
THAT MUCH ABUSED WORD 'ENVIRONMENT': A PROBLEM OF DEFINITION

Patrick J. Schembri

IT is, perhaps, best to start with defining what we mean by the term 'environment education'. One definition is 'the imparting of knowledge on fundamentals about the environment that informed citizens should know if they are to deal intelligently with the complex environmental issues of modern living'. Not everybody will agree with this definition but it can be regarded as a working one before one proceeds to deal with the nub of the matter – what is this 'environment' that we are educating about?

To some this may seem a trivial question since everybody intuitively knows what the environment is and expressing this concept as a formal definition is an academic exercise of little practical value; but is it? Stop for a second and think about what you understand by *environment* then quickly jot down a definition, however unrefined, that expresses your conception of this term. This exercise was attempted with a class of some 50 students attending the University of Malta's Diploma Course in Environmental Science. Most definitions offered centred on the theme of 'all that is around us' or 'all that affects man' or 'factors which affect life'. There is no reason

'A personal definition of *Environment*'

By environment is meant the entire range of external factors, both non-living (*i.e.* physical) and living (*i.e.* biological), acting upon the organism.

From the human viewpoint, the environment may be divided into: (i) the *natural environment* and (ii) the *human environment*.

The natural environment comprises living (= biotic) and non-living (= abiotic) components. The living components are species which are organized into populations, which are in turn organized into communities and ecosystems (a term which describes the community of living organisms, the region they occupy (= habitat), their interaction with each other and with the physical environment and the flow of energy and matter through them). The non-living component consists of the physical life-support systems of the planet: geophysical, atmospheric, hydrological, the material which forms them and the energy which drives them.

The human environment consists of the physical and biological forces of nature which surround and affect the life of man, and the interaction of man with these forces. These include the same natural processes which affect all other life on the planet but also others of special importance to humans, such as urban living, land-use, transportation, and environmental quality.

to think that a repetition of this exercise with any group of people would yield different results.

All the definitions offered are good ones but do they actually tell us anything? All that is around us and/or affects life really leaves very little that is not part of the environment! What we need is a definition that breaks down what these factors 'out there' could be such that we might focus our attention on each in turn and, having an appreciation of the constituent parts, we may gain a better understanding of the whole. Before proceeding with doing this, however, one point raised by the class definition exercise described above deserves attention. This is that all the thumb-nail sketches of environment put forward fell into one of two classes: environment was either defined with reference to man (e.g. the 'all that affects man' type of definition) or else was defined in a more general way (the 'all that affects life' type of definition). We may call definitions of the first type *human-centred definitions* and those of the second type, *life-centred definitions*. This dichotomy of approach suggests that there are two components to the environment, a view further strengthened by the expressions *human environment* and *natural environment* that one finds continuously used (including in the programme of this workshop!). Are there really two kinds of environment?

Strictly speaking there are not. Humans are but one of several million different forms of life found on our planet and the second definition really encompasses the first. Having said this, it is members of the human species that are discussing the environment so it is understandable that they should be concerned with the factors that affect their life above all else, and this should be reflected in our final definition.

It is often said that we are products of our backgrounds and I shall be true to my training in the life-sciences and approach the environment from the biological point of view. As a biologist, my definition would be 'the entire range of external factors both living and non-living acting upon an organism'. This definition applies to all life, from a bacterium to a whale, but I want to give special importance to human life so my definition would continue 'from the human viewpoint, the environment may be divided into two: the natural environment and the human environment'. Let us now consider each separately.

The natural environment has two components: the living component, or as biologists would call it, the biotic component, and the non-living or abiotic component. The living component is all the organisms that inhabit the plant: in short, life. These organisms group together into units which we call species. Defining *species* is almost as great a problem as defining the environment, but at least for those that reproduce sexually we can take a

species to be a group of organisms that breed together but do not breed successfully with others outside their own group. On this definition, the domestic dog, cat, donkey and horse are all separate since they either do not interbreed (e.g. cat/dog) or else if they do (e.g. horse/donkey) their offspring is not fertile (mule).

Each species is organized into populations, that is, a group of conspecific individuals (i.e. belonging to the same species) that occupy a given area at a given time and actively interbreed. Note the key words: *conspecific*, *area*, *time* and *interbreed*; the members of a population must be of the same sort, occur together in the same place and at the same time, and breed together.

