



Lomonosov Moscow State University
Business School

Global Limits of Economic Growth

*Lomonosov Moscow State University,
Inter-Departmental Course, 2024-2025, Spring Fall*

Course Reader:

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Go through the 1st SURVEY on sustainable-oriented activities *(it's one time activity, no need to repeat it if you have done it during sessions 1 or 2)*

What do you think about sustainability?

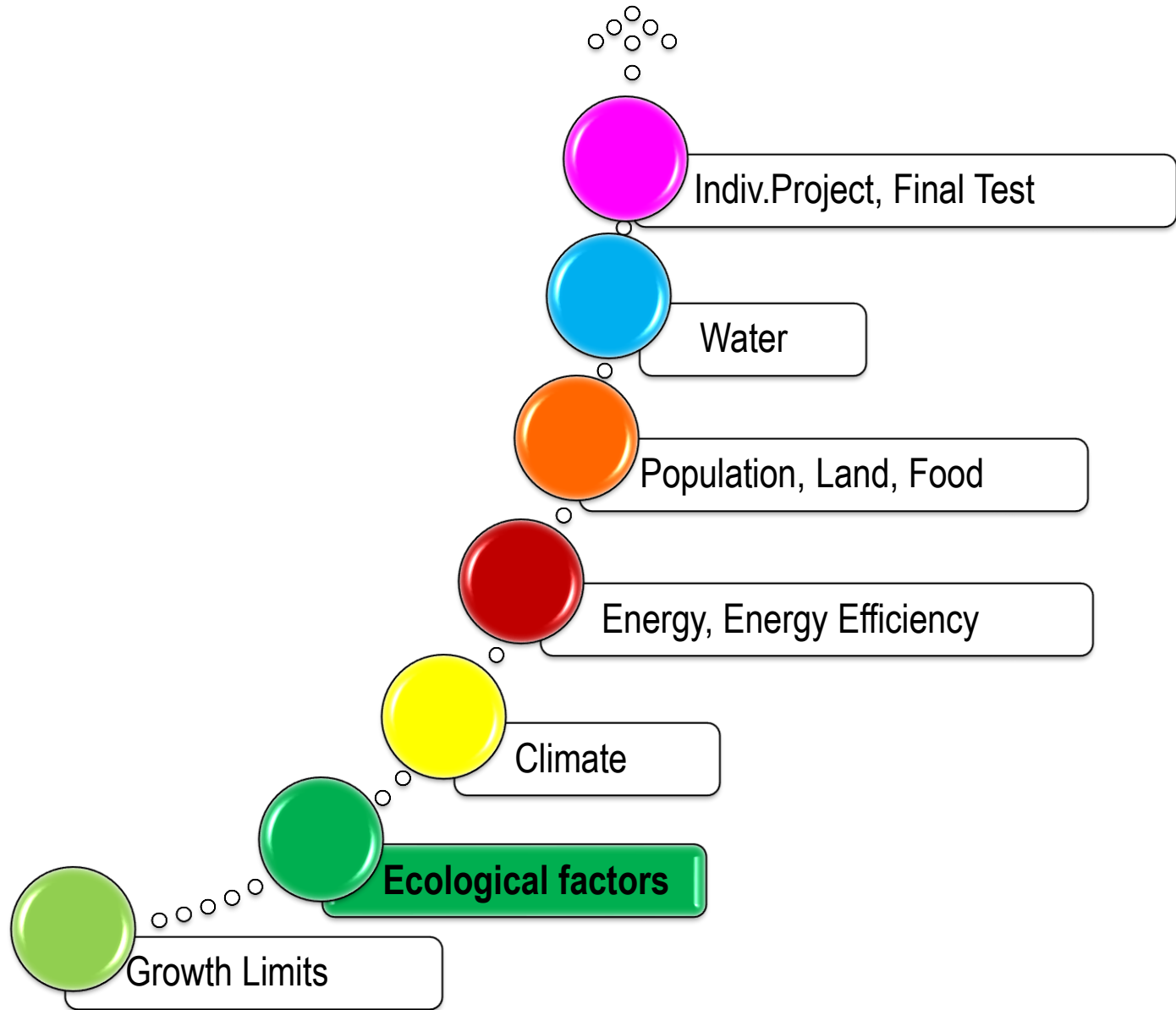
This is the survey about your opinions on sustainability-related issues. By sustainability-related issues we understand the complex of umbrella concepts like Sustainable Development, Green Economy and Circular Economy.

Please answer the questions as honestly as possible, in a way that shows what you really think or feel at the moment.

- We ask your name just for processing the results. It will be coded and used for technical purposes only. No personal data will be disclosed or shared in any way.
- 2 times survey: at the beginning of the course + at the end
- Follow the link: <https://forms.gle/vVYUHJSQvvFtAuANA>
- Put your real name!
- Up to 5-7 min. to complete the survey



Course Route



Session 2

Global Ecological Problems

26.02.2025

Aims of Session 2

1. To develop basic understanding how financial evaluation of ecological damages is made
2. To analyze Disaster Risk Management Systems and understand their basic elements
3. To get closer to the concept of Ecological Footprint and take this concept critically
4. To know specifics among different instruments of Business Environmental Responsibility (environmental standards, ecoratings, ESG ratings)

Session 2. Global Ecological Problems

1. Global Ecological Problems: Causes, Effects, Solutions.
2. Disaster Risk Management approach
3. Financial Evaluation of Ecological Damages
4. Environment Risk Management
5. Ecological Footprint Concept
6. Public Environmental Policy, International Environment Management Standards
7. Business Environmental Responsibility (Ecoratings, ESG-ratings),



- What kind of problems can be called



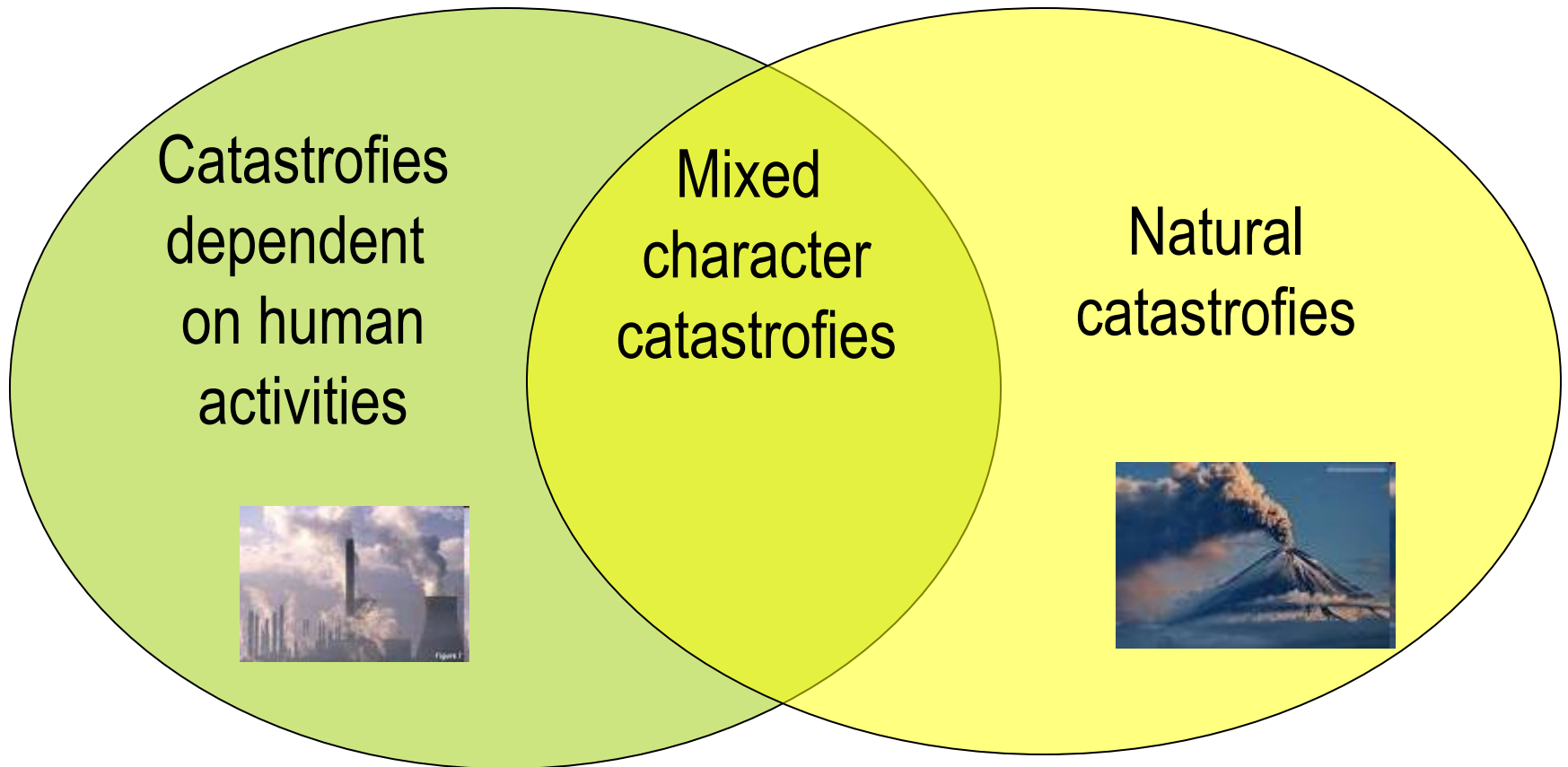
GLOBAL PROBLEMS?



