



The Ecological Footprint in a Resource Constrained World

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What is the Ecological Footprint? How does it relate to human development?

Many low-income countries have an abundance of natural resources, yet their populations often suffer first and most tragically when humanity's demand on nature exceeds what nature can renewably provide. The countries of Africa, for instance, have some of the lowest per capita [Ecological Footprints](#) in the world – in many cases too small to meet basic needs for food, shelter, health and sanitation. For the region to reduce poverty, hunger and disease, large segments of the population must have greater access to natural resources. Yet Africa's growing population and the world's escalating resource consumption are making this increasingly difficult. If Africa's countries are to make advances in human development that can persist, they will need to find approaches that work with, rather than against, the Earth's ecological budget constraints.

Effectively managing the region's natural wealth requires accounting tools that can [track resource consumption against the capacity](#) available to regenerate these resources. This is what the Ecological Footprint provides. The Ecological Footprint measures the amount of ecological services people use. This use is expressed in area of productive land and sea required to renew all the resources a person, population or activity consumes and to absorb the corresponding waste, particularly carbon dioxide emissions. It is expressed in global hectares, meaning, hectares with world-average productivity.

Ecological resources will play a crucial role in the success or failure to reduce poverty, hunger and disease. [Global Footprint Network's](#) work with human development organizations addresses the question: How can lasting human development be achieved?

How can the Ecological Footprint be used to make human development last?

By having in-depth data on resource demand and available biocapacity, decision-makers are better poised to invest in human development that can persist in the face of growing ecological constraints. They can also understand the emerging resource challenges that could undermine progress toward human development goals.

We can [assess sustainable human development](#) (shown in Figure 1 above) by using the United Nations Development Programme's Human Development Index (HDI) as an indicator of socio-economic development, and the Ecological Footprint as a measure of human demand on the biosphere. UNDP considers an HDI over 0.8 to be "high human development." An

Ecological Footprint less than 2.1 global hectares per person makes a country's resource demands globally replicable. Since every country has a [different amount of biocapacity](#) available, its constraints are shaped by both its own biocapacity and its economic abilities to access biocapacity from elsewhere. When combining the Ecological Footprint with the UN HDI, we are able to measure the minimal conditions for global sustainable development. The same approach can be used when exploring what is needed to make local development last.

SUSTAINABLE DEVELOPMENT: WHERE ARE WE TODAY?

Human Development Index and Ecological Footprint of Nations (2005)

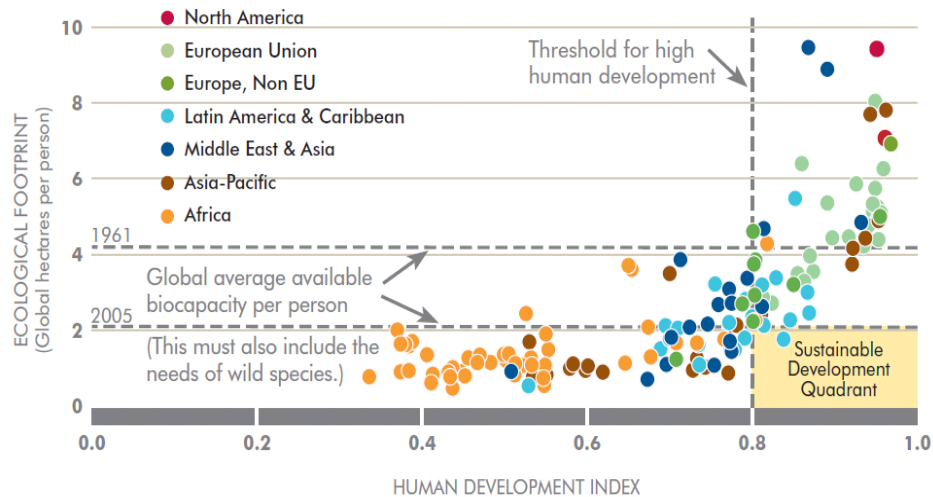


Figure 1: Sustainable Development, where are we today?

Despite growing adoption of sustainable development as an explicit policy goal, most countries do not meet both global minimum requirements. *Also, the world as a whole is [outside the box](#)*. However, the good news is that many opportunities exist to manage and use biocapacity more effectively, and to invest in human development programmes that move a country closer to within the yellow box.

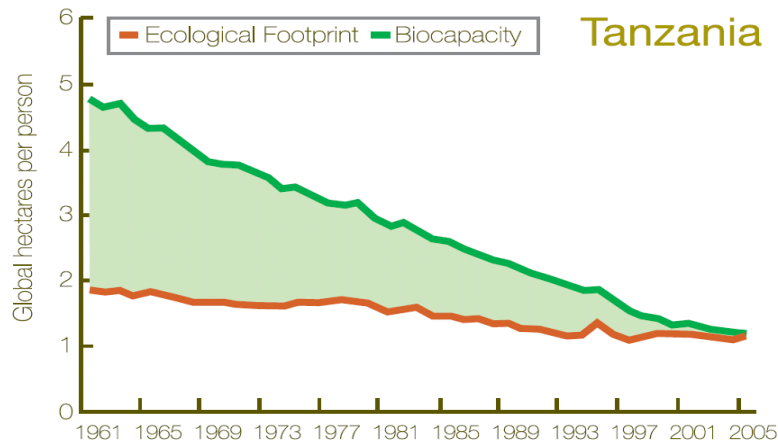


Figure 2: Tanzania's per-person Footprint and bio-capacity since 1961.

