Securing Human Well-being within the Means of Nature:

Mathis Wackernagel, Ph.D.
GEN, January 30, 2013
Results: Changes in ranking for CO2 per capita emissions (20% prob. of exceeding 2°C)
Ecological Creditors and Ecological Debtors – 1961
Ecological Creditors and Ecological Debtors – 2008

Global Footprint = 1.5

Global Biocapacity
Rare Earths?  

Fossil Fuel?  

5X  Move out of fossil?  

1700 ppm?  

Biocapacity!  

The Food-Water-Energy Nexus
Framing question:

What do you need to know in order to operate TURKEY safely?

Global Footprint Network
Advancing the Science of Sustainability
Dilemma:

Sustainable
How many resources does it take compared to what we have? Footprint?

↔

Development
How well do we live? HDI?
Measuring “sustainable development”
The Ecological Footprint

Global Footprint Network
Advancing the Science of Sustainability

FOREST land
GRAZING land
URBAN land
FISHING grounds
CROP land
CARBON footprint
Accounting Framework for Ecosystem Services

**Biocapacity:**
How much bioproductive area is available to us?

**Ecological Footprint:**
How much bioproductive area do we demand?
The Basic Equation

Yield = \frac{\text{Amount per year}}{\text{Area}}
The Basic Equation

Amount per year

\[ \text{Area} = \frac{\text{Yield}}{} \]

Translate area from ha into global ha…
Measurement Unit: **global hectare**

- Half as productive as world average
  - \( \frac{1}{2} \text{ gha} \) → **1 ha**

- Double as productive as world average
  - **2 gha** → **1 ha**
LIMITATIONS

1. Only 7000 data points per country and year, UN statistics, SEEA compatible

2. Necessary, not sufficient condition for lasting success (only one criterion)

3. Natural capital components have different dynamics

4. Accuracy to be further improved – underestimates biocapacity deficit

5. Only measures biocapacity, not depletion of stocks.
Measuring “sustainable development”
Measuring “sustainable development”

- Conventional belief (palliative)
- Transformative path
- Collapse
- Sustainable (fits on one planet?)

HDI

Global Footprint Network
Advancing the Science of Sustainability
Ecological Footprint per person

Biocapacity per person

Biocapacity deficit per person
Composition of Italy’s Biocapacity Deficit

Ecological Footprint per person

Biocapacity per person

Italy

Global hectares per capita


Fishing_ground
Forest_land
Grazing_land
Cropland
Carbon
Biocapacity Deficit

World Commodity Prices

Cost of Biocapacity Deficit
Ecological Creditors and Ecological Debtors in Europe

Ecological Footprint and Biocapacity PER CAPITA, 1961-2005
Biocapacity

Shrinking Biocapacity Credit

Increasing Ecological and Social Instability

Ecological Footprint
New principles for success

• Nature has a budget. Do you know how much biocapacity you have? and how much you use?

• Biocapacity is the currency of the 21st century. Key to prosperity.

• Self-interest for countries, cities to reduce their resource deficit is overwhelming.

• How does development work within the resource constraints of ecosystems?

mathis@footprintnetwork.org
What happens when an infinite-growth economy runs into a finite planet?
Debt boils over.
The majority is left out.
Biodiversity is for sale.
Ecological Creditors and Ecological Debtors in Africa

Ecological Footprint and Biocapacity PER CAPITA, 1961-2005
WHAT WE WILL COVER

1. How do we measure the Footprint?
2. What do we need to know to operate safely?
3. Why does it matter to nations?
4. With whom do we work?
5. How do we know we are making progress? (SDROI)
WHAT WE WILL COVER

1. How do we measure the Footprint?
2. What do we need to know to operate safely?
3. Why does it matter to nations?
4. With whom do we work?
5. How do we know we are making progress? (SDROI)
What is the Goal? Are we managing against it?

The Goal of International Development: Alleviating Poverty – in a transformational, not palliative way. We want results to last.

If we managed against this goal, the key performance indicator ought to be: How much transformational poverty alleviation are we generating per dollar international development?

This is what **SDROI***) measures.

*) Sustainable Development Return on Investment
Framing question:

What do you need to know in order to operate TURKEY safely?
Dilemma:

Sustainable
How many resources does it take compared to what we have?
Footprint?

Development
How well do we live?
HDI?
WHAT WE WILL COVER

1. How do we measure the Footprint?
2. What do we need to know to operate safely?
3. Why does it matter to nations?
4. With whom do we work?
5. How do we know we are making progress? (SDROI)
Existing official national gov Footprint studies

In discussion with national govs

WBCSD
UNDP
EP and EC
UNEP Green Econ.
SEEA
WHAT WE WILL COVER

1. How do we measure the Footprint?
2. What do we need to know to operate safely?
3. Why does it matter to nations?
4. With whom do we work?
5. How do we know we are making progress? (SDROI)
Human Development: Making Development Last

150 b$ per year from OECD countries

How much lasting poverty alleviation do you generate per dollar investment?
Measuring “sustainable development”

Global average available biocapacity per person. (This must also include the needs of wild species.)

Threshold for very high human development

Threshold for high human development

Sustainable Development Quadrant

HUMAN DEVELOPMENT INDEX

North America
Europe
Latin America & Caribbean
Asia
Oceania
Africa

Global Footprint Network
Advancing the Science of Sustainability
Our Mission

Our Mission is to end ecological overshoot by making ecological limits central to decision making. By institutionalizing resource accounting in national governments, Global Footprint Network influences major investments and policy shifts to support global sustainability.
Our Programs

• Human Development Initiative
• Environmental Policy
• Competitiveness 2.0
• Finance Initiative
WHAT WE WILL COVER

1. How do we measure the Footprint?
2. What do we need to know to operate safely?
3. Why does it matter to nations?
4. With whom do we work?
5. How do we know we are making progress? (SDROI)
Biocapacity/Footprint

Current position

HDI
HDI

SD path

Biocapacity/Footprint

worst

1

best

SD path

HDI

1
Biocapacity/Footprint vs. HDI

- **Best**
- **Worst**

**Mitigation**

**P1**
SDROI = $\frac{\Delta \text{ HDI} \times \text{ pop}}{\text{Inv} + \text{Mit}}$
SDROI (in $\Delta$HDI*pop/$$)

Threshold for minimal SDRoi effectiveness

Project G.
Project D.
Project F.
Project A.
Project R.
Project B.
Project C.
Resilience

Diversity and Redundancy

Modular Networks,

Responsive, Regulatory Feedbacks

Biocapacity/Footprint:
   Enough resources,
   HDI – outcome - enough social capital
MEDITERRANEAN ECOLOGICAL FOOTPRINT TRENDS

Why are resource limits now undermining economic performance?

www.footprintnetwork.org/med
Finance Initiative: Safeguarding Investments

What’s the evidence that resource constraints materially and substantively affect economic performance?
Competitiveness 2.0: Helping Nations Succeed

What do these Footprint and Biocapacity trends mean for your competitiveness?
Environmental Policy: Bringing Limits into Policy

NGOs, education, environment ministries

What do these Footprint and Biocapacity trends mean for your competitiveness?
Biocapacity per person

Ecological Footprint per person

Colombia