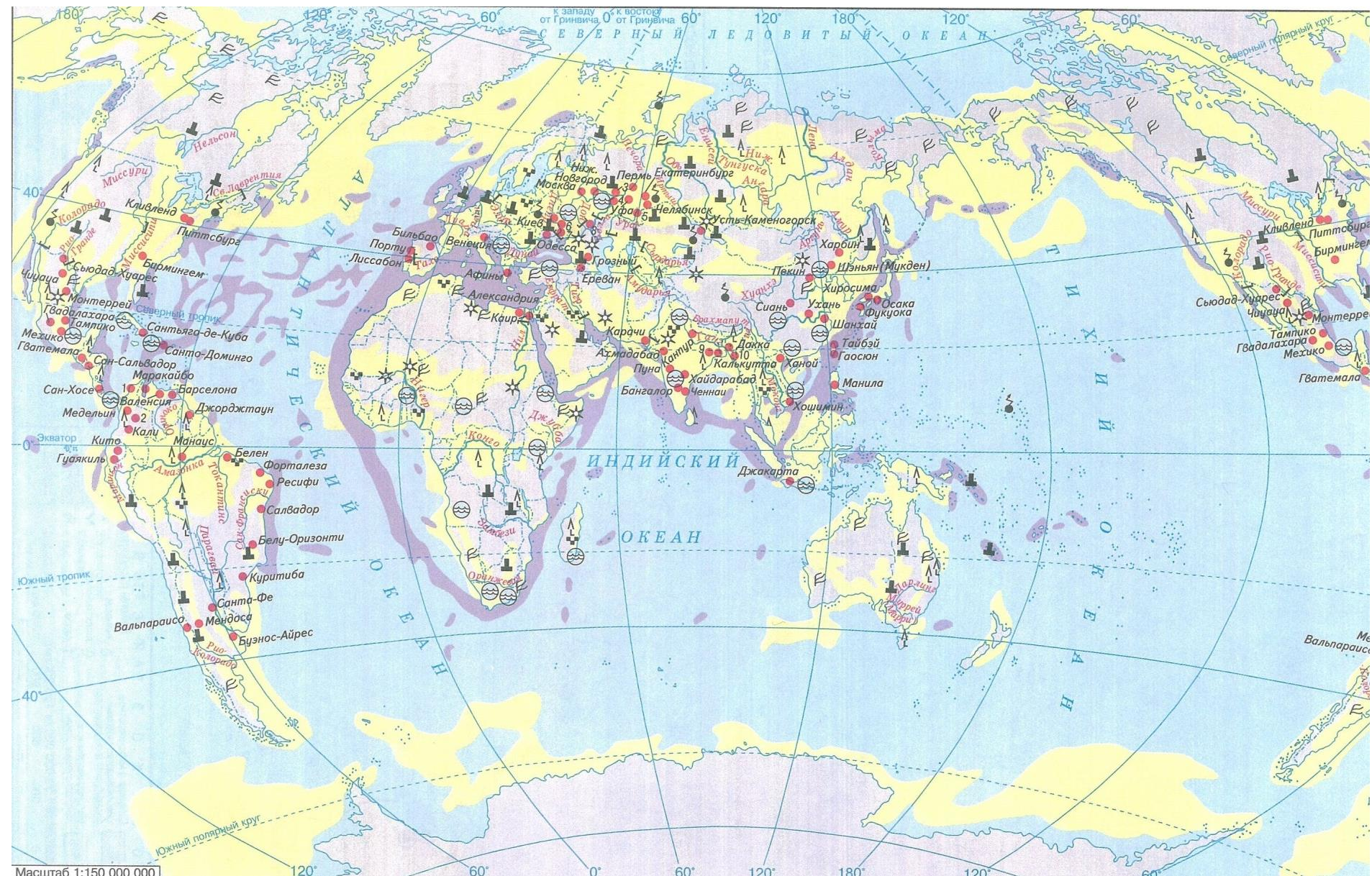
Global Ecological Problems

- **Global** problems
 - World Scale
 - Joint action needed
- **Ecological** problems \approx **environmental** problems
 - Types: climate change, all sorts of pollution, deforestation, biodiversity loss, draughts and desertification, water scarcity, floodings, etc.
 - Interconnection between ecological problems have made them multidimensional
- **Global Ecological** problems \rightarrow **global environmental disaster...**


Global Ecological Problems



World Ecological Problems



Environmental Risks and Their Impact

	Risk Description	Global impact
Droughts and desertification 	Increased frequency and severity of heatwaves and droughts and the spread of desertification	<ul style="list-style-type: none"> • Reduction of agricultural yields around the world • Increase in economic losses • Inefficient use of land resources • Change in weather patterns • Migration (displacement) of human populations • Concentration of populations in regions with access to water • Competition for scarce resources • Biodiversity loss • Further damage to the environment
Air pollution		
Water Scarcity		
Nat.Cat.: Earthquake		



Natural Catastrophies: Earthquake

- **Risk Description**

- A strong earthquake hits an economic centre or densely populated area such as Tokyo, Los Angeles, San Francisco, Beijing or Mumbai

- **Global impact**

- Tremendous economic loss and loss of life
- Displacement and rehabilitation of people
- Destruction of infrastructure
- Infrastructure losses
- Investment in rebuilding the infrastructure

Air Pollution

- **Risk Description**

-

- **Global impact**

- ...





Water Scarcity

- **Risk Description**

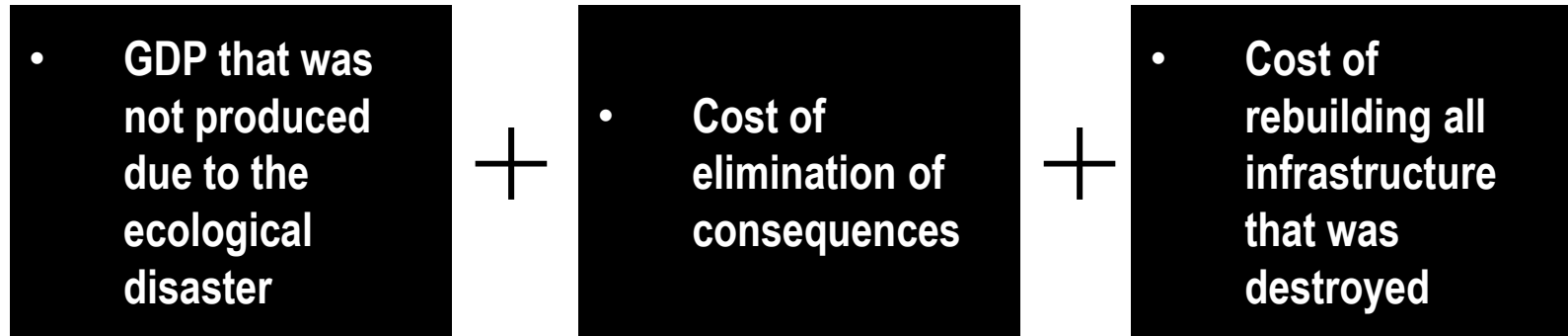
- ...

- **Global impact ..**

- ...

Evaluating Ecological Damages

Evaluation of the ecological damage is composed of the following basic elements:



Other aspects can also be covered:

1. insurance payments
2. following increase of GDP (recoil effect) / *Till certain scale of catastrophe/*

- **Direct losses** are losses of assets
- **Indirect losses** are the losses that accrue while productive assets remain damaged or destroyed. (Natural Disaster Hotspots A Global Risk Analysis, WB. 2005)

Leading natural disasters, by overall economic losses, since 1980



Disaster risk management (WDR)

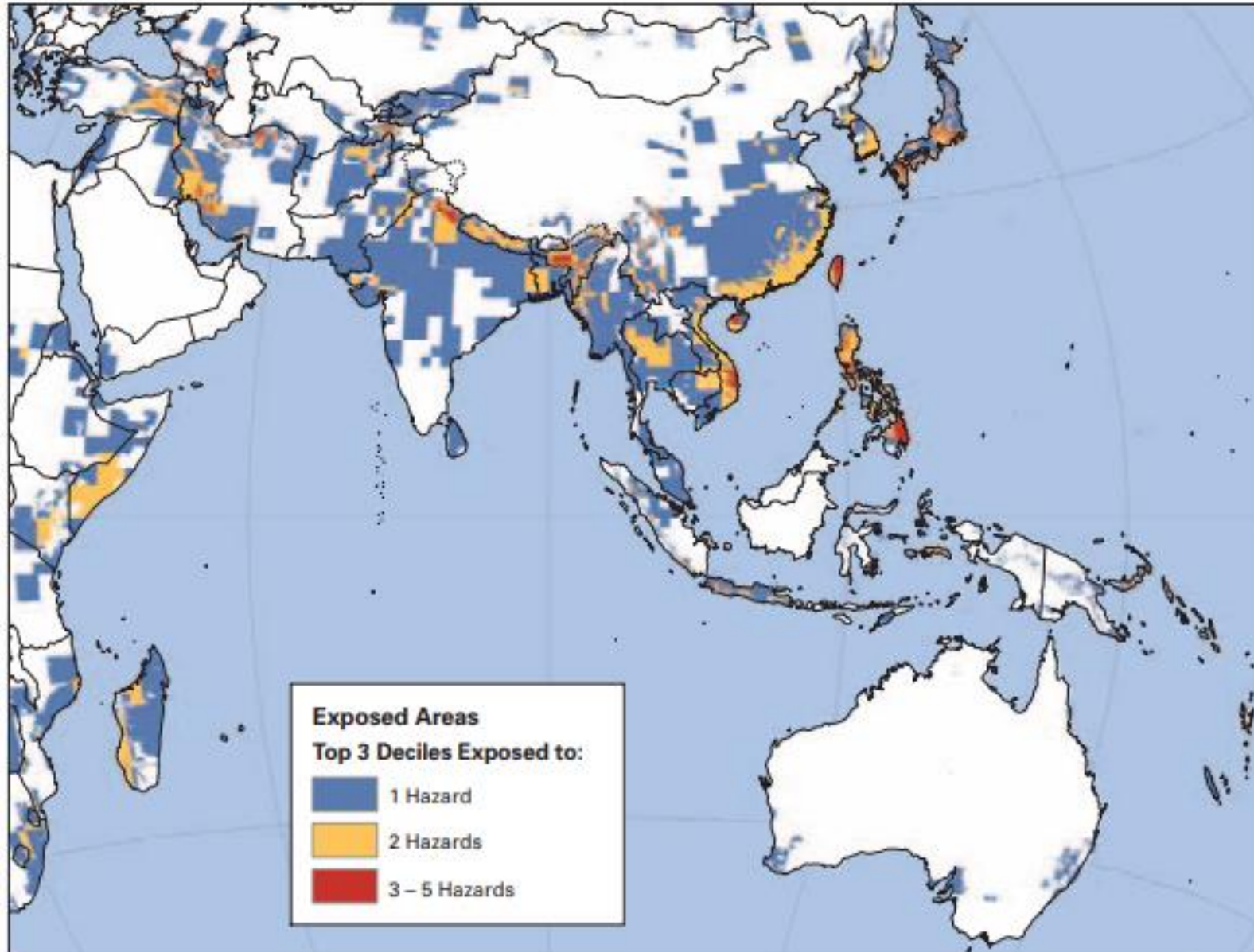
- Preparing for the unexpected: **An integrated approach to disaster risk management** in the Philippines and Colombia

Philippines

- What kind of shift did occur in **DISASTER RISK MANAGEMENT (DRM)** system after 2010?
- What are the peculiarities of DRM system of Philippines?



