


27.8.1970

Speakers Copy

Annotated

Copy 

27.8.70.

A SYSTEMS APPROACH TO THE
POLLUTION PROBLEM

A Joint Paper by

George Clarke

B. Arch. (Syd), Dip. TP (London)
Master of City Planning (MIT),
FRAPI, MTPI, FRAIA,
Chartered Town Planner (UK)
and Certificated Town Planner (NSW)

and

Neil Ingham

Dip. TCP (Syd), MRAPI,
RS, MIS Aust.
Surveyor and Certificated Town
Planner

August, 1970



A SYSTEMS APPROACH TO THE POLLUTION PROBLEM

1. THE NEED FOR SYSTEMATIC PLANNING

We are living in an age the like of which has never been seen before. Today the standards of living are higher, the infant mortality rate lower, the life expectancy longer, than the world has ever known. People are better educated, better housed, better fed, have more motor cars and commit more crimes than ever before. ✓

We are living in a world of excesses. On every hand our senses are bombarded with the biggest, the most powerful, the fastest, the most economical, the sexiest, the ugliest, the most destructive. ✓

The period since the industrial revolution has seen major changes in employment, in living habits and in social interaction. Man has tended to congregate around the major employment centres and the growth of cities has out-stripped their capacity to provide even the basic amenities for modern civilisation. The population explosion of the cities has not abated and, like the dog chasing his tail, the task of catching up with the backlog in essential services and public amenities seems an impossible task.

The rate of change is accelerating. In fact, the changes in our living patterns, living standards and employment opportunities have occurred so fast that we have been completely unprepared for the attendant problems that have appeared upon our urban scene. We can no longer afford to sit back and adopt a "wait and see what happens" attitude. We need to plan ahead as we have never had to do before.

→ & to plan more comprehensively

& at all levels simultaneously



2. THE POLLUTION PROBLEM

2.1 The Problem Is Wider Than Air And Water Pollution

Someone has said that the world's ills revolve around the "three P's" - pollution, population and poverty. Pollution is certainly one of the major problems today, if not the most important.

~~The mass media and the public have recently been galvanised into protest over the pollution issue, but so far attention has been concentrated on the major issues of water and air pollution. These are the issues upon which our community has focused its wrath.~~ The public at large can see the effect of air and water pollution upon our environment and can therefore react to this invasion of the public domain.

Pollution has many forms and many faces. The most obvious ones concern the disposal of waste products. Much can be done to alleviate this problem through control devices, ~~through population control and through land use control.~~ Population control has a direct bearing upon national and regional density; land use control has a much greater bearing upon where those people will live and what they will do. The location of industry, for example, will have a significant bearing upon both the control of pollution and its effect upon the total environment.

✓ Regardless of where we live or what we do we all have waste products which must be disposed of. Pollution is concomitant of a technological society with a high standard of living. As urbanisation increases the problems of disposal will increase. Today more is made and more is thrown away. And today there is no escape. As the Committee on Pollution of the National Academy of Science noted in 1966, "As the earth becomes more crowded, there is no longer an 'away'. One person's trash basket is another's living space".

*distribution
planning*

Mullins

Syd. does not have a river system
- only an estuarine system

Upper reaches of Platte River.

Part of system past Silverwater Bridge
- thin film of oil

beginnings of bad situation

Pollution definitely apparent at Harbor Bridge.



We know that public outcry and the Barton report have pushed the State Government into taking steps to control air and water pollution. These issues are important, but to keep our eyes focused only here is to do a disservice to the basic problems confronting urban Australians. Pollution is not just a matter of air and water pollution. The problem involves more than clearing up trade waste and sewerage disposal, together with the emission of smoke and fumes.

The basic problem is one of proper and systematic management of our total environment. The basic question is ~~whether man can~~ ^{how to} achieve a dynamic equilibrium with ~~his~~ ^{our} environment thus averting destructive im-balance.

