What is Biodiversity and Why Should We Conserve It?

by Edward Allison

What is Biodiversity? If you asked three people this question, you would probably get three different answers. We are all aware that it refers broadly to the variety of living things: we look at a catch of fish from a gillnet in Lake Tanganyika and we see that it consists of **many species**. Those who know the fishes in the lake soon realise that the same species may look different in the waters off Mpulungu to those off Uvira. These visible, or phenotypic, differences reflect **genetic differences within species**. If you are really curious and decide to look inside the stomachs of some of the fishes then you will see the diversity of small plants and animals that the fishes have been feeding on. And while you are busy with your dissections, an otter may eat some of your catch. The fishes are part of a diverse community of plants and animals that live together in the **various ecosystems** in the lake, competing for food and space to live; eating or being eaten.

Biodiversity can thus be measured at three levels; the genetic, the taxonomic (*e.g.*, species) and the ecological. This does not mean you *need* to measure diversity at all three levels—the levels you choose depend on what you want to do with the information. The question of how much you need to know about biodiversity in order to conserve it is a topic much debated by scientists and resource managers, and will be addressed in a future article. Before we begin to work out the best way to measure biodiversity;

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however, there is a more fundamental question to be asked: Why is it important to even think about conserving biodiversity?

We know that Lake Tanganyika is a 'biodiversity hotspot'. But if you ask anyone why we should be so concerned with conserving this diversity, again, each of us will have a different answer. Scientists who spend their careers studying the variety of plants and animals—how they evolved and differentiated, their complex ecological relationships—do not seek justification; their scientific interest provides enough reason. But in today's world, where the interests of conservation must be balanced with the need for development, we have to think more carefully about why we should be so concerned with 'Biodiversity'. We must recognise that our scientific interest is a minority one. We need to ask why the rest of society should be so concerned with the loss of diversity.

Do you want to eat only on or two types of fish for the rest of your life? The diversity of fishes in the lake support a diversity of fishing techniques, and the fish markets around the lake allow us a choice of fish species to eat, depending on our budget and our tastes. As I have explained above, the fishes do not live in isolation from other plants and animals in the lake. To ensure that productive and diverse fisheries continue, both for food and ornamental fishes, we need to conserve the ecosystems that support such diverse fish production. Thus, biodiversity is of **direct use** to us. Ornamental fishes bring tourists to Lake Tanganyika, tourists spend money, this is one **indirect use** of biodiversity. None of these benefits, direct or indirect, will accrue to us if the Lake Tanganyika ecosystem collapses through overfishing, sedimentation or pollution.

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What if we lose some, but not all, of the diversity of the lake? Our lake will continue to produce plenty of fish won't it? Ecologists are currently arguing that **ecosystem 'functions'**, such as the ability of Lake Tanganyika to support fish production, are related to biodiversity (including genetic diversity within populations). They argue that if biodiversity is reduced, so too, will fish production be reduced. It is not yet certain how biodiversity and ecosystem function are related and it will probably be some time before definitive relationships are worked out. Given the uncertainty, it is probably wise to be cautious and seek to minimise any losses.

So far I have argued for biodiversity conservation on the basis of its usefulness to us; I have used an economic argument that we would be poorer if biodiversity were reduced. Many feel that the preservation of a species has a value independent of any monetary considerations. Loss of biodiversity would make us poorer in terms of the satisfaction we get from life—from eating diverse foods, from the loss of knowledge about our surroundings. These '**non-use**' arguments may seem irrelevant to those with more immediate troubles, but I remember how, on our trip with the Kigoma Workshop participants to Gombe Stream NP, everyone in that beautiful, diverse forest forgot their concerns for a short time. I also recall those who were snorkeling or diving in the lake for the first time, marveling at the diversity they saw.

If you are still not convinced, you could say that all species are God's creation and so must have a role to play!

The survival of Lake Tanganyika and its biodiversity is very important to many of us around the world—that is one of the reasons for GEF's interests. If you are from the lake shore area, and are not a scientist, then I hope this article has given you some 'food for thought' as to why conserving biodiversity in Lake Tanganyika is relevant to you.

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