Figure 5.2. Detailed View of Multihazard Areas
b) Asia/Pacific



- Preparing for the unexpected:
An integrated approach to disaster risk management in the Philippines and Colombia

Colombia

- What are the peculiarities of DRM system of Colombia?
- What is the role of local government in Colombian DRM system?

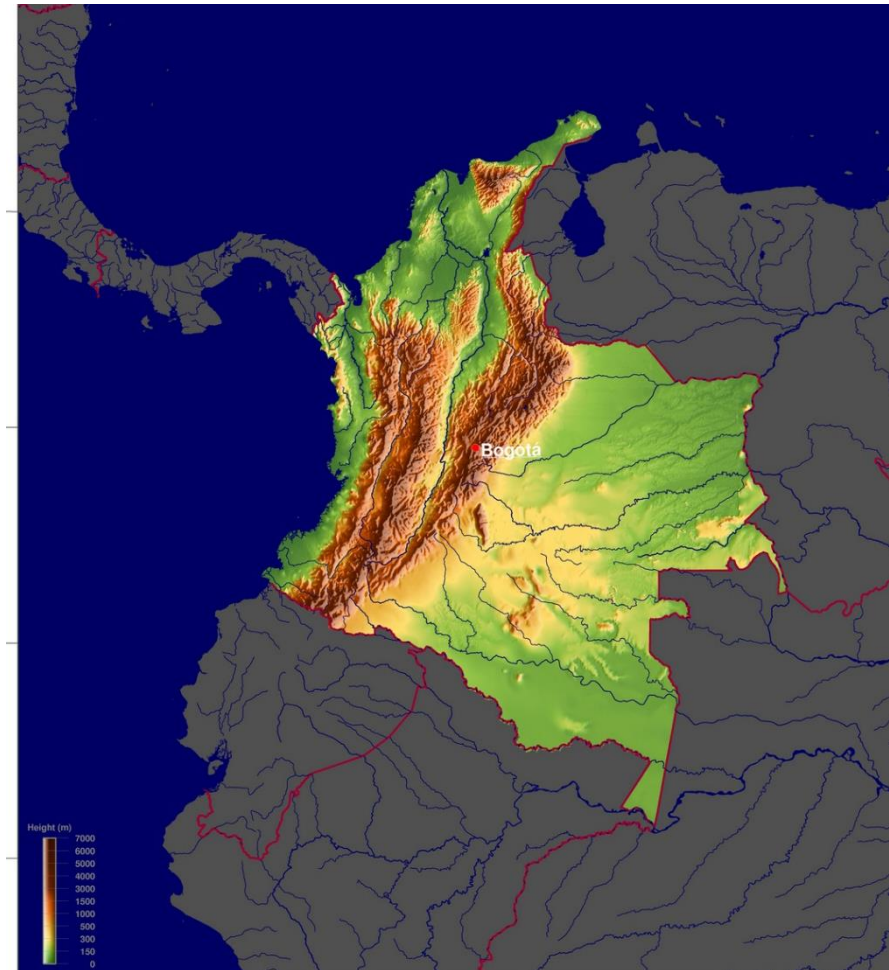
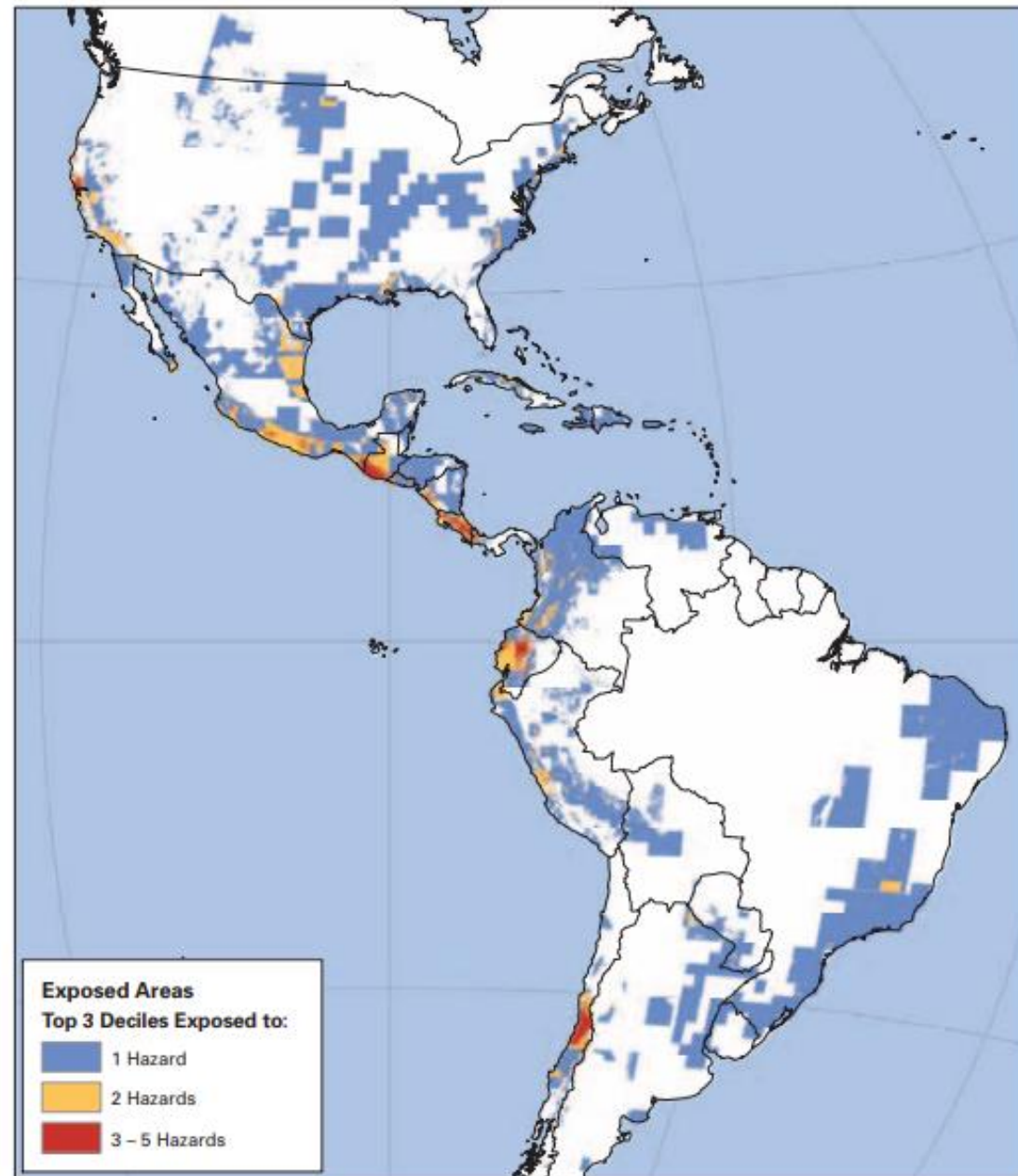


Figure 5.2. Detailed View of Multihazard Areas
a) Western Hemisphere



How to minimize the consequences of disasters

- **What should be done by actors on different levels in order to minimize the consequences of disasters?**

By National Governments

- Stronger regulation over private individuals and firms
- Optimizing their policies: discouraging people to live in dangerous areas
- More prevention measures
 - insurance, education
 - land use regulation
- Multistakeholder composition of DRM system

By Private Companies

- Companies need to operate on the assumption that a disaster will strike at some point (Murphy's law) and follow the national government's policies in DRM

**DISASTERS ARE INEVITABLE,
BUT THEIR CONSEQUENCES NEED NOT BE**

Ecological Footprint Concept

What does
the term mean?



The **ecological footprint** is a measure of human demand on the Earth's ecological capacity to regenerate.



Exploring the Anthropocene: Our Ecological Footprint

Mathis Wackernagel, Ph.D.
Global Footprint Network

National Research University
Higher School of Economics
March 24, 2017



Data Source: Global Footprint Inquiry

Key Questions for the Inquiry

How much nature do we have?
How much nature do we use?

Does it matter if we use more
than what nature can renew?

