of the NEPA, section 102(2)(c), required that methods be developed for assessing the biophysical consequences of development proposals, and that reports on project proposals contained detailed descriptions of the proposed action and its impact. With the passage of time the scope of the term 'environment' has widened to include the social and related consequences of development, often the emphases in PBS and CBA, and the application of the concept has spread to many countries. In spite of the 16 years that have passed since NEPA EIA remains a fluid and confused field.

In the MSP passing reference is made to 'impact studies' of unspecified content or purpose (CPA 1986:21). Given the state of the art the following three points of clarification, from a city planning perspective, are offered.

First, the purpose of EIA, if it is to be more than merely a flat analysis of change, ought to be the improvement of environmental performance. Performance is the operative concept and unless it can be given content assessment criteria cannot be formulated and intervention will ultimately lack clear purpose. (Performance refers to the way in which, and the degree to which, the environment satisfies human or biophysical needs and demands.) The assessment of performance is a specialist (and political) task because the question being asked is: what ought the system, or the environment, at hand, to become? The question is explicitly normative. Obviously the assessment of performance, for example, of eco-systems and urban systems draws on the knowledge and skills of two different sets of specialists.

Once performance expectations have been established it is possible to assess the current environmental condition and identify any problems to be resolved; equally, it is possible to evaluate the probable consequences of any proposed intervention. Many studies purporting to be assessments of impact are in fact little more than descriptions of environmental change (i.e. steps 1-2-3, Figure 5) for the simple reason that desired system performance has not been specified: in the absence of performance criteria it is neither possible to assess the current condition of the environment nor to say whether probable induced changes will have positive, negative or neutral effects. From a planning perspective this would be inconsistent with the purpose of EIA and of little interventive utility. (See Figure 5.)

FIGURE 5: THE ESSENTIAL COMPONENTS OF ANY IMPACT ASSESSMENT PROCEDURE



Second, the techniques through which to undertake EIA are varied and continually evolving. Over the years five or six have emerged (ad hoc, checklists, matrices, overlays, networks). Their content and utility have been described and assessed by, among others, Clark (1978), Nichols and Hyman (1982), Shopley and Fuggle (1984). It is evident from the literature and from local experience that no one 'best' technique exists suited to the needs of all planning professions and capable of being used in all planning situations. Each particular combination of profession and problem generates its own requirements at the particular moment and leads to the evolution of new, innovative, and appropriate ways of integrating considerations of social and biophysical consequences into the overall planning process. A Delphi procedure for quantifying impact is sometimes used as an accessory to any of the above techniques. This procedure needs to be used with great caution and is not a short cut past the five steps indicated in Figure 5. (Entirely spurious results can emerge when panels of specialists are asked to attach numerical values to largely hypothetical impacts registered on scarcely understood systems for which no performance expectations have been generated.)

Third, the products of EIA, if planning is being undertaken correctly, are inseparable from the normal planning report. In other words EIA does not have a life of its own: it derives its purpose, content, and vitality from a position within a specific professional context. Nor is it like the tail that wags the dog: it does not override the planning process but is an essential and normal part of it. Furthermore, success in undertaking EIA resides not in a knowledge of techniques but quite fundamentally in professional competence: an understanding of, insight into, experience with the particular field that is of central concern to each planning and design discipline, and a dedication to the enhancement of social and biophysical wellbeing. By definition, therefore, EIA in the planning and design fields can only be undertaken by those steeped in the subject matter of those disciplines: the planners and designers themselves in conjunction with specialist contributions appropriate to the problem at hand.

A predictable problem looms ahead from current moves to make EIA statutory with specified techniques and procedures. The strong probability exists that with bureaucratization of EIA, techniques and associated EIA reports will be elevated from the position of being means to an end to the status of ends in themselves. This may in turn detach EIA from the planning process giving it a life of its own that will ultimately be unsustainable because the results born in, and issuing from, this detached position will be neither credible nor practicable.

It needs to be said that the single most important contribution that EIA, like PBS and CBA before it, has made to the planning and design disciplines is simply this: it has served as yet another reminder that planning decisions, and the actions that flow from them, have social and biophysical consequences. This statement may seem so self-evident as to be superfluous but the conditions of environmental deterioration already referred to belie this.

The only relevant end and ultimate justification for planning is the enhancement of social and biophysical well-being. Spatial planning is either directed to this end or it has little purpose at all. It is axiomatic, therefore, if planning is being carried out to this end, that social and biophysical concerns are at the core of planning philosophy, influence planning procedure, and directly inform planning products. It cannot be otherwise.

CONCLUSION

The CPA's endorsement of the environmental content of structure plans is correct and commendable. However, given the quite specific implications that the biophysical environment holds for spatial planning it is highly desirable that the CPA should be less reticent and clarify its expectations in this regard. Those responsible for preparing structure plans, as well as those required to assess and approve them, should be in no doubt as to what is expected.

Environmental protection and the designation of nature areas is a component of the much wider and more dynamic activity of environmental conservation. This is a specialist field which impinges on the work of planners. Fruitful interdisciplinary cooperation is essential and therefore demands that planners appreciate the objectives of that field and contribute actively to their attainment through involving biophysical specialists and holists at appropriate stages in the planning process. By the same token biophysical specialists and holists need to be clear about the proper concerns and limits of their field and the way in which it relates to spatial planning.

The contribution of biophysical processes to spatial order and place-making is fundamental and the procedure set out in Figure 4 contains the necessary steps for realising this contribution. This procedure does not, however, produce a structure plan for its products have to be brought into creative conjunction with the many other informants (social, economic, technological) that also contribute to spatial order and place-making. The checklists in Annexures A-C, Figure 1, contain some of the material included in Figure 4 but, in the absence of supportive explanation in the Manual, they also contain a built-in weakness, namely, that they may lead to the production of large volumes of descriptive material having little interventive utility. This should be avoided at all costs.

The promotion of environmental performance, with a view to sustaining life in all of its rich and varied forms, is the proper context within which to consider environmental impact assessment. Unfortunately, EIA has become little more than a convenient 'buzz phrase' to some professionals, while others believe it to be the essence of planning procedure. As must now be clear it should be regarded as neither of these but simply as one important, but limited, element of the planning process.

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