Sir
Barfield
stressed
concept
of balance

~~Ecologists tell us that if the population of a species exceeds the carrying capacity of the resources within the occupied area, the species undergoes reduction. It is inevitable that man is moving rapidly towards this situation. And here we are talking not only of the capacity of land to provide food for man's need.~~

~~Man's needs are satisfied by a variety of resources. The problems are not only ecological. They are social, economic, psychological, political and in the final analysis, moral as well.~~

Sir Barfield

2.2

A Systems Approach To The Pollution Problem

~~Now let us recall the title of this paper "A Systems Approach to the Pollution Problem". There is a standard method of determining which environmental properties are significant. The method involves approaching each of these properties as inter-related variables of a system and determining the effect upon the system of change in any one of the variables. To illustrate the point, if we assume the body is a system, a malfunction of any part of the body will affect the whole system to some degree. Knowledge of the affected part and of the degree of malfunction will determine what effect it has on the whole body.~~

System - a complex of
inter-dependent variables

National system - E Coast.
Local → sub systems



We must view our total environment as a system and view change to any part of the environment in the light of its likely effect upon the total environment and upon the resultant quality of life of the inhabitants.

The answers do not lie solely in controlling air pollution and water pollution, even assuming these can be satisfactorily controlled or overcome. The answer lies in intelligent management of our total resources ensuring that any unfavourable change to our environment is checked.

~~It is not enough to emphasise the economic gain of an industry to a community if the happiness and living conditions of the community are reduced. We must have regard to social attitudes and other intangible factors in exploiting our natural resources.~~

This will demand a rethinking of Australian attitudes to nature. It will require a new moral and ethical approach to the use of land. Historically, ~~man~~ ^{Australians} has regarded the natural world as his adversary. ~~He has conquered and exploited land for his own ends.~~ He has destroyed natural ecologies without regard to the effect upon the total environment or upon his fellow man. He has treated land as an unlimited resource to be continually exploited. All this has been done in the name of progress. This attitude must give way to an ecological conscience. A respect and understanding of the total ecosystem of which we are a part.

2.3

The Town Planners Definition Of Pollution

Now let us look at the ^{Urban} ~~Town~~ Planners concept of pollution.

Webster's New Collegiate Dictionary terms pollution "To make or render unclean; to defile; deseccrate; profane".

A definition adopted by the United States Presidents Science Advisory Committee's Environmental Pollution Panel is:



"Environmental pollution is the unfavourable alteration of our surroundings, wholly or largely as a by-product of man's actions, through direct or indirect effects of changes in energy patterns, radiation levels, chemical and physical constitution and abundances of organisms. These changes may affect man directly, or through his supplies of water and of agricultural and other biological products, his physical objects or possessions, or his opportunities for recreation and appreciation of nature".

The second definition talks about the "unfavourable alteration of our surroundings". If we accept this definition (and planners do) then we must go well beyond air and water pollution in discussing pollution problems.

2.4

Other Forms Of PollutionVisual Pollution

An obvious additional form of pollution is the visual destruction of our urban scene. With incredible numbers of poles, wires, signs, signals, and television antennae assailing our gaze in every direction, we are becoming akin to caged lions; a rather pathetic result of the environment we cannot seem to escape. The butchered trees, the garish signs, the tin sheds, the endless red-roofed single dwellings, the dumped rubbish, the slimey drains, the endless strings of cars, the red and yellow traffic lights, are all a part of the urban scene we see with our eyes but which seldom leaves any lasting impression on our minds.

We have become blind to beauty because we have failed to see its destruction and we have failed to recreate any of the beauty we have destroyed. We have been prepared to accept situations where the pedestrian is pushed out of his traditional meeting place, the market or shopping precinct, by the motor car. This is a situation which can be overcome with sensitive and informed planning.

Noise Pollution

Noise is another form of pollution which we hear little about, except in relation to aircraft noise. But it does create an unfavourable alteration to man's environment.

The effect of its intrusion upon the urban scene depends largely upon the individual. However, even having regard to the individual reaction, escape from noise of one kind or another within the city is becoming more and more difficult.

We have introduced into the City of Gold Coast Statutory Planning provisions controlling the level of noise emissions from individual sites. But even this does not get down to the worst noise pollution problem of all - the motor vehicle. A successful attack on this problem must be made through the international oil and automobile industries, backed up and spurred on by Commonwealth and State legislation and enforcement.