Ecological Footprint Accounting

The two underlying questions:

How much nature do we have?
= biocapacity
= SUPPLY

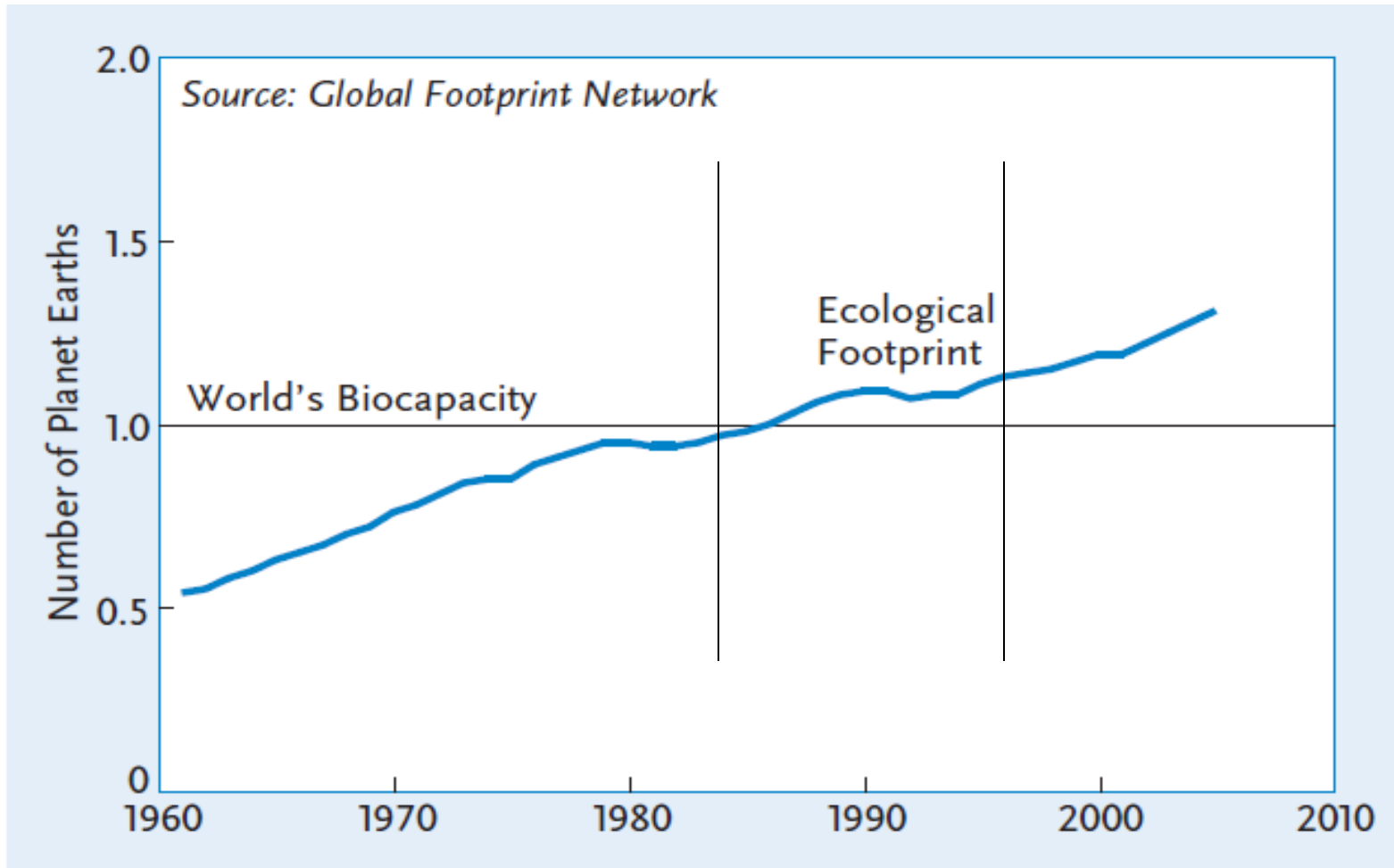
How much nature do we use?
= Footprint or demand on biocapacity
= DEMAND

A concrete, scalable answer to the planetary
boundary (safe operating space) concern.

How good is the answer?

1. Reviewed by over 10 national government institutes
2. Only answers one question (not quality).
3. Constant improvement with better data

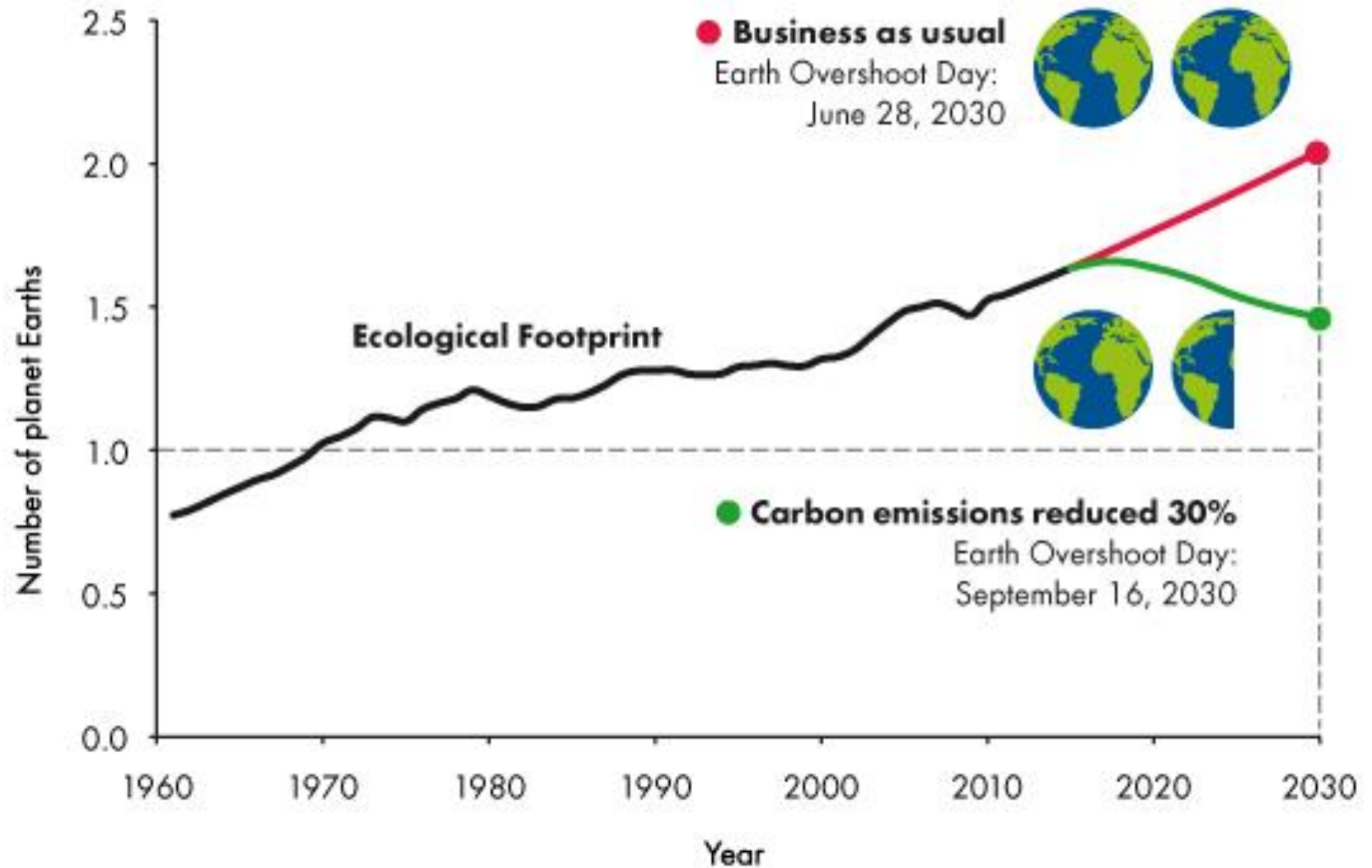
Humanity Ecological Footprint



Source: The State of the World, 2010. Worldwatch Institute.

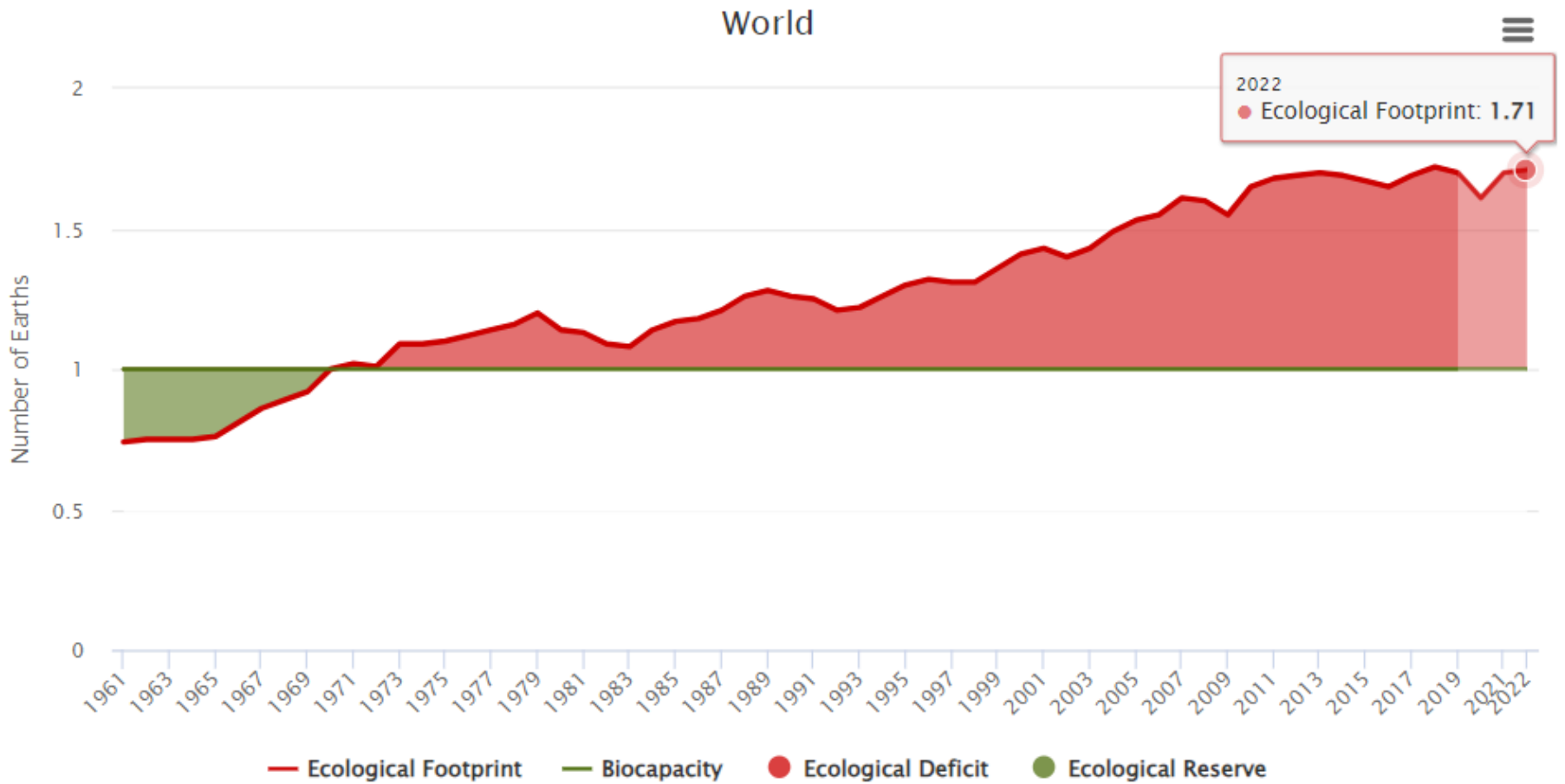
Humanity Ecological Footprint

How many Earths does it take to support humanity?



