

## Optimum population: biocapacity

Extract from an OPT Discussion Paper by Andrew R.B. Ferguson, Research Co-ordinator, OPT

### Adjusting populations to match biocapacity

Reprinted from The Pherologist, May 2002.

*"It is surely self-evident that there needs to be a match between the size of human populations and the biocapacity available to them... "*

There are 1.1 billion OECD inhabitants, who have, on average, 3.42 global hectares (these are hectares with global average productivity, also called area units) per person. Since the average 'ecological footprint' [per capita ecological effect of human population] of OECD countries is 7.22 global hectares, it would seem that OECD countries must necessarily 'borrow' land from the non-OECD countries. However, 4.08 global hectares - out of the 7.22 global hectares footprint - constitute the carbon dioxide footprint.

The latter is a theoretical idea which can be challenged on a number of counts - for one thing, the whole concept is largely dependent on the need to stop carbon dioxide building up in the atmosphere. Even if the need for that is granted, there is no agreement about how the rights to use the Earth's carbon sinks should be divided between nations [although there are carbon emissions trading mechanisms]. It may be more relevant to look at the 'physical footprint' - a suitable name for the ecological footprint minus its energy component. It should be stressed that we are not ignoring the importance of accounting for carbon dioxide emissions: we are putting that aspect aside to be considered separately later.

For OECD citizens, the physical footprint is  $7.22 - 4.08 = 3.14$  global hectares per person. Thus, excluding carbon emissions, OECD countries can live within their biocapacity. It should be said that this omits to ask to what extent the agricultural practices of OECD countries are sustainable. Unfortunately, however, sustainability is an aspect that is often ignored in footprint studies.

from Living Planet Report 2000, the existing biocapacity for the 4.7 billion people living outside the OECD area is 1.82 global hectares per person. So for each person to enjoy the 3.42 global hectares available to OECD countries, the population of non-OECD countries would need to be 2.5 billion - a population reduction to 53 per cent.

### Moral implications

OECD countries have no right to impose their own views about population density (referring here to biocapacity to population ratio) on non-OECD countries. It is surely the right of every country to choose between having a low population density with the inhabitants living relatively well, and a high population density, with more inhabitants living less well. There is, however, a corollary to that philosophy: those countries which choose the high density option have no moral right to off-load their surplus population on to the countries which follow a low-density policy.

It can convincingly be argued that OECD countries have a duty to help non-OECD countries that wish to adopt the low density policy...

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While OECD countries have no right to impose their views on non-OECD countries [even within the OECD the USA is not wholly committed to liberal domestic family planning legislation or generous overseas aid], when danger is imminent, they surely have a duty to emphasise the most vital messages from their scholarship, specifically those available from the *Living Planet Report 2000*. It is clear that when the amount of biocapacity available to each person in a nation becomes too low, then unless that nation is possessed of some special source of wealth, such as oil, danger threatens. The deaths of 800,000 by genocide in Rwanda occurred when available biocapacity had fallen to 0.4 global hectares per person. A similar situation threatens in the Afghan region, taken here to include Afghanistan, Iran, Turkmenistan, Uzbekistan, Tajikistan and Pakistan. The combined population of these countries in mid-2000 was 281 million (about the same as the USA). The biocapacity available to their inhabitants was 0.7 global hectares per person. At the current rates of population growth (2.5 per cent a year in Afghanistan and 1.4 per cent in Iran), biocapacity will have fallen by 2021 to the Rwandan level of 0.4 global hectares per person.

## Carbon considerations

The constraint that the use of energy places on population is simple *in global terms*. The Earth's carbon sinks are able to absorb about 9 billion tonnes of carbon dioxide a year, from the burning of fossil fuels. A probable mean lowest acceptable carbon dioxide emission is 4.2 tonnes per person per year (to compare with the actual US figure of 20 tonnes per capita, an actual European average of 10 tonnes per capita, and an actual world average [1990, and therefore an underestimate] of 4.2 tonnes per capita. Thus to maintain a constant level of carbon dioxide concentration, global population needs to be limited to 2.1 billion - a reduction to 34 per cent of the present 6.1 billion.

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**Tel: 07976-370 221**

**Optimum Population Trust Ltd**

**(Membership Secretary)**

**12 Meadowgate, Urmston**

**Manchester M41 9LB, UK**

**E-mail: [info@optimumpopulation.org](mailto:info@optimumpopulation.org)**