Effective management of ecological assets can help end cycles of poverty and can support changes, such as those called for in the Millennium Development Goals, which improve quality of life. The pressure that population growth puts on ecosystems can be addressed in ways that also serve to empower people and advance their well-being. Ecological Footprint accounting provides a novel perspective that can help stimulate practical solutions to the growing ecological challenges now facing Africa and the world. The example of Tanzania is illustrated

in Figure 2. Tanzania's Footprint represents the biocapacity needed, on average to provide for the average consumption of a Tanzanian resident. The biocapacity is the productive area available within Tanzania. The green surface between the lines shows the shrinking ecological remainder of Tanzania. Once the lines cross, the remainder becomes a deficit. Ecological deficits can be compensated by overusing local biocapacity or by using biocapacity from abroad, for instance through import. Avoiding ecological deficits is therefore not an additional constraint imposed upon development needs, but rather are a condition that allows development successes to last.

Investing in the future: How can development practitioners engage with the Ecological Footprint?

Future well-being and resource requirements will depend to a great degree on the infrastructure investments that are made today. Infrastructure choices can lock cities and nations into economically and ecologically risky paths of high resource dependence, or they can increase their resilience in the face of growing resource constraints. Responsible investments in energy, transportation, and buildings for health clinics and schools provide benefits that increase a country's literacy, wealth and health, the three sub-indices reflected in the Human Development Index. If these choices can be made in a way that also promotes the cities or region's resource efficiency, they will provide gains in human well-being that can persist.

Many opportunities also exist to manage biocapacity more effectively. Whether biocapacity is employed to feed residents, provide exports or sequester carbon, an accurate accounting of demand on, and supply of, biocapacity can help determine if its use is being valued appropriately.

Ecological Footprint and biocapacity data give leaders the tools they need to make these choices. In a world of growing resource constraints, gains built on liquidating ecosystems will only be short-lived, and poorer countries will be most at risk of suffering the consequences. If, on the other hand, industrializing nations can develop in a way that takes into account ecological limits, they will be best poised to adapt to resource constraints, and to provide advances in human development that can truly persist in the long-term.

Footprint assessments have been applied widely in [Europe](#), [China](#), [India](#), [Australia](#) and [South America](#). Also, over the last several years, Global Footprint Network has focused on evaluating ecological demand and resource availability in Africa, and shed light on the challenges, opportunities and risks these trends represent. For more information on how to apply these tools to country assessments, project planning or project evaluation, please contact Kristin Kane at kristin@footprintnetwork.org.

Examples of Ecological Footprint Applications:

- June 2008, [Africa: Ecological Footprint and Human Well-Being](#) (4 Mb), issued at the African Conference of Ministers of the Environment, Global Footprint Network and WWF, it offers an in-depth look at the region's resource assets and pressures. Many African countries are ecological creditors, with a potentially valuable remainder of natural assets. At the same time, booming population is causing escalating stress on available resources, bringing the region close to its ecological limits even while per-capita consumption remains, in many instances, too low to provide for basic well-being.
- The [Africa Factbook 2009](#) reports key indicators on human development and ecological performance derived from a variety of sources, including United Nations statistics (http://www.footprintnetwork.org/images/uploads/AfricaFactbook_2009.pdf). Data on 24 different countries in eastern, western, sub-Saharan and northern regions of the continent are included. Notable are the time series of human demand and ecological availability from 1961 to the present (see Figure 2). Within these publications, we selected countries that provided a representative sampling of the region's geography and had the best quality data available. The document, sponsored by the [Swiss Agency for Development and Cooperation](#) (SDC) and the [Deutsche Gesellschaft für Technische Zusammenarbeit \(GTZ\)](#), can be [downloaded here](#) (13 Mb).

- [Goldman Sachs' 10,000 Women Initiative](#), training young women in the rural lakeside communities of the Samfya region in principles of sustainable resource management. At a grassroots level, Global Footprint Network initiated a collaboration with [Camfed International](#), an organization working to empower young women in Africa by providing them the opportunity to attend school. Expanding opportunity for women has a profoundly positive effect across all aspects of society, and can also promote sustainability; giving women the access to choices and opportunity often results in not only a higher quality of life for those women, but smaller family size.

Some general sources:

1. Global Footprint Network. 2008. *The Ecological Footprint Atlas 2008*.
<http://www.footprintnetwork.org/atlas>
2. For examples of scientific reviews of Footprint accounts with national governments (including Switzerland, Germany, European Commission and European Parliament), see www.footprintnetwork.org/reviews
3. For more information on the Global Footprint Network: www.footprintnetwork.org

Note: *HD Insights* are network members' contributions and do not necessarily represent the views of UNDP. For additional information related to the subject of this HD Insights please contact anna@footprintnetwork.org.