Pollution of Primitive Areas

A further obvious form of pollution, in our definition of the word and having regard to the total environment, is the destruction of primitive areas necessary for the mental health and wellbeing, not only of today's population, but of future generations. Reservation and preservation of suitable and accessible areas is essential. The mass escape from the city at weekends is evidence of our Australian need to keep in contact with nature. The problem at present seems to be that without an ecological conscience, we are polluting our play areas with bottles, tins and other waste products.

We haven't said anything about air and water pollution because we would only be repeating what we read in the press almost daily. We are not minimizing their effect upon the community. Fortunately, we are beginning to see the problem before it gets to the stage it has in New York, Tokyo and Los Angeles.

What we are saying is that to create an authority or authorities to control air and water pollution is just not enough. This will perhaps solve part of the problem, but it will only direct attention away from the real issue - that of investigating the total environment and determining how our total resources should be used for the total benefit of the

people of Australia. If we do not do this, it may be that, regardless of the number of gadgets with which we are flooded, we will not be able to find happiness, satisfaction and fulfilment in life and could ultimately destroy ourselves.

There have been examples in the past where animals have not had the ability to adapt to their environment. The inevitable result is extinction of the species. You may argue that we have a peculiar dominance over our ecosystem, and that is quite correct, but we are not independent of it, and must bear the consequences of any abuse of it.



3. PLANNING EXAMPLES OF POLLUTION CONTROL
THROUGH RESOURCE PLANNING

~~As a firm, Urban Systems Corporation has been concerned for a number of years at man's approach to his total resources.~~ We have been advocating a comprehensive approach to urban problems so that policies and priorities for urban form and growth are researched, considered and resolved before the specific details of land use are determined. In this way it is possible to structure a region and allocate regional resources in such a way as to enhance and benefit the people living within the region.

3.1 Gold Coast Strategic Plan

This approach has been adopted on the Gold Coast in Queensland where particular needs have led to specific policies, priorities and procedures for action. Our Strategic Plan for the Gold Coast says that:

"The planning profession is coming increasingly to prescribe that, in many cases, the first act of regional planning should be to select those parts of a region which should be conserved as National Parks, Nature Conservation Reserves or Wilderness Reserves. The selection of areas for urban development then becomes a second priority. In the case of the Gold Coast Region, this order of decision-making has been adopted as a basic principle in the formulation of the Strategic Plan."

The approach has not solved all the problems. So much irresponsible development has taken place that it will take many years and much assistance to bring about the quality of life we are seeking to create.

But a trend has been reversed. Green wedges of open space will be preserved from the subdividers bulldozer. A major National Park will be created (major in terms of visual amenity and convenience) within the city. The beachfront will be protected from a continuous concrete jungle. Pedestrians will have space to congregate and stroll in the major centres. Industrial waste will not be allowed to be discharged into creeks and waterways. Human values and needs have been considered and catered for.



3.2

Reservation of Coastal Primitive Areas - National Scale

Perhaps the most critical area in which a thorough study of regional resources should be made, is along our eastern and western seaboard. ~~A recent Cheshire publication entitled "Australian Society" included a section dealing with "Urban Australia". Commenting upon the rapid urbanisation of our coastline, George Clarke says:~~

"A close reading of several excellent recent reports on decentralisation produced for the New South Wales and Victorian Governments leads one to expect that this current pattern of coastal urbanisation will be further intensified in the future. Coastal 'growth centres' are more likely to succeed than any selected inland, with or without governmental subsidies. Further mining and port developments, together with associated industrialisation, are spurring coastal or near-coastal urbanisation in every State. Increased population concentration along coastlines is also spreading outwards from the mother-cities, and is tending to infill coastlines between ports and industrial centres, as rising percentages of the population seek retirement or second homes by the water. It is ~~too~~ not unreasonable to suggest that by the early twenty-first century, Australia will even more clearly exhibit a series of lineal coastal chains of urban settlements, along such Pacific Ocean frontages as between Cooktown and Townsville in north Queensland, and Bega and Eden in southern New South Wales, along such Indian Ocean frontages as between Geraldton and Bunbury in Western Australia, and along such Bass Strait frontages as between Orbest and Mount Gambier, George-town and Wynyard."