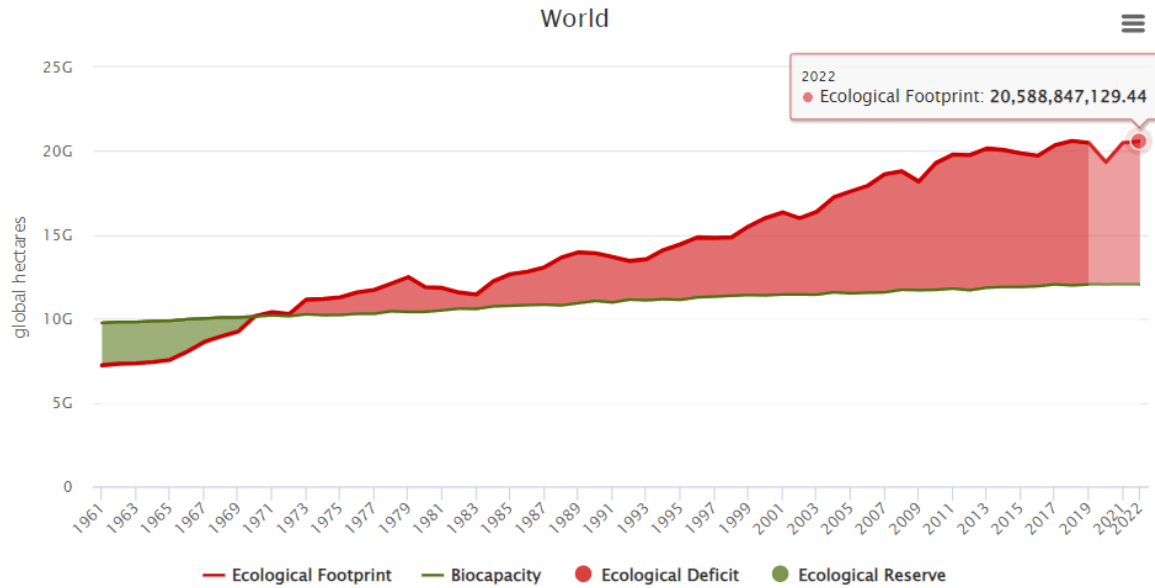
Sources: Global Footprint Network, 2016

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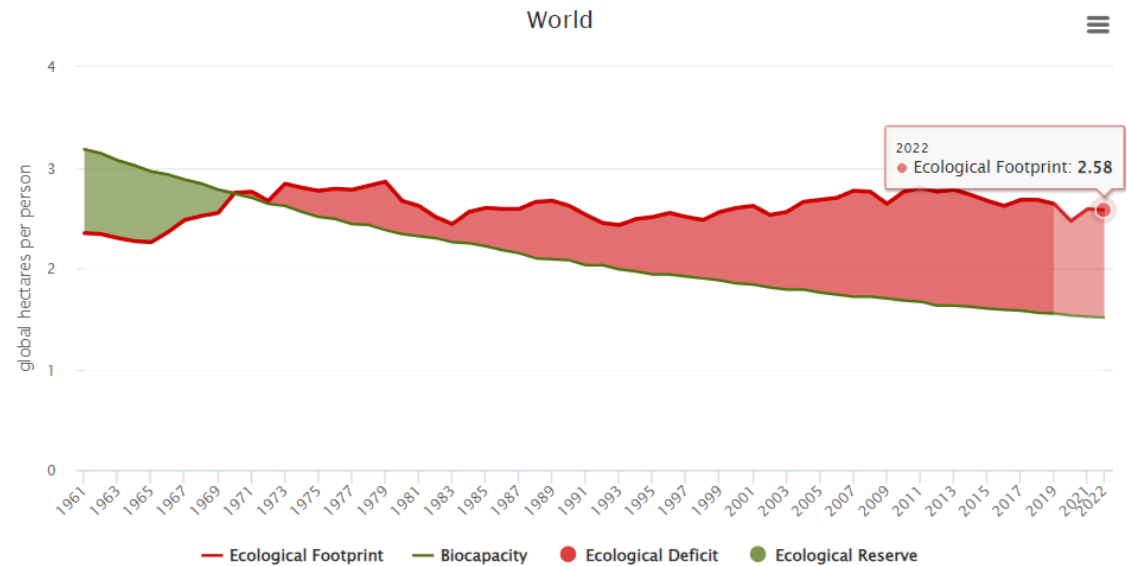


Global Hectars VS Global Hectars per Person

Show Page Hints



Show Page Hints



X WORLD (2022) (ESTIMATE)

GDP PER PERSON
\$13,004

POPULATION
7,975,099,904

Biocapacity
per person

1.5

gha

Ecological Footprint
per person

2.6

gha

BIOCAPACITY
RESERVE(+)/DEFICIT(-)

-1.1

gha

X WORLD (1970)

GDP PER PERSON
-

POPULATION
3,695,389,952

Biocapacity
per person

2.7

gha

Ecological Footprint
per person

2.7

gha

BIOCAPACITY
RESERVE(+)/DEFICIT(-)

0.0

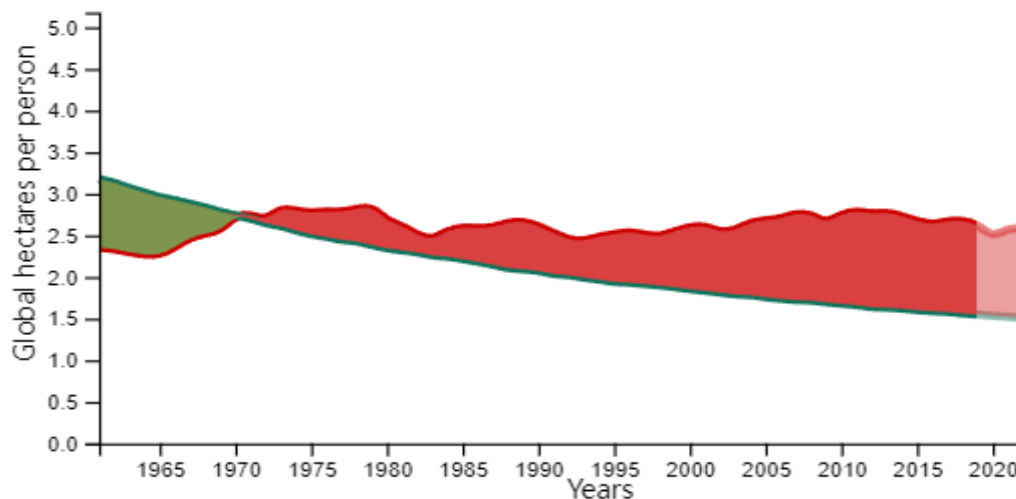
gha

Ecological Footprint and
Biocapacity
From 1961 to 2022
(last 3 years are estimates)

Ecological
Footprint per
person

Biocapacity per
person

Learn More



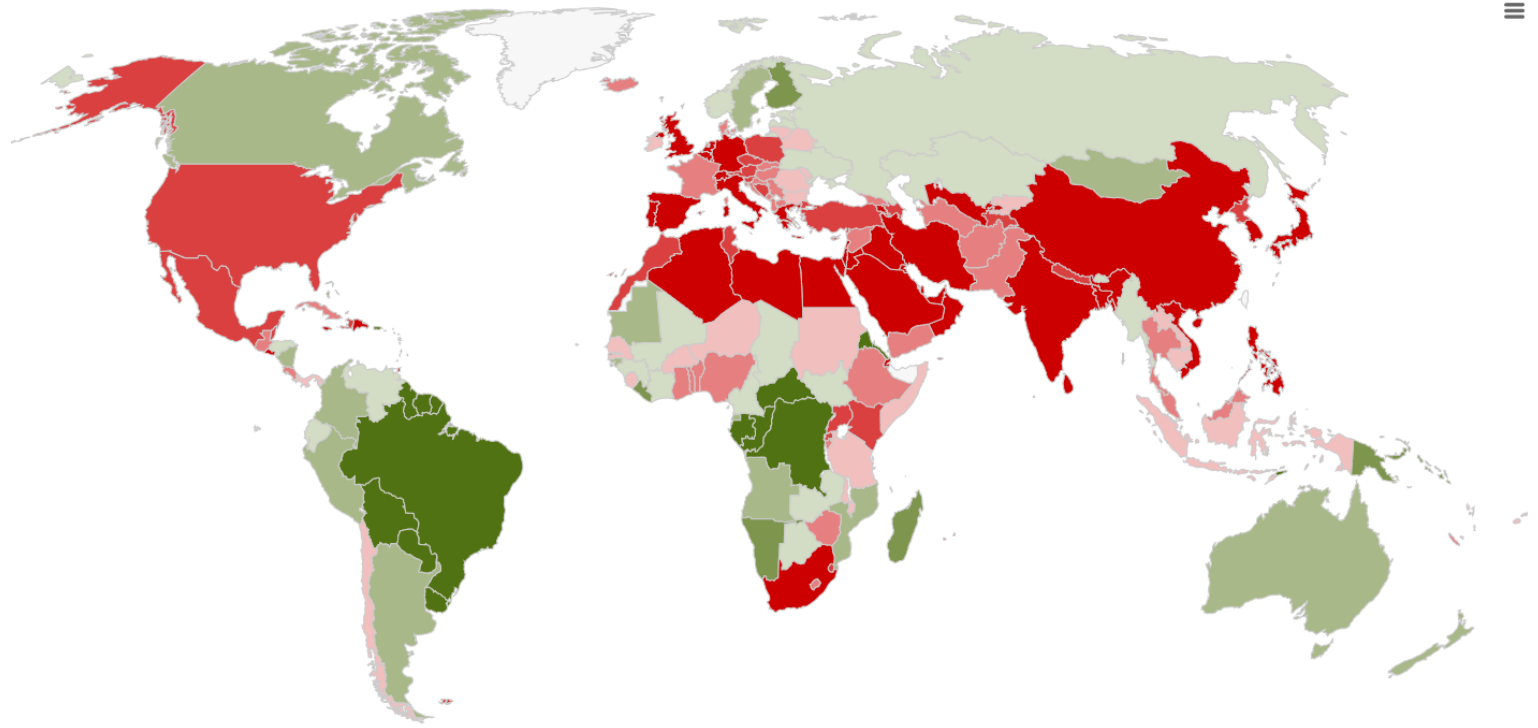
Data Sources: [National Footprint and Biocapacity Accounts 2023 edition \(Data Year 2019\)](#);
GDP, International Financial Statistics (IFS); Population, U.N. Food and Agriculture Organization.

