



# NATIONAL FOOTPRINT ACCOUNTS, 2011 EDITION

A GLOBAL FOOTPRINT NETWORK REPORT



# **The National Footprint Accounts, 2011 edition**

WORKING PAPER

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## THE NATIONAL FOOTPRINT ACCOUNTS, 2011 EDITION

In the early 21<sup>st</sup> century, natural resource constraints are becoming apparent and causing structural changes in our economies. As domestic resource demand is starting to outgrow the domestic availability of resources for many countries around the world, these countries turn to international trade for accessing the resource inputs needed to maintain their level of economic and social well-being. However, in an era of global resource shortage, dependency on trade implies certain geopolitical and competitiveness risks. Economic success can no longer be secured without carefully managing and tracking the demand on and availability of natural capital. Assessments tools help visualize the scale of change we are witnessing, provide a platform for weighing policy options, and thus secure a nation's wellbeing.

Ecological Footprint analysis is such a tool and measures human appropriation of ecosystem products and services in terms of the amount of bioproductive land and sea area needed to supply these products and services ([Global Footprint Network 2012, method paper](#)). This metric assesses human demand on, and availability of, regenerative and waste absorptive capacity within the biosphere that are needed to track minimum sustainability conditions. The area of land and sea available to serve a particular use is called biological capacity (biocapacity), and represents the biosphere's ability to meet human demand for material consumption and waste disposal. Global Footprint Network's National Footprint Accounts track the resources, expressed in units of average biological productivity (or global hectares, gha) of crop and fish for human consumption, built up land, timber, grass and feed crop for livestock, and waste absorption of CO<sub>2</sub> emissions.

### National Accounts Update for the 2011 Edition

The annually updated and improved National Footprints accounts as developed by Global Footprint Network undergo continuous improvement under the advice of the National Accounts Review Committee. The quality, reliability and validity of the National Footprint Accounts are dependent upon the level of accuracy and availability of a wide range of datasets, many of which have incomplete coverage, and most of which do not specify confidence limits. Considerable care is taken to minimize any data inaccuracies or calculation errors that might distort the National Footprint Accounts, including inviting national governments to collaboratively review the assessment of their country for accuracy. Improvements from one edition to the next may result in slight discrepancies between the numbers published in earlier versions and the current one (2011 edition). The most significant changes for this version are the following:

#### 1. Changes in the source data

The calculation of the Ecological Footprint and biocapacity for each land type and each country is based on the collection and analysis of a large body of data, sourced primarily from the United Nations (for more information on data sources, see the Methodology paper). When there are significant changes in the data

over time, those changes will be reflected in the new results. Raw data for the entire time series tracked by each Edition of the National Footprint Accounts is collected anew each year, so adjustments in historical figures will affect results for previous years. Source data change reflects the real change in numbers between 2007 and 2008. Source data revision is when the data provider altered the numbers in an update for the same year. Occasionally there may be irregularities in data that are published by an agency, and while there is some limited scope to make corrections in the National Footprint Accounts; data irregularities is an issue that should be addressed with the data collecting organization. As well as data updates and small irregularities, there are also annual differences in data due to changes in consumption patterns across nations.

## **2. Calculation Improvements and Corrections**

The National Footprint Accounts calculation is continually improving as Global Footprint Network seeks to increase the resolution and detail of the data that is included, updates and improves the way the calculations are done, and makes corrections when necessary from previous Editions of the National Footprint Accounts.

### Data cleaning algorithm

One specific update in the calculation is an amendment in the statistical algorithm that is used to ensure that obvious irregularities in the raw data are corrected, and to enable gaps in the raw data to be populated appropriately with values that are consistent with what is already reported.

### Template improvements

The Excel template and the data querying program used for the National Footprint Accounts calculations are also a site of amendment in the annual process. Changes in these elements might affect results because of increased data detail being incorporated, improved allocation of some elements of a Footprint, corrections, or updates in the calculations themselves.

