

# **Ecological Footprints of Nations**

**Mathis Wackernagel, Larry Onisto, Alejandro Callejas Linares,  
Ina Susana Lopez Falfan, Jesus Mendex Garcia, Ana Isabel Suarez Guerrero,  
Maria Guadalupe Suarez Guerrero - Center for Sustainability Studies**

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*Ecological footprint: the biologically-productive area required to continuously provide resource supplies and absorb wastes of a particular population given prevailing technology.*

*Though nations use discontinuous and scattered areas due to international trade, calculations can be made by computing ecological-services consumption and then calculating the necessary area (at world average productivity) to provide these services.*

*A series of compatible approaches to calculating carrying capacity, from energy-flow to ecological space to footprint, have been developed, but are largely "compatible" and therefore synergistically strengthen each other in formulating appropriate sustainability tools.*

## **Planetary Biological Productivity: Land**

- *Fossil energy land: valuable CO<sub>2</sub>-absorption capacity being foregone in favor of unreplenished fossil-fuel use and generation of unsustainable waste products/pollutants.*
- *Arable: 1.35 billion ha under cultivation, but 10 million/year abandoned due to degradation.*
- *Pasture: less productive, and plant-animal conversion efficiencies reduce biomass energy potential by a factor of ten; also encroaches on valuable forest land.*
- *Forest: secure a huge range of ecological services, but productivity is decreasing.*
- *Built-up areas: because they occupy the most fertile areas, these lead to a loss of arable land.*
- *Oceans: though large areas, these have generated limited food gains despite high harvesting.*

*Considering available resources according to this division, we arrive at an ecological benchmark figure of 1.7 ha. of land per capita for comparing ecological footprints; it is to this figure that human use of biologically-productive space must be reduced.*

*It is worth noting that the report does not cover the use of fresh water (often diverted from ecosystem to artificial uses at high energy and environmental costs), or contamination (capable of significantly reducing productivity); thus, the present study is an underestimate of human uses.*

## **Results**

- *In only 10 out of 52 surveyed countries is the ecological footprint less than 1.7 ha/person.*
- *Many countries have a higher productive capacity than 1.7; the report takes this into account in formulating its "ecological deficit": degree to which footprints exceed capacity.*
- *While several nations are running surpluses, the predominance of export trade means that this extra capacity is in many cases used up.*
- *A comparison of deficits and surpluses shows an average ecological footprint of 2.3, more than 35% larger than current available space.*
- *Footprint numbers, while clearly illustrating problems facing sustainability, also*

indicate an equity problem in that industrialized countries' current resource use requires drastic under use by Southern populations. Moreover, it is clear that over consumption, not poverty, is the threat to sustainable development.

- An additional issue is the quality of life obtainable by living on 1.7 hectares of capacity; case studies, experiments, and even international competitions should be developed to highlight this issue.

### *Implications for Measuring Sustainable Development*

- *Time-series.* As with economic indicators, time-series footprint studies can provide progress reports, can show the benefits and pitfalls of previous practices, and, via historical analysis, can illuminate the effects of economic/demographic growth on ecological footprints.
- *National accounts.* The ecological footprint systems approach allows quantification for national accounts purposes, which can allow inter-sectoral planning and identification of the risks and opportunities to conserve natural capital in favor of potential future interests.

### ***Implications for Political Mobilization***

- *Deflects confusion as to the meaning of "sustainable development" by helping to refocus public attention through presentation of clear and measurable objectives;*
- *Acts as a measurement tool to inform government, business, and NGO environmental assessments and policy impact studies;*
- *Yields positive and accessible information by clarifying impacts of a proposed action in terms of "perceivable ecological units," thereby allowing the public to generate more informed opinions on actions with a positive or negative environmental impact; and*
- *Sharpens our understanding of biodiversity's significance to human survival, yields an overall picture of man's impact on the planet, and thereby allows exploration of the denial mechanisms which currently hinder public action on environmental issues.*

### ***Implications for the Business & Economics Status Quo***

- *Enhances economic analyses by injecting issues of resource throughput and scale into monetary assessments, internalizing environmental costs into economic analyses of resource distribution and supposed "efficiency," and by re-adjusting GDP to incorporate environmental degradation and thereby redefine the issue of "world competitiveness";*
- *Informs trade policy, which is currently lagging far behind Agenda 21 mandates;*
- *And redefines wealth and scarcity by incorporating the ecological footprint studies' measurements of natural capital and its potential interests into standard economic welfare gains measurements, thereby encouraging*
- *Development of alternative solutions to reduce ecological footprints, which creates the potential for competitive advantage determination vis-a-vis sustainability, encourages ethical investment in sustainability, and drives business to create efficient solutions for the achievement of sustainability.*