Ecological Reserves and Ecological Deficits – current



$$\frac{\text{Humanity's Footprint}}{\text{Global Biocapacity}} = 1.6$$

Ecological Creditors and Debtors (2024)

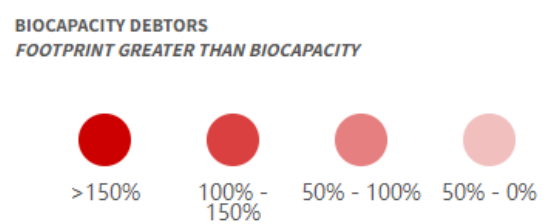
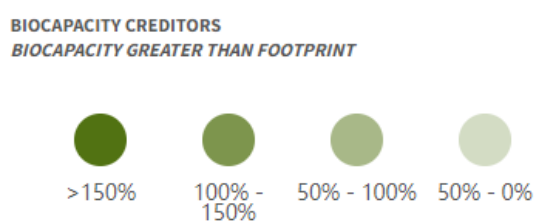


Legend for the map:

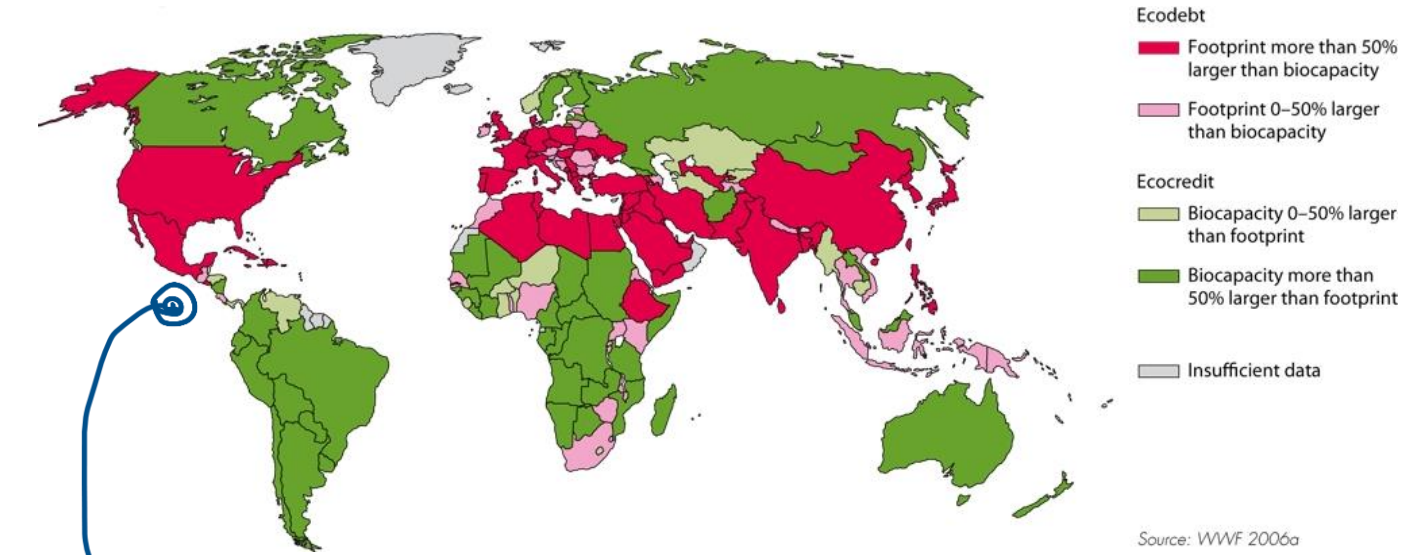
- ECOLOGICAL DEFICIT/RESERVE
- TOTAL ECOLOGICAL FOOTPRINT
- ECOLOGICAL FOOTPRINT PER PERSON
- TOTAL BIOCAPACITY
- BIOCAPACITY PER PERSON

ECOLOGICAL DEFICIT/RESERVE

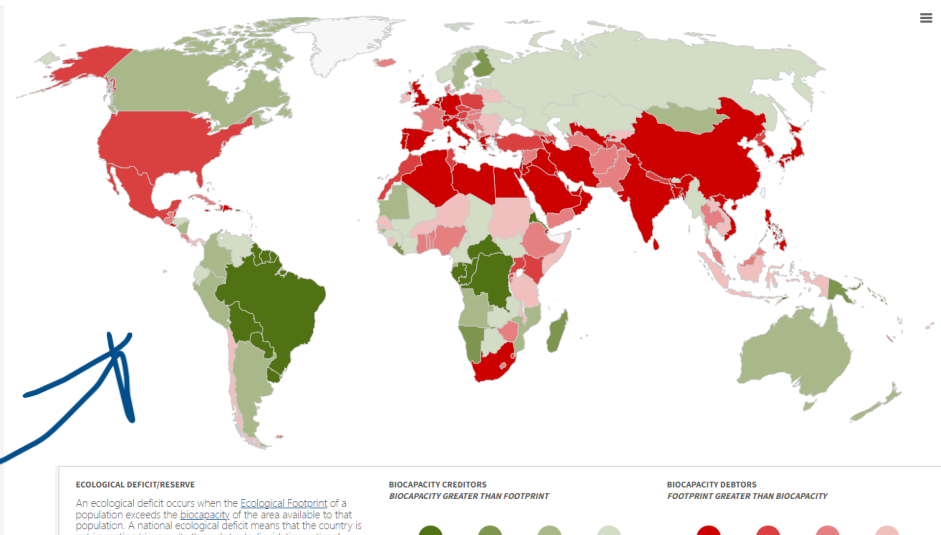
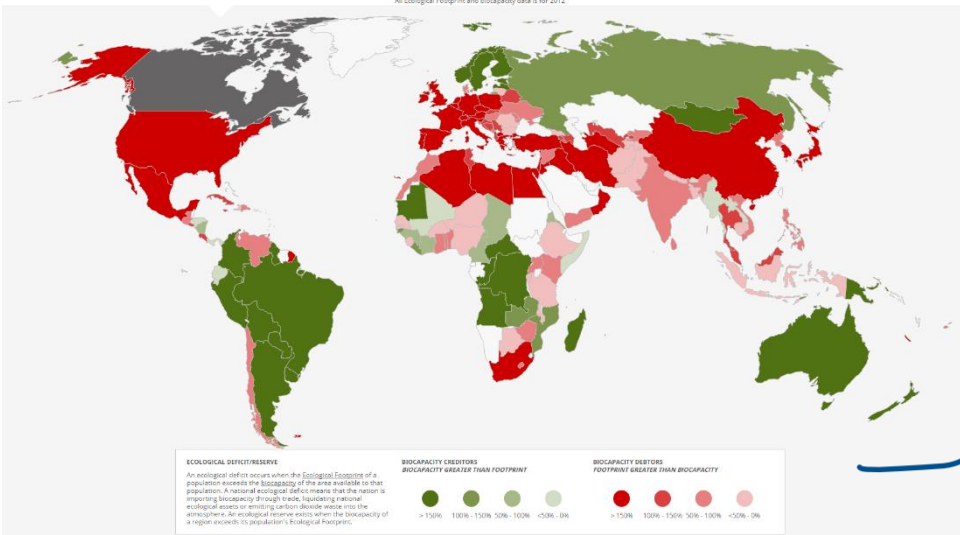
An ecological deficit occurs when the [Ecological Footprint](#) of a population exceeds the [biocapacity](#) of the area available to that population. A national ecological deficit means that the country is net-importing biocapacity through trade, liquidating national ecological assets or emitting more carbon dioxide waste into the atmosphere than its own ecosystems absorb. In contrast, an ecological reserve exists when the biocapacity of a region exceeds its population's Ecological Footprint.



