



Biocapacity and ecological footprint

These two concepts were developed by the Global Footprint Network (GFN) and are quantified as global hectares (gha). They provide a common basis on which to compare the biological capability of the environment to provide food and meet other essential needs, versus the demands placed by human communities on these ecological services.

Overview

If the ecological footprint of a human population exceeds the biocapacity of its environment, the situation is unsustainable. Disturbingly, the total worldwide human ecological footprint is 2.8 global hectares per capita (gha/cap), compared with a total worldwide biocapacity of only 1.7 gha/cap ([National Footprint Account](#) results).¹

This overshoot means that humanity is already using 1.65 times as many resources as are sustainably available, which is only possible for a short time; we are, in effect, already “living on the capital of the planet rather than its income.”

The overshoot for high-income countries is much more extreme than the overall average. Whereas low-income countries have a typical footprint of 1.0 gha/cap, the average for high-income countries is 6.2. The UK value is 4.9; thus we would already need 2.9 Planet Earths (i.e. 4.9/1.7) to support the total world population of 7.1 billion if everyone was to have typical UK living standards.²

Though the footprinting approach explicitly accounts for different levels of per capita consumption, it

doesn't factor in the biocapacity needed for the preservation of other species — a clear moral problem that would concern many people, and one with significant economic consequences for humanity. If capacity for other species is allowed for, we are in a situation of greater overshoot than the figures suggest.

What is a global hectare?

These terms are based on the concept of a global hectare (gha), defined as follows by the GFN:

Global hectares are the accounting unit for the ecological footprint and biocapacity accounts. These productivity-weighted, biologically-productive hectares allow researchers to report both the biocapacity of the earth, or a region, and the demand on biocapacity (the ecological footprint). A global hectare is a biologically-productive hectare with world average biological productivity for a given year. Global hectares are needed because different land types have different productivities. A global hectare of, for example, cropland, would occupy a smaller physical area than the much less biologically-productive pasture land, as more pasture would be needed to provide the same biocapacity as one hectare of cropland. Because world productivity varies slightly from year to year, the value of a global hectare may change slightly from year to year.³

Based on the number of gha per person and the number of persons, it is possible to determine how many gha are required to support a given population. These can be further analysed into the number of gha required for a number of different essential bio-resources, and that required for assimilation of wastes. The total number of gha required by a given population is its ecological footprint.

The number of hectares in a given region is converted to gha by applying a productivity factor. A small but very fertile area may represent more gha than a larger area of desert. The total number of gha in a region is defined as its biocapacity.

If the ecological footprint for a given population is smaller than the biocapacity of the area it occupies, then all is well and the population is sustainable.

If the ecological footprint for a given population exceeds the biocapacity of the area it occupies, by definition the biological capital (i.e. the “biocapacity

deposit account”) is being consumed. The whole world is currently in such an “overshoot situation”, sustained only by consuming its non-renewable capital. **Once the world’s capital is exhausted, some form of global collapse becomes inevitable.**



More information can be found on the [Global Footprint Network’s website](#).

Read about [carrying capacity](#).

References

Accessed April 2016

¹ Global Footprint Network. National Footprint Accounts, 2016 Edition. Note latest available data refer to 2012. Public Data Package download: http://www.footprintnetwork.org/en/index.php/GFN/page/public_data_package.

² Ibid.

³ <http://www.footprintnetwork.org/en/index.php/GFN/page/glossary/>