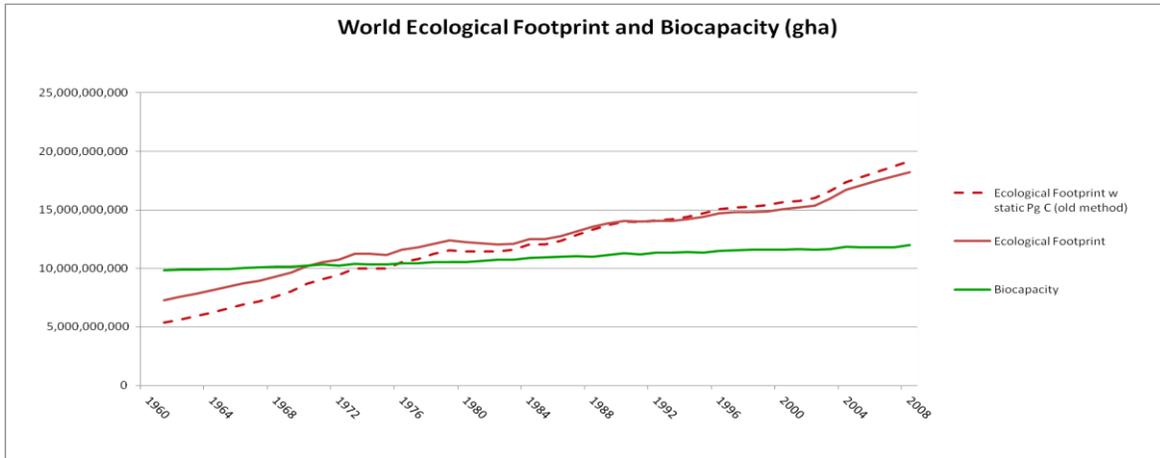
## **3. Methodological refinement**

The methodology, which is the foundation of the National Footprint Account calculation process, is under continual research and review for potential improvements as Global Footprint Network strives to make this indicator increasingly precise, and to incorporate the latest relevant scientific research. After a formal process with the National Accounts Review Committee, two changes were incorporated into the underlying methodology for the NFAs 2011 that affect some results:

### Ocean sequestration of CO<sub>2</sub>

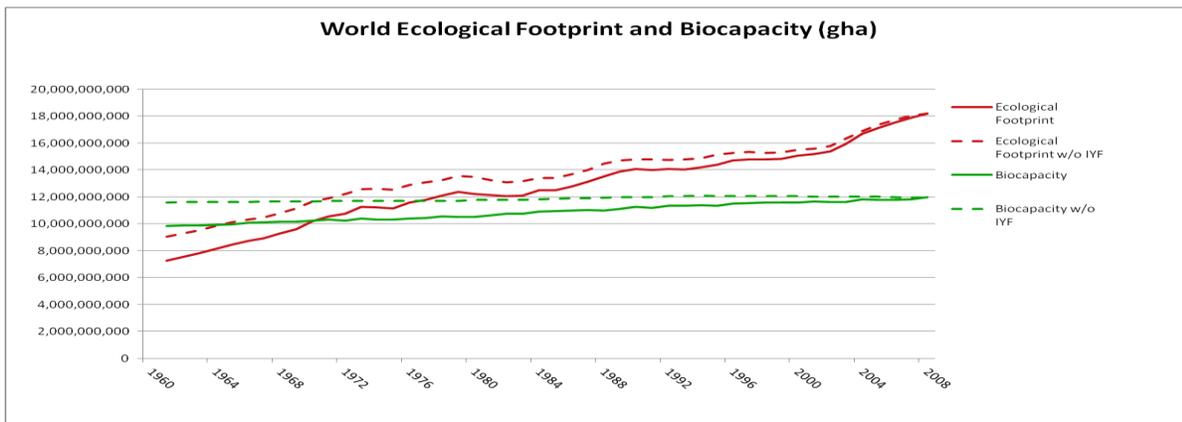
Recent research has provided more detailed information quantifying the changing capacity of the ocean to absorb a proportion of the CO<sub>2</sub> emitted into the atmosphere by human activity (anthropogenic emissions) over time. The ocean sequestration calculation within the NFA 2011 edition has been updated to include the recent peer-reviewed results published in this field (method paper). These results show a more consistent, flatter downward trend in the percentage

of anthropogenic emissions sequestered by the ocean over time. This change is most apparent in an increased World Ecological Footprint from 1961 to early 1990s. This modification has also caused a shift backwards several years in the calculation of when humanity entered ecological overshoot.