Ecological Creditors and Debtors: dynamics 2002-2012-2024



All Ecological Footprints and biocapacity data is for 2012



Ecological Debtors (2012-2024)

COUNTRIES WITH BIOCAPACITY RESERVE

PERCENTAGE THAT BIOCAPACITY EXCEEDS ECOLOGICAL FOOTPRINT

Eritrea	160%
Timor-Leste	150%
Congo, Democratic Republic of	90%
Congo	69%
Angola	68%
Central African Republic	68%
Mozambique	67%
Madagascar	63%
Zambia	56%
Liberia	43%
Guinea-Bissau	32%

COUNTRIES WITH BIOCAPACITY RESERVE

PERCENTAGE THAT BIOCAPACITY EXCEEDS ECOLOGICAL FOOTPRINT

French Guiana	4,900%
Suriname	2,160%
Guyana	1,460%
Gabon	811%
Congo	635%
Central African Republic	462%
Bahamas	447%
Uruguay	380%
Bolivia	361%
Puerto Rico	315%

South Sudan	8%
Ecuador	5%
Chad	4%
Bhutan	2%
Kazakhstan	1%
Fiji	0%
Vanuatu	0%
Panama	0%

Ecological Creditors (2012-2024)

COUNTRIES WITH BIOCAPACITY DEFICIT

PERCENTAGE THAT ECOLOGICAL FOOTPRINT EXCEEDS BIOCAPACITY

Singapore	16,000%
Réunion	1,900%
Israel	1,700%
Cyprus	1,100%
Lebanon	1,100%
Jordan	890%
Luxembourg	840%
Korea, Republic of	740%
Japan	600%
Iraq	560%
Belgium	530%

COUNTRIES WITH BIOCAPACITY DEFICIT

PERCENTAGE THAT ECOLOGICAL FOOTPRINT EXCEEDS BIOCAPACITY

Laos	-1%
Seychelles	-1%
Sudan	-1%
Romania	-13%
Lithuania	-14%
Sierra Leone	-15%
Tanzania	-16%
Bulgaria	-18%
Chile	-20%
Grenada	-21%

Qatar	-1,100%
Barbados	-1,200%
Kiribati	-1,300%
Bahrain	-1,400%
United Arab Emirates	-1,500%
Israel	-1,600%
St. Kitts and Nevis	-1,800%
Reunion	-3,200%
Singapore	-6,100%
Nauru	-46,000%

EF_c

=

 EF_p

+

(

 EF_i

-

 EF_e

)

Ecological Footprint of Consumption

The Ecological Footprint of consumption indicates the consumption of biocapacity by a country's inhabitants.

In order to assess the total domestic demand for resources and ecological services of a population, we use the Ecological Footprint of consumption (EF_c). EF_c accounts for both the export of national resources and ecological services for use in other countries, and the import of resources and ecological services for domestic consumption.

EF_c is most amenable to change by individuals through changes in their consumption behavior.

Ecological Footprint of Production

The Ecological Footprint of production indicates the consumption of biocapacity resulting from production processes within a given geographic area, such as a country or region.

It is the sum of all the bioproductive areas within a country necessary for supporting the actual harvest of primary products (cropland, grazing land, forestland and fishing grounds), the country's built-up area (roads, factories, cities), and the area needed to absorb all fossil fuel carbon emissions generated within the country.

This measure mirrors the gross domestic product (GDP), which represents the sum of the values of all goods and services produced within a country's borders.

Net Ecological Footprint of Trade

The Ecological Footprint of imports and exports indicate the use of biocapacity within international trade.

Embedded in trade between countries is a use of biocapacity, the net Ecological Footprint of trade (the Ecological Footprint of imports minus the Ecological Footprint of exports). If the Ecological Footprint embodied in exports is higher than that of imports, then a country is a net exporter of renewable resources and ecological services.

Conversely, a country whose Footprint of imports is higher than that embodied in exports depends on the renewable resources and ecological services generated by ecological assets from outside its geographical boundaries.

X

WORLD (1970)

GDP PER PERSON

-

POPULATION

3,695,389,952

Biocapacity
per person

?

2.7

gha

Ecological Footprint
per person

?

2.7

gha

BIOCAPACITY
RESERVE(+)/DEFICIT(-)

?

0.0

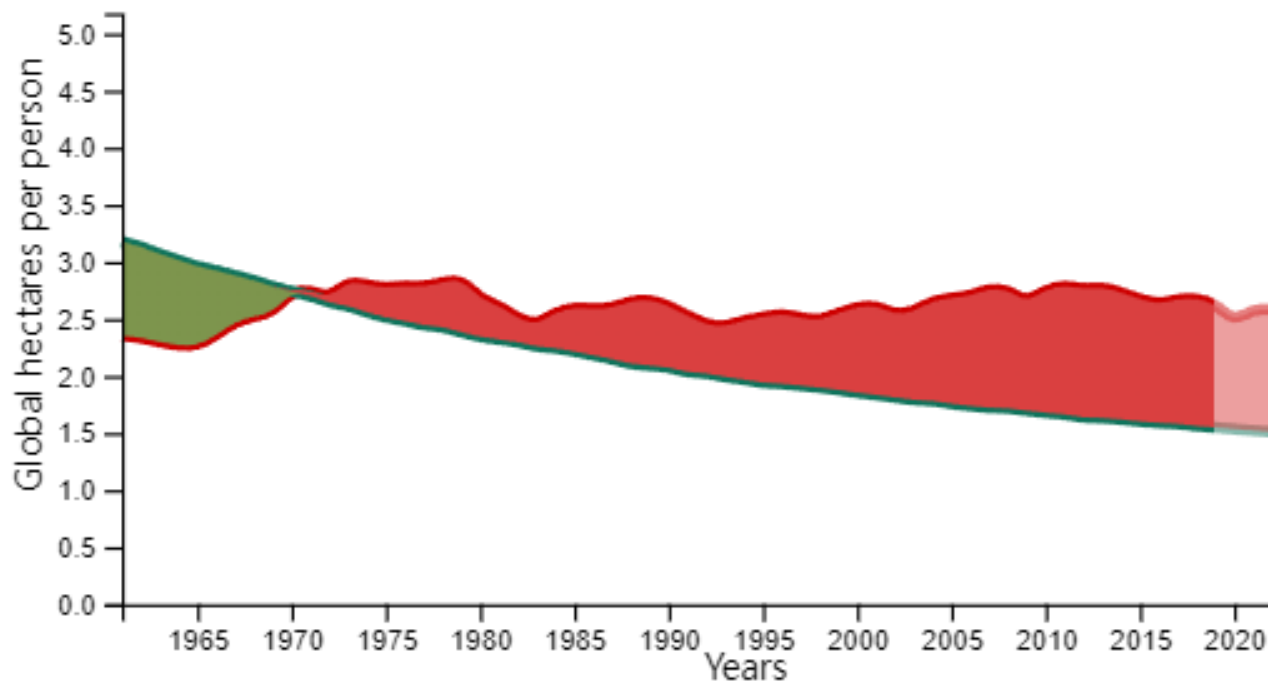
gha

Ecological Footprint and
Biocapacity
From 1961 to 2022
(last 3 years are estimates)

Ecological
Footprint per
person

Biocapacity per
person

Learn More



Data Sources: [National Footprint and Biocapacity Accounts 2023 edition \(Data Year 2019\)](#);
GDP, International Financial Statistics (IFS); Population, U.N. Food and Agriculture Organization.

Comparing national footprints: Russia, India, China, Egypt

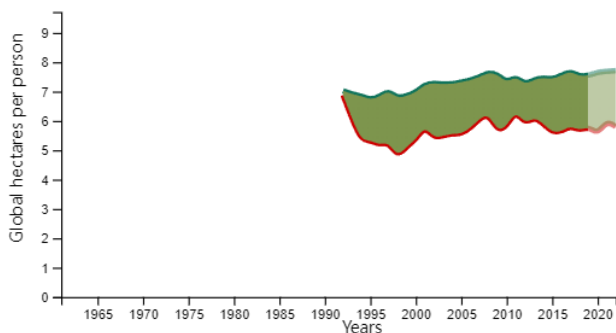
X RUSSIA (2022) (ESTIMATE)

GDP PER PERSON \$12,639 POPULATION 144,712,992

Biocapacity per person **7.7** gha - Ecological Footprint per person **5.8** gha = BIOCAPACITY RESERVE(+)/DEFICIT(-) **1.9** gha

Ecological Footprint and Biocapacity From 1961 to 2022 (last 3 years are estimates)

Ecological Footprint per person
Biocapacity per person



Learn More

Data Sources: National Footprint and Biocapacity Accounts 2023 edition (Data Year 2019); GDP, International Financial Statistics (IFS); Population, U.N. Food and Agriculture Organization.

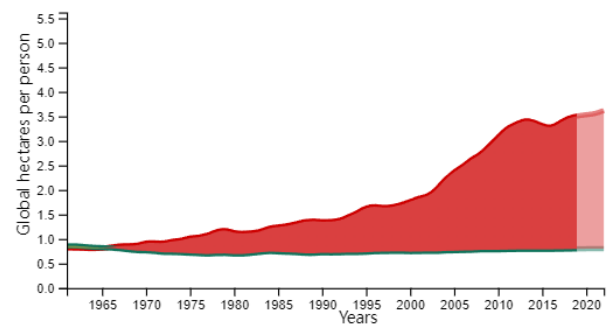
X CHINA (2022) (ESTIMATE)

GDP PER PERSON \$13,657 POPULATION 1,457,959,936

Biocapacity per person **0.8** gha - Ecological Footprint per person **3.6** gha = BIOCAPACITY RESERVE(+)/DEFICIT(-) **-2.8** gha

Ecological Footprint and Biocapacity From 1961 to 2022 (last 3 years are estimates)

Ecological Footprint per person
Biocapacity per person



Learn More

Data Sources: National Footprint and Biocapacity Accounts 2023 edition (Data Year 2019); GDP, International Financial Statistics (IFS); Population, U.N. Food and Agriculture Organization.

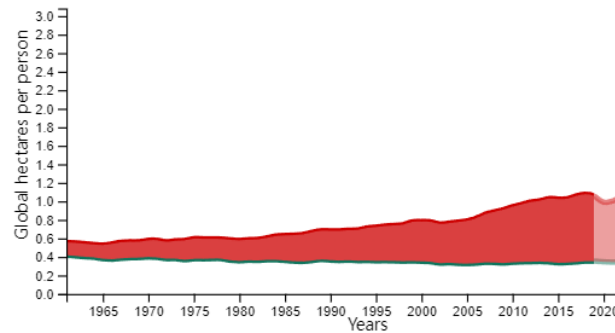
X INDIA (2022) (ESTIMATE)

GDP PER PERSON \$2494 POPULATION 1,417,170,048

Biocapacity per person **0.3** gha - Ecological Footprint per person **1.0** gha = BIOCAPACITY RESERVE(+)/DEFICIT(-) **-0.7** gha

Ecological Footprint and Biocapacity From 1961 to 2022 (last 3 years are estimates)

Ecological Footprint per person
Biocapacity per person



Learn More

Data Sources: National Footprint and Biocapacity Accounts 2023 edition (Data Year 2019); GDP, International Financial Statistics (IFS); Population, U.N. Food and Agriculture Organization.