~~The author later presents a course of action for our coastal urbanisation.~~

"We can seek to crystallise this new suburban and ex-urban development around new or expanded existing town centres, separating each low density cluster from



the next by belts and wedges of bushland,
untouched coastline, and national parks. We
have the beginnings of this system in that the
northern edge of Sydney is defined by the
Ku-ring-gai Chase and its southern edge by
the Royal National Park at Sutherland. Similarly,
the northern edge of coastal urbanisation
sprawling from Newcastle needs to be defined
by the proposed 96,000 acre Myall Lakes Nation
Park. Again, a Moreton Bay National Park,
comprising, North and South Stradbroke and
adjacent islands, is needed to separate, define
and maintain the identity of Brisbane and the
linear coastal Gold Coast urban region.

A series of such national parks is needed to
give form, structure and identity to the continuing
urbanisation of the 1,500 to 1,800 miles of Pacific
Ocean coastline between, say, Cooktown or
Townsville, and, say, Bega or Eden. Within
each major 'bead' on this string of urban settle-
ments, we could strive to turn our traditionally
mono-centric mother-cities into coherently
poly-nucleated regional clusters of cities. We
could strive to create real 'cities in the suburbs'
as we plan for continuous growth. This ~~currently~~
~~seems to be the only sensible vision and practical~~
~~pattern for the future of Urban Australia that can~~
~~be derived by the creative synthesis of accumulated~~
~~knowledge and experience in the field of urban and~~
~~regional studies.~~ The pattern may already be
emerging, for example, along the Queensland coast."

The emerging centres are given as Cooktown, Mossman,
Port Douglas, Cairns, Gordonvale, Innisfail, Tully, Ingham,
Townsville, Ayr, Bowen, Proserpine, Mackay, Yeppoon,
Rockhampton, Gladstone, Bundaberg, Maryborough, Gympie,
Nambour, Redcliffe, Brisbane, Gold Coast, Tweed Heads,
and so on, into New South Wales.

There are all too few primitive areas of our coastline left.
Too little is being done to ensure the preservation of those
areas necessary for the ecological balance of the system.
To a significant degree in the past, we have been unaware
of the problem. At this point of time however, the same
excuse cannot be made. The time for action is now.



3.3

Myall Lakes National Park

Our firm carried out a study for the Myall Lakes Committee of the National Trust, National Parks Association, Australian Planning Institute, and others in 1969. We were concerned with the prospect of mining operations destroying the ecosystem of this area. We recommended the use of this area for specific recreation purposes in selected locations. The native flora and fauna would thus be able to live alongside urban man. The holiday maker and the weekend sight-seer would reap the benefits of the solitude, whilst being able to observe and appreciate nature.

In the Myall Lakes study, we can see an obvious case of conflicting interests. The Mining Companies cannot be blamed for seeking out minerals and the rights to mine those minerals. The Minister for Mines is charged with the responsibility of ensuring that our mineral resources are exploited in the interests of National wealth. He is also charged with ensuring that minerals are extracted from land before urban development takes place. He is not required to concern himself with the total environmental effect of mining. Someone has to decide which is more valuable, the minerals or the natural ecosystem. In this case a National Park reservation of 18,000 acres has been approved by Cabinet, but with population growth, the area is not large enough to fulfil its regional function. The area proposed, excluding the lakes, was 69,000 acres.

3.4

Local Amenity

Very often the smaller and more convenient public spaces are more valuable than the larger and more remote National Parks, although both are important and necessary. Wynyard Park and Macquarie Place are both gems of a different kind to National Parks. Their destruction, which is not contemplated, would be as much a form of pollution (unfavourable alteration to our surroundings) as the dust particles and grit being belched out of Pyrmont Power Station.

At the micro scale, it is often difficult to visualize the effect of individual decisions upon the environment. Local authorities valiantly attempt to do so amongst a morass of codes and ordinances. In many cases the resultant community has not been cohesive or convenient. Identity and sense of place have been lost. Visually, the results have often been unpleasant. This type of environmental pollution is difficult to foresee and even more difficult to prevent.



4.

POLLUTION CONTROL THROUGH STRATEGIC PLANNING

The Urban Systems Corporation sees a solution to the problem through strategic planning; i. e. identifying the total resources and basic problems for each local government area and adopting principles, priorities and procedures for further action. Individual decisions can then be made in the light of the aims for the total environment. In most cases a detailed investigation of an area will result in improved living conditions. These will be achieved in terms of greater convenience of amenities, minimised conflict between pedestrians and the motor car, more public open space, etc.