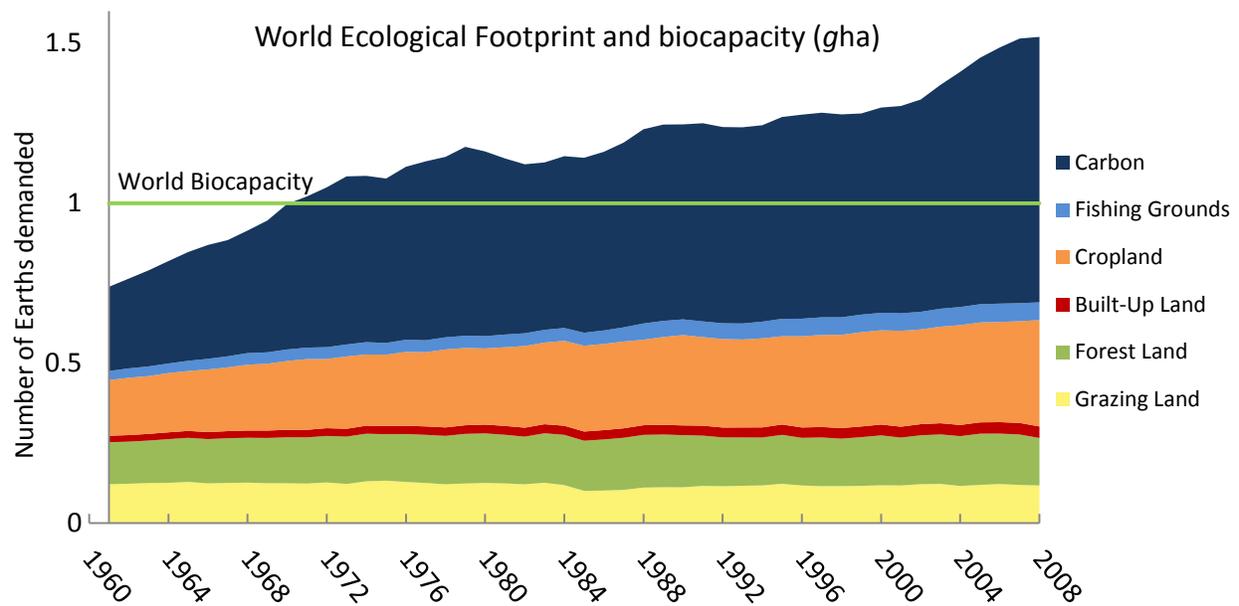
Constant gha

In order to incorporate changes in bioproductivity yield (i.e. the amount of bioproductivity per unit of area) over time, an Intertemporal Yield Factor (IYF) was introduced into the NFA calculation. This improvement allows for a clearer interpretation in intertemporal comparisons of Ecological Footprint and Biocapacity results. The IYF sets the most recent data year as 1, and provides an average world yield for each land type per year as a proportion in relation to the most recent year. These numbers are calculated from production quantity and yield data. Based on the limited availability of this kind of data, the IYF is currently only implemented for cropland. The implementation of this methodological change increases the slope of both Ecological Footprint and biocapacity results over time, increasingly lowering the values for each as the years go back. This is a reflection of crop yields being lower in the past.



## KEY FINDINGS OF THE NATIONAL FOOTPRINT ACCOUNTS, 2011 EDITION

According to the most recent National Accounts for the year 2008, the total Earth's biocapacity is estimated at 12 billion gha (or 1.8 gha per person) but humanity's Ecological Footprint has reached 18.2 billion gha (or 2.7 gha per person). Correspondingly, the number of planets demanded by all humans has increased to 1.52 planets, which represents an increment of 2.5 times the demand for nature's renewable resources since 1961.



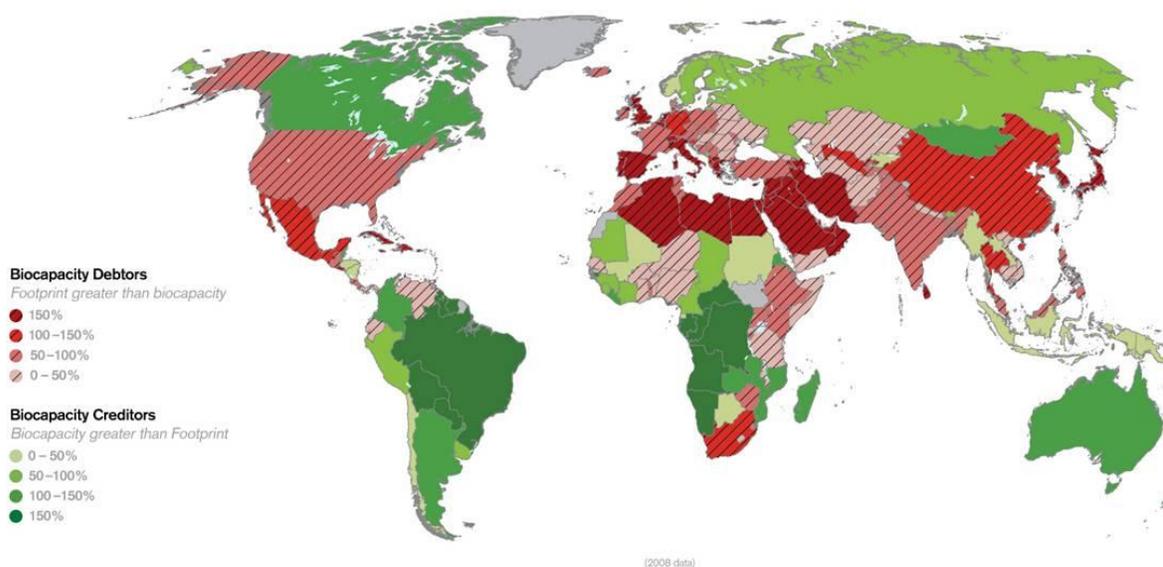
## Country Data:

