

The Ecological Footprint

MEASURES

how fast we consume resources and generate waste



Energy



Settlement



Timber & paper



Food & fibre



Seafood

COMPARED TO

how fast nature can absorb our waste and generate new resources.



Carbon Footprint

Built-up land



Forest

Cropland & pasture



Fisheries

We Depend on Nature

- We exchange energy and matter with our environment as we
 - Eat
 - Drink
 - Breathe
- We use
 - Energy for heat and mobility
 - Wood for housing and paper
 - Food and water for living



We Depend on Nature



- Nature
 - Absorbs our wastes
 - Provides climate stability
 - Protects us from ultraviolet radiation
- In cities we tend to think of nature as a collection of commodities we obtain from around the world
- But nature is the very source of our lives and well being

Ecological Footprints



- The amount of ecologically productive land used by individuals, cities, countries, etc.
- Production and use of goods and services involve land use: have ecological footprints
- Made up of several parts

Energy Land – fossil fuel consumption requires CO₂ sink



Consumed Land – built environment



Farm Land – food production



Forest Land – products for economy



Transportation Footprints



- If one person travels 3 miles twice each workday, the following amount of space would be needed for roads:
 - **Bicycle: 122 sq meters**
 - **Buses : 301 sq meters**
 - **Cars: 1,442 sq meters**

Agricultural Footprints

- Open Field production of tomatoes takes up more land than greenhouse production
- But Greenhouse production has a much larger ecological footprint (10-20x)
 - Energy
 - Fertilizer
 - Other inputs



Urban Footprints

Imagine New York City covered by a bubble

- Most people would die within a few days
- Cities depend on much greater amount of land, environment for vitality



<http://antwrp.gsfc.nasa.gov/apod/ap>

Urban Footprints



- Now imagine how big that bubble would have to be for the city to be ***self-sustaining***
- This is the ecological footprint of the city
- Actually 347,000 square miles
 - to support 20 million in U.S. lifestyle
 - size of Texas and Oklahoma combined.

National Footprints

- Holland population 15 million
- Density = 4.4 People per Hectare
- Consumption is less than in U.S.
- Still, Dutch people require 15x more land than is within their country for
 - Food
 - Forest Products
 - Energy Use
- Therefore, the ecosystems that support Holland lie far beyond their national borders



National Footprints

- In U.S. each person uses about 11 acres
- Worldwide average = 3.7 acres/person
- Therefore if everybody were to adopt the U.S. consumptive style, we would need 4-5 planets



Country	Number of planets needed to sustain whole world at that level of national consumption
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US	
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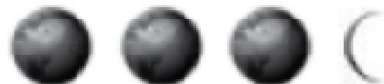
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France	
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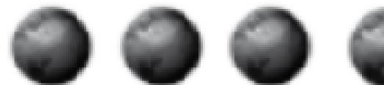
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UK	
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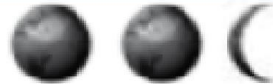
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Spain	
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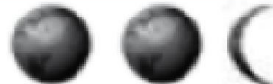
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Germany	
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2.2

Japan	
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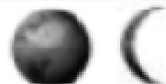
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Italy	
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2.7

China	
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1.2

India	
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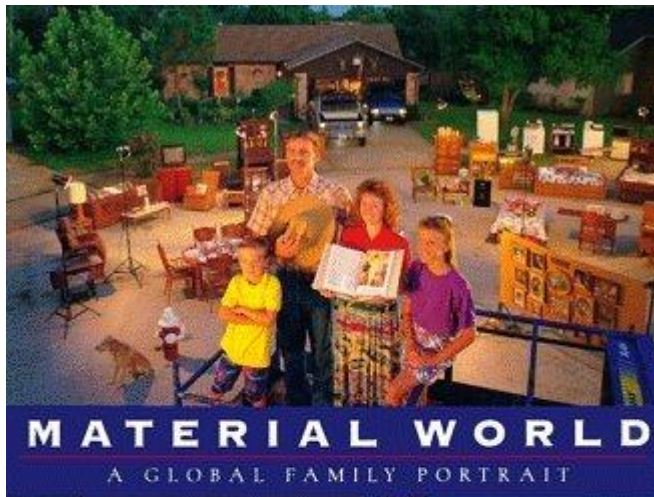
0.5

Malawi	
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0.3

Inequity



- We all compete for an ecologically overloaded world
- Excess consumption by well off countries takes up ecological footprint that would be used by poorer nations



http://www.thesavvytraveler.com/agaphies/insights/geography/General/photoessays/dalusio_menzel/material_world.jpg

Weekly food shop for
an average German
family. \$500



USA : \$346 per week





Chad : \$1.62 per week

Resource Distribution



Wealthiest 25% of the world uses 75% of the world's resources

- If four people landed on an island, they could divide the land up into 4 equal sections and trade goods.
- Is it fair if one of those people claims $\frac{3}{4}$ of the land, forcing the other 3 to live off of $\frac{1}{4}$ of the land?

Can everyone live like we do?



No. There is not enough earth to support it

- Thus all poor countries cannot follow the miracle of developed countries
- Someone must bear the ecological burden of consumption by the affluent
- Our continued over-consumption hits the poor hardest

THE PROBLEM:

- OVER CONSUMPTION
 - Live within your means
- POPULATION EXPLOSION
 - Society already reducing numbers as awareness increases

Your personal choices impacts the availability of natural resources , environmental quality, and global equity!