Populations are in turn organized into larger units called communities. Biologically a community is a collection of populations of different species that occupy a given area at a given time and which interact with each other. The key concept here is *interaction*, occurring together in the same place and at the same time is not enough, the different species populations must also act upon each other. There are many ways in which this could happen: one species may feed upon another or one species may use another for support (e.g. lichen growing on tree bark) or two species may compete together for some resource needed by both, and so on.

Let us now analyse the non-living or abiotic component of the natural environment. This consists of the physical systems upon which life depends and of which there are three: land, water, and air, or more scientifically, the geophysical, atmospheric, and hydrological systems comprising not only the material which forms them but also the energy which drives them.

Having split the natural environment into the biotic and abiotic components, we must keep in mind that each acts upon the other and modifies it. To take but one example: soil is composed mainly of fragmented rock (abiotic) with added organic material (biotic); soil is formed by physical erosive agents such as percolating water, ice, and wind (abiotic) but also by the action of living organisms such as microbes and fungi (biotic). Neither the biotic nor the abiotic component alone is sufficient to produce soil but rather it is a product of the interaction of both.

In biology, the term ecosystem is used to describe the interaction of the biotic and abiotic components. An ecosystem consists of the community of living organisms, the region they occupy (which is called their habitat), their interaction with each other and with the physical environment and the flow of energy and matter through the system. As an example of an ecosystem let us take the relatively simple one that is found on the flat stone roofs of traditional Maltese houses. The species present here include various types of lichens, mosses, small arthropods, and microorganisms. Their habitat is the

exposed limestone of the roof. Numerous interactions take place: lichens colonize the bare limestone and break it up, making the substratum suitable for colonization by the more complex mosses. These provide shelter for small arthropods and microorganisms which in turn break down organic matter released by the lichens and mosses. Energy flows through the system initially in the form of sunlight which the lichens and mosses trap for photosynthesis and thereafter in the form of 'food energy', that is, organic matter that is synthesized by the plants and becomes available to the non-photosynthesizing organisms of the system. Matter which flows through the system includes water from rain and condensation and other inorganic compounds necessary for life (nutrients) from the atmosphere, the substratum, and the dust which settles on the roof. The ecosystem just described occupies an area of just a few square metres but the same concepts apply to all other ecosystems of any size: a pond, a lake, the ocean . . .

The scientific study of ecosystems is one concern of ecology, others being the study of communities, populations, and individual species. Having mentioned the word ecology, I should like to digress slightly and point out that *ecology* and *environmentalism* are not synonymous. An ecologist is a biologist engaged in the scientific study of living organisms in relation to each other and to their physical environment. An environmentalist, on the other hand, is one who seeks to protect and improve the environment.

What of the human environment? This consists of the physical and biological forces of nature which surround and affect the life of man, and of the interaction of man with these forces. As already pointed out, man is but one of several million life-forms that live on this planet and as such these physical and biological factors are the same one that affect all other organisms. There are some however that are of special importance to humans, for example, urban living, transportation, land-use, and environmental quality. I will leave it to the speakers which follow to expand upon this aspect of environment.

We have come a long way from our first definition of 'all that affects life' and in so doing have seen that what affects life is a complex set of factors and processes that are intricately interrelated. As an appendix to this paper I provide a summary of the foregoing discussion in the form of a definition of environment. I stress, however, that this is my personal definition and that differently worded statements, stressing different aspects, are possible.^{1, 2} However, whatever definition is used, it should by now be obvious that *environment* is a much-abused word, especially locally. This is perhaps understandable when one considers that we have only started becoming conscious of the environment in which we live and of the environ-

mental problems that face us relatively recently. Abuse of this word ranges from the trivial to the serious. Thus, at one level we find ecological movements³ – a term that does not make sense unless the members are biologists concerned with the scientific study of the relationships between organisms and their environment. More worrying is the local environmental legislation which deals only with a limited subset of factors that are important in shaping and maintaining our environment, and these in an unintegrated way; other factors are completely ignored.^{4, 5} A Government agency concerned with the environment has existed in various guises for some time but then we find that it has no jurisdiction over certain key areas of the local environment.¹ Again, although both main political parties included sections on the environment in their 1981 electoral programmes, these were mostly concerned with a narrow segment of the totality of factors that shape our environment,^{6, 1} a situation memoranda to the political parties on environment-related items to be included in their electoral programmes for the 1987 elections.^{2, 4, 7} The environment has suddenly become fashionable and has started to feature prominently in the local media. Glibness and the use of buzzwords are no substitutes for real understanding however, which is what is really necessary if we are to tackle our not inconsiderable environmental problems.⁸

