WARM UP

Take nothing but pictures, leave nothing but footprints…?

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Since the United Nations Conference on Environment and Development in 1992, population growth and increases in consumption in many parts of the world have added to humanity's ecological burden on the planet without a corresponding increase in the Earth's natural resources. The World Wildlife Fund's Living Planet Report 2004 noted that humanity's ecological footprint grew to exceed the Earth's biological carrying capacity by 20%.[1]

Based on the relationship between humanity and the biosphere, an ecological footprint (EF) is a measurement of the land area required to sustain a population of any size. This methodology was first described in 1992 by Drs William Rees and Mathis Wackernagel at the University of British Columbia in Canada.[2]

Under prevailing technology, an EF measures the amount of arable land and aquatic resources that must be used to continuously sustain a population, based on its consumption levels at a given point in time. This measurement incorporates water and energy use, uses of land for infrastructure and different forms of agriculture and forests, and all other forms of energy and material "inputs" that people require in their day to day lives. It also accounts for the land area required for waste assimilation. Obviously, the size of an EF will vary depending on the natural resources consumed by a population, which in turn will depend on lifestyle choices, income levels, and technology.

EFs can be measured at an individual level, for cities, regions, countries, or the entire planet. A number of websites allow you to estimate your individual EF—for example, see http://www.carbonfootprint.com/.

At a city level, EFs can be dramatic. For example, London (UK) has an EF 120 times the area of the city itself. For a typical North American city with a population of 650 000, it would require 30 000 km^2 of land to meet domestic needs alone without even including the environmental demands of industry. In comparison, a city of a similar size in India would require 2800 km^2. At a national level, calculations of EFs involve complex modelling.[3]

EF analysis can also be used for specific activities, or to measure the ecological requirements of producing specific goods or services. One area where this technique has been applied is in sporting events.

Professor Andrea Collins of Cardiff University in the UK and her colleagues looked at the EF of the 2004 soccer FA Cup final, held at Cardiff's Millennium Stadium.[4–6] Energy consumption was converted into the area of forest needed to soak up the carbon dioxide generated in its production, and food consumption was represented as the amount of farmland needed to make it. This method gave the match an EF of 3051 hectares. More than half of the EF was due to transport. The 73 000 supporters collectively travelled nearly 42 million kilometres to reach the match. Fewer than half travelled by car, but car use generated 68% of the transport footprint. If those fans had travelled by bus instead, the footprint would have been 399 hectares smaller. Food was the second largest contributor, weighing in at 1381 hectares for the 36 500 snacks consumed. This could potentially be reduced: for example, substituting all the beef with chicken would have taken 428 hectares off the footprint. The impact of waste disposal, at 146 hectares, was low, and recycling would have trimmed the EF by a further 39 hectares.

The footprint is a useful management tool to assess the effect of activities and, it is hoped, may highlight the need to instigate measures to reduce the impact. Although there are problems related to the assumptions used to calculate EFs, nevertheless the principle would appear to be useful.

Ever since the 1994 Winter Olympics in Lillehammer, the organisers of major sports events have been challenged to reduce the harmful environmental effects of their events.

The 2006 FIFA World Cup in Germany is an example where EFs are used, and various energy efficiency and carbon offset schemes are being put in place to minimise this effect. FIFA are to be congratulated on leading the way forward for sport on this issue.

Owing to the size and scope of the 2006 FIFA World Cup, the emissions estimate is that approximately 250 000 tonnes of greenhouse gases will be produced. Each World Cup game will also use between 2 and 3 million kilowatt hours of energy, and each match will generate 5 to 10 tonnes of waste. By comparison, some estimates indicate that the 2004 Athens Olympic Games generated half a million tonnes of greenhouse gases on top of what would normally have been generated.

Major events can harm the environment by, among other negative effects which may not necessarily be reflected in an EF analysis:

- changes in land use and the destruction of natural environments through building construction, transportation, and other forms of physical development;
- the consumption of non-renewable resources;
- emissions to soil, air, and water, and the generation of large amounts of waste;
- contributing to ozone depletion, global warming, and air pollution;
- diminishing biodiversity.

There is now overwhelming evidence and justification for the need for all negative impacts to be examined and either eliminated, reduced, or, in relation to carbon emissions, offset.[7] Examples of good and best practices in a variety of situations, both sporting and otherwise, are now plentiful. Developing nations for whom technology or finance may be a barrier, such as South Africa where the 2010 World Cup Football competition will be staged, should receive the necessary financial assistance from global public and private donors to ensure that this occurs.

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