In a study at Artarmon, carried out for the Willoughby Municipal Council, it was possible to set policies and procedures to achieve an increase from 8% to 14% in the open space content and to reduce the space occupied by roads from 28% to 19% of the total area. A pedestrian movement system was evolved and many streets were closed to through traffic. Wedges of green will be seen throughout the whole area. The resultant environment will not only be more satisfactory to live in, but will also be less costly to maintain through reductions in street maintenance and cleaning.

4.1

Local Authority Action

Sir Garfield said - lets get busy now.

We are suggesting that we do not have to despair because local authority areas are, what we would term, built up. Sound policies and detail plans for redevelopment of particular neighbourhoods can achieve a great deal. Patterns of living and standards of living have changed dramatically since subdivision and road patterns were evolved for our inner and middle ring suburbs. These changes require a new look at the existing structure of these areas. The resources of each area must be first studied in relation to the total region. Once this has been completed the detailed studies of individual areas should be initiated. It is an unfortunate fact of life today that only after problems have become obvious is the necessary action taken to reverse the



undesirable trends. This is bolting the door after the horse has gone.

Councils must take the initiative in regard to development within their own areas. Statutory Planning Schemes are essentially negative and certainly do not result in the kind of living and working environment that we would like to see. Positive action must be taken and guidance given to developers. In this way we will get our goals set before the existing development or redevelopment forces us to accept a second best situation.

Schroder pointed to
"fragmented authorities".



14.

5.

SUMMARY AND CONCLUSION

So we come back to where we started. The problem is one of proper management of our total environment. Can we learn to control pollution so that it does not adversely affect our quality of life?

Can we achieve a dynamic equilibrium with our environment and thus avert destructive imbalances? Can we create cities that will give rise to man's highest aspirations?

Let us hope the State Pollution Control Authority uses its powers to carry out thorough research into all forms of environmental pollution.

The shortsighted view is to control air and water pollution as separate issues. The saner approach is to treat the total environment as a system and to determine the effect of changes in any part of the system upon the whole, and specifically upon the people within the system.

Only this week Professor Fenner (Director of the John Curtin School of Medical Research at the A.N.U.) was quoted as saying:

"If man and most other living things are to survive we shall have to adopt a new ethic based on ecological premises; that is, on the realisation man is continually interacting with the whole of his environment, living and not-living".

Sir Macfarlane Burnet goes as far as to say:

"I can see no enduring civilisation, unless we are prepared to work for a stable human ecosystem that will comprise the world as a whole".

If we can understand the basic needs of man we will take a long hard look at how we are measuring up to the problem. The strategic approach is the only satisfactory way, whether for Nations, or for States, or for regions, or for local authorities. Total resources, problems and needs are evaluated and resolved. Policies and procedures for action are established and implemented.

This approach is what we mean when we call for "A Systems Approach to the Pollution Problem".



BIBLIOGRAPHY

Australian Society; Edited by E. Davies and S. Encel.
Cheshire, 1970.

Environmental Conservation; by R. F. Dassmann.
John Wiley and Sons, 1964.

The Quiet Crisis; by Stuart Udall. Holt, Rinehart,
Winston, 1963.

Pollution Reader; Based on the National Conference on
"Pollution and Our Environment", held Montreal, Quebec,
October 31st - November 4th, 1966. Harvest Books
Limited, 1968.

Research into Environmental Pollution; Report of five
World Health Organisation Scientific Groups. United
Nations, 1968. (Technical Report Series No. 406).

Man and the Quality of His Environment. Western
Resources Conference. Edited by Ernest J. Flack and
Margaret Shipley. (Papers presented at the Conference,
University of Colorado, Boulder, July, 5th - 7th, 1967).
University of Colorado Press, 1968.

Artarmon Redevelopment Plan. A Report prepared for
Willcoughby Municipal Council by Clarke, Gazzard and
Partners, 1969.

Gold Coast Strategic Plan 1970-1990; Prepared for the
Council of Gold Coast by Clarke, Gazzard and Partners,
1969.

National Park Proposal for the Myall Lakes; Prepared
for the Myall Lakes Committee by Clarke, Gazzard
and Partners, 1969.