Detailed data for the year 2008 (the most current year in which global data is available), can be found in National Footprint Accounts tables Ecological Footprint and the biocapacity results for almost 150 nations can be found in the 2011 Data Tables. These tables can be downloaded at:

[http://www.footprintnetwork.org/en/index.php/GFN/page/footprint\\_data\\_and\\_results/](http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_data_and_results/). These tables summarize the Ecological Footprint and Biocapacity in 2008 for the countries included in the analysis. The data is broken down by major geographical regions. For each country, information on population, income group, and Ecological Footprint and biocapacity expressed in number of gha per capita are indicated. Ecological Footprint and Biocapacity data are further broken down by land use type. The final column indicates if a particular country (or region) incurs a biocapacity deficit or has a biocapacity reserve.

## The Ecological Wealth of Nations

As global ecological overshoot grows, how will countries continue to meet the needs of their people and their economies? Maintaining natural wealth and reducing ecological demand will help countries improve economic resilience and human well-being.



Individual country trends of Ecological Footprint and Biocapacity from 1961 to 2008 can be accessed at Global Footprint Network's website at:

[http://www.footprintnetwork.org/en/index.php/GFN/page/footprint\\_data\\_and\\_results/](http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_data_and_results/)

Most countries are accompanied with an individual "country fact sheet" comparing basic differences between the results of the National Accounts 2010 edition (year 2007) and the National Accounts 2011 edition (year 2008). These factsheets highlight the major changes in the Ecological Footprint and Biocapacity figures per capita between editions for all major land types, including a brief explanation for the differences when available.

## Summary of Resources for the National Footprint Accounts, 2011 Edition:

### Calculation Methodology Paper, 2011 edition:

[http://www.footprintnetwork.org/images/article\\_uploads/Global\\_Footprint\\_Network\\_Method\\_paper\\_NFA\\_2011\\_-\\_Draft.pdf](http://www.footprintnetwork.org/images/article_uploads/Global_Footprint_Network_Method_paper_NFA_2011_-_Draft.pdf)

(This is a draft copy of the methodology paper sent for publication)

### Data Tables for the National Footprint Accounts, 2011 edition:

[http://www.footprintnetwork.org/images/uploads/Data\\_Tables\\_2011\\_NFA-National\\_Results\\_and\\_Global\\_Time\\_Series\\_2012.xls](http://www.footprintnetwork.org/images/uploads/Data_Tables_2011_NFA-National_Results_and_Global_Time_Series_2012.xls)

**Country Trend Graphs, 2011 edition** (tracking per-person resource demand (Ecological Footprint) and resource supply (Biocapacity) since 1961:

[http://www.footprintnetwork.org/en/index.php/GFN/page/footprint\\_data\\_and\\_results/](http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_data_and_results/)

### Additional Resources:

The **Guidebook to the 2008 National Footprint Accounts** describes the implementation of the Ecological Footprint methodology as presented in the 2008 edition for the National Footprint Accounts. It provides an in depth description of each part of the 2008 NFA workbook, along with detailed descriptions of calculations and data sources. (An updated version for the 2011 edition is coming soon.)

<http://www.footprintnetwork.org/download.php?id=507>

The **Ecological Footprint Atlas 2010** explains the purpose behind Ecological Footprint Analysis, the research question it addresses, basic concepts and science underlying the Accounts, and the also expands on the method used for calculating the results. It describes ways Ecological Footprint Analysis is currently being applied in a variety of domains. For the technical reader, the Atlas includes more detailed notes about calculation of the results, explains recent advances to enhance the consistency, reliability and resolution of the National Footprint Accounts, and reviews the evolution of the National Footprint Accounts methodology. (An updated edition of the Ecological Footprint Atlas for 2012 also will be available soon.)

[http://www.footprintnetwork.org/images/uploads/Ecological\\_Footprint\\_Atlas\\_2010.pdf](http://www.footprintnetwork.org/images/uploads/Ecological_Footprint_Atlas_2010.pdf)