Let us go back to our point of departure – environmental education. How aware of the environment is the local population, particularly the younger, school-going generation? This is an area which my colleagues and I are actively researching. Although not complete, I should like to present here some of our results. We asked students what they understood by *environment*. Responses were graded into five classes: 0, no answer; I, a very limited idea of what the environment is (a typical type I response was 'the environment is keeping the streets clean'); II, only one aspect of the environment was mentioned (e.g. 'to me the environment means nature'); III, multiple aspects of the environment were mentioned (e.g. 'all that is around us'); and IV, multiple aspects were mentioned and elaborated upon (e.g. 'the environment consists of nature and human constructions'). The table overleaf shows the scores obtained by four separate groups of students from different local educational institutions.

Although the sample is very small, some trends are nonetheless evident: very few students (except technical school students) did not have any idea what the environment was (type 0 response), but then few also could give a good definition (type IV response); most responses were types II and III with type III predominating in the sixth-form group, type II in the two secondary-school groups, and an almost equal distribution between the two types of the technical-school group; type I responses (only a vague idea of

School:	Sixth Form (mixed)	Technical (males)	Secondary (males)	Secondary (females)
number:	20	31	22	21
average age:	18	17	14	14
response (%):				
0	0	22.6	4.5	0
I	15.0	3.2	27.3	28.5
II	35.0	32.3	59.2	42.9
III	45.0	38.7	4.5	23.8
IV	5.0	3.2	4.5	4.8

(Fiott, J.; Grech, P.; Schembri, P.J. & Ventura, F., unpublished data).

what the environment is) were quite high in the secondary-school groups and surprisingly, also in the sixth-form group; there are also differences between the sexes in the secondary school groups.

My objective in presenting this data is for us to gain an insight into whether there is need for developing further environmental education in Malta or whether the current level of activity in this field is sufficient. I hazard to suggest that we have still some way to go before we can say that the Maltese people as a whole are sufficiently informed about the environment to be able to appreciate it and manage it wisely.

1. Ċentru Tmexxija Soċjali, *Proposti dwar l-ambjent*, (Valletta: Moviment Azzjoni Soċjali, 1986).
2. Żghazagh għall-Ambjent, *Memorandum dwar l-ambjent*, (Valletta: Bord Pubblikazzjonijiet, Żghazagh għall-Ambjent, 1986).
3. *Dikjarazzjoni ta' principji u manifest '83*, (Tal-Qroqq: Moviment '83, 1984).
4. *Memorandum to political parties*, (Malta: Chamber of Architects & Civil Engineers, 1986).
5. Macelli, N. *Maltese legislation relating to the physical environment*. (Valletta: International Environment Institute, Foundation for International Studies, 1986).
6. H. C. Vassallo, '*Il-qasam dwar l-ambjent*'. In: MIFSUD, T. (ed.) *Malta centru ta' Paċi: 'Il quddiem flimkien. Il-programmi elettorali tal-Malta Labour Party u tal-Partit Nazzjonalista (1981) meħudin flimkien: studju u sintesi*. (Valletta: Ċentru Tmexxija Soċjali, Moviment Azzjoni Soċjali, 1985).
7. *Memorandum to political parties on the inclusion of items dealing with the conservation of the natural environment in electoral manifestos*. (Valletta: International Council for Bird Preservation (Malta Section), 1985).
8. T. Macelli, *State of the environment*, (Valletta: International Environment Institute, Foundation for International Studies, 1986).

PATRICK J. SCHEMBRI, B.Sc., M.Sc., Ph.D. (Glasgow) is Associate Professor in the Department of Biology of the University of Malta where he lectures in Biology and Environmental Science.