GEOGRAPHERS AND ECOSYSTEMS: A POINT OF VIEW

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A short note pertaining to the new ecosystems section of the South African Standard 10 Core Syllabus in Geography. The ideas were presented at a workshop for teachers held in the Southern Transvaal region by the South African Geographical Society. They are intended only to provide a perspective on the geographical approach to ecosystem study - an aspect which is causing concern to many teachers at present.

The recent introduction into South African high schools of the new Geography Core Syllabus has caused a considerable amount of concern amongst many Standard 10 teachers, particularly because of the section *Ecosystems, environmental balance and conservation*. Many teachers reading this section are fearful of tackling it, mainly because they have never studied ecology or any of the pure sciences. Most of these geographers are trained in the arts disciplines and thus feel at a disadvantage even when confronted only by a 'jargon' which is unfamiliar. They perceive themselves as being inadequate and are unhappy about teaching in a 'new' and essentially 'biological' domain with which they are uncertain.

If you as a geographer are involved in this dilemma, you are not alone. An approach to the problem which I have voiced recently to geography teachers and which appears to help at least to some extent (even if only to provide a little confidence for ecosystem teaching) is to adopt the attitude:

> as geographers we are already studying ecosystems and have been doing so for years; to add the biological perspective is merely to include detail.

This simple statement is designed to illustrate to you that you are not handling 'new' and 'unfamiliar' material when you teach about ecosystems. The biological perspective may be new, but remember that it is essentially *detail* which completes the story of the ecosystem.

Ecosystems consist of abiotic (non-living) and biotic (living) components. As geographers you have studied with your students the abiotic factors (soil, water, atmosphere and solar energy) in particular, and have probably glossed over the *detail* of vegetation when considering patterns, interactions and explanations, providing only broad outlines such as the occurrence of epiphytic vegetation in Mediterranean regions.

Let us illustrate this with a typical example from geography, namely an exercise in your school grounds: you may have examined any or all of the following during the course of various exercises:

- topography: slope, aspect, geomorphological features
- soils: types, depths, distributions
- drainage: e.g. a stream on the boundary of the school grounds, or a borehole drawing on ground water
- climate: temperature, inversions, rainfall, humidity, winds etc.

All of these factors are most frequently studied by geographers in terms of distributions or patterns, and relationships and explanations. Vegetation studies are often included somewhat superficially for purposes of explanation in terms of nature and density of different types of vegetation in different localities such as a natural forest, a grassland or a vlei.

If you think about these types of studies you will realise that you are in fact studying all the features of an environment which is comprised of ecosystems. The only thing missing is the *detail* of the biota. This latter aspect is obviously the strength of the biologist, but you as the geographer are familiar with and able to provide all the building blocks of the ecosystem, to which only the biological detail has to be added. This may mean that you are in an even more powerful position than the biologist when studying ecosystems. You are familiar with an holistic approach and understand many of the processes and interactions which occur in an ecosystem. Only the biota have to be added to what you are doing already.

Your reaction to this viewpoint may be one of further concern, primarily because you do not know the scientific names, or perhaps even the common names, of many of the plants and animals. However, this is a negative approach to the problem. Are the scientific names really important or do they merely become stumbling blocks to communication and learning? I know many biologists who are unable to put the scientific labels on plants and animals. That was not the object of their original training, but it does not make them any less as biologists. Why not use descriptive terminology to which your students can also relate easily e.g. thorn tree, umbrella tree, etc.? The more precise and accurate terminology may follow at a later stage, but it is not essential to learning principles. Your major strength is your holistic, synthesising approach to an ecosystem or environment, so make the most of it.

You *do* need to become familiar with some of the language of ecology - yes. Understanding of concepts such as population, community and diversity is essential if ecosystem functioning is to be fully understood, and all are explained in most biological or ecological texts. Knowledge of the scientific names of trees for example is merely a bonus and is not essential. Just do not confuse your students by insisting that they should know such names too!

The definition of boundaries between ecosystems (where one ends and the next begins) can also present problems in ecosystem studies - to everyone, not only to geographers. We tend to think in terms of nice neat packages which are clearly separated by clearly defined walls, fences or other boundaries. In reality though these boundaries are almost always transition zones which are not necessarily obvious. If this problem is initially approached in terms of the students' experience of the components and processes of for example the classroom, a house, a rock overhang, a termite nest or a cave, all have reasonably apparent boundaries. From this starting point one can then proceed to studies of forests, marshes and other less well-defined systems with a lot more ease. Keep to the simple approach and you will find it a lot more effective and more satisfying.

In addition you should appreciate that many of your students may have studied ecosystems in Biology (Standard 8 syllabus). Do not feel threatened because of this - utilise the students' knowledge by building on it - they may be happy to complete the biological detail of the ecosystems you study. It is also useful to co-operate closely with the Biology teachers in your school, perhaps using team teaching and joint fieldwork exercise approaches. Both of these approaches can only benefit everyone involved if you recognise that you can help each other.

To study an ecosystem looking for symptoms and controls can also be fun and is a real test of understanding. Is the vegetation a reaction to

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