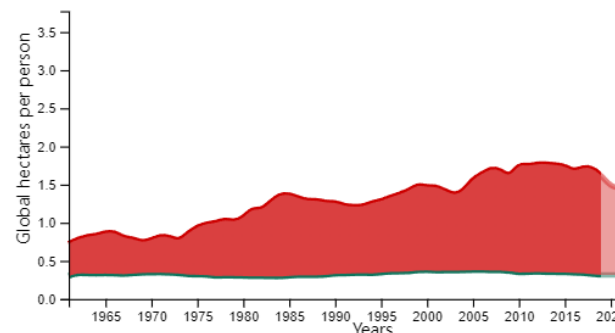
X EGYPT (2022) (ESTIMATE)

GDP PER PERSON \$3925 POPULATION 110,990,000

Biocapacity per person **0.3** gha - Ecological Footprint per person **1.5** gha = BIOCAPACITY RESERVE(+)/DEFICIT(-) **-1.2** gha

Ecological Footprint and Biocapacity From 1961 to 2022 (last 3 years are estimates)

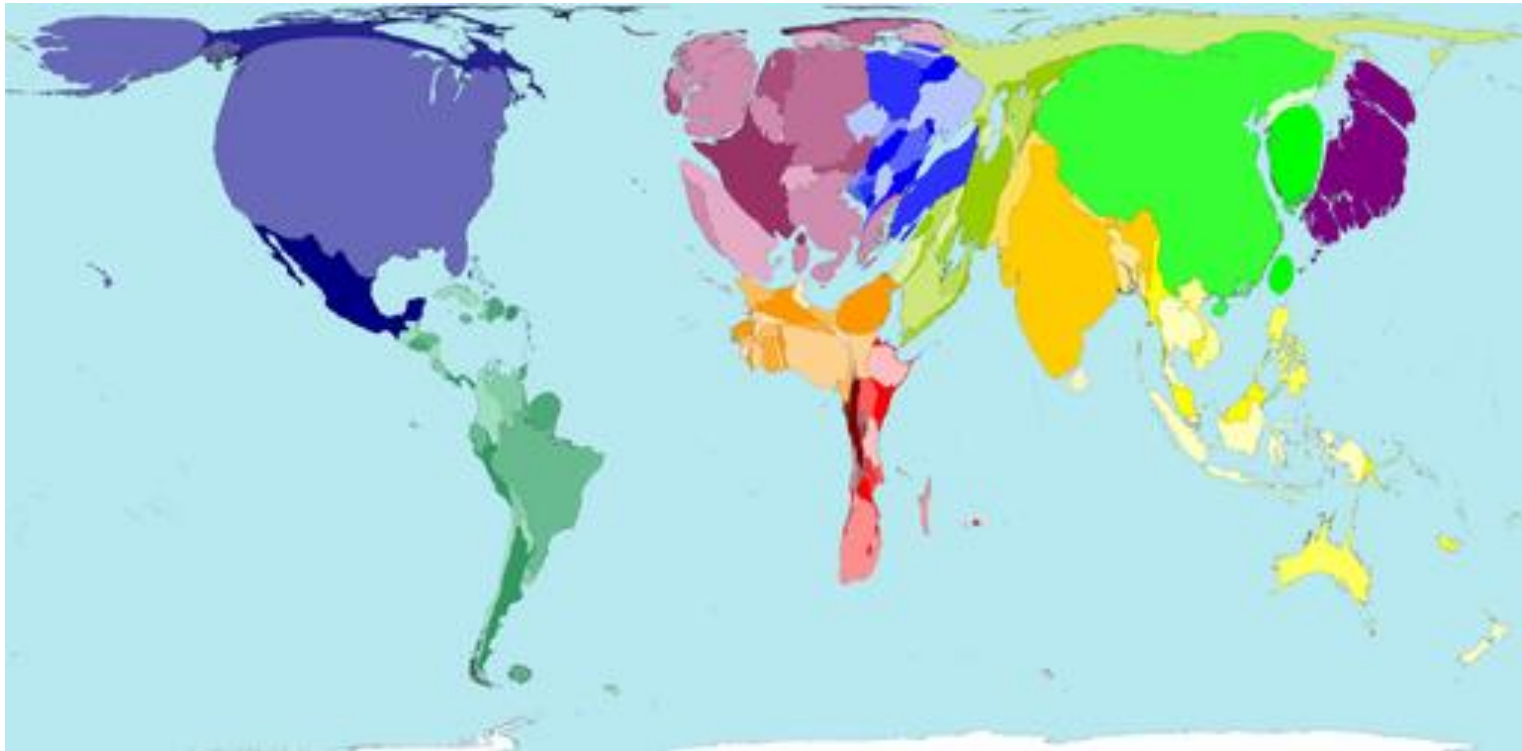
Ecological Footprint per person
Biocapacity per person



Learn More

Data Sources: National Footprint and Biocapacity Accounts 2023 edition (Data Year 2019); GDP, International Financial Statistics (IFS); Population, U.N. Food and Agriculture Organization.

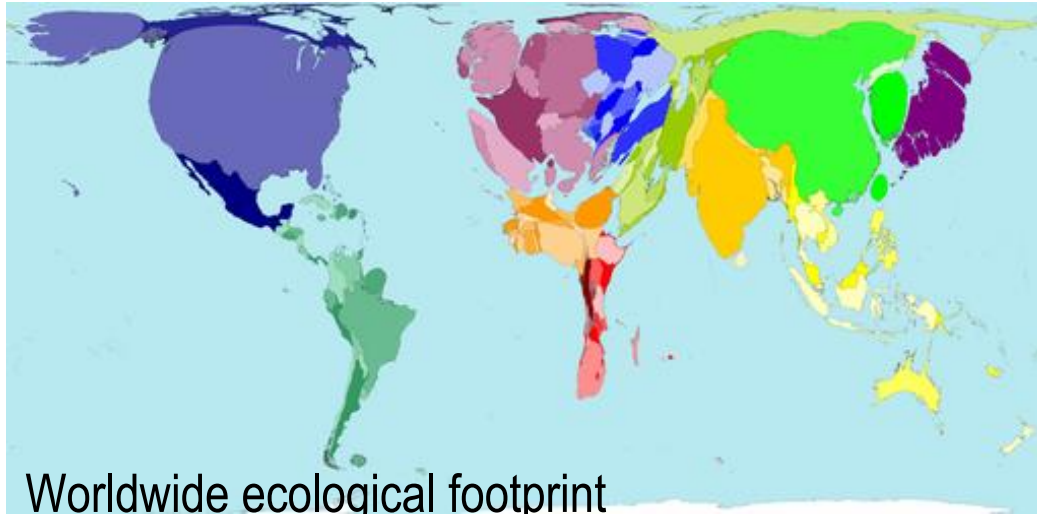
Worldwide ecological footprint



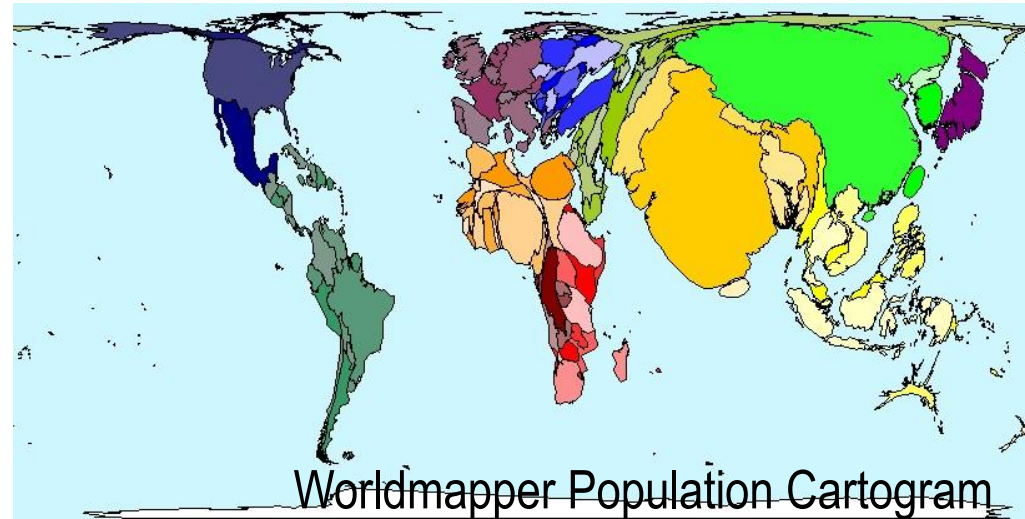
- Territory size shows the proportion of the worldwide ecological footprint which is made there.
- **This includes the consumption of food, fuel, wood, and fibres. Pollution, such as carbon dioxide emissions, is also counted as part of the footprint**

Source: <http://www.worldmapper.org/>

Worldwide ecological footprint VS Population



Worldwide ecological footprint



Worldmapper Population Cartogram

Source: <http://www.worldmapper.org/>

- Ecological Footprint: is it a SCIENTIFIC CONCEPT or PSEUDO-CONCEPT?
- *The clue is in its methodology*
- [For more information see:
https://journals.plos.org/plosbiology/article?id=10
.1371/journal.pbio.1001700](https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1001700)

Formal Comment

The Ecological Footprint Remains a Misleading Metric of Global Sustainability

Linus Blomqvist^{1*}, Barry W. Brook², Erle C. Ellis³, Peter M. Kareiva⁴, Ted Nordhaus¹, Michael Shellenberger¹

1 Breakthrough Institute, Oakland, California, United States of America, **2** The Environment Institute and School of Earth and Environmental Sciences, The University of Adelaide, Adelaide, South Australia, Australia, **3** Department of Geography and Environmental Systems, University of Maryland Baltimore County, Baltimore, Maryland, United States of America, **4** The Nature Conservancy, Seattle, Washington, United States of America

The Formal Comment by Rees and Wackernagel [1] raises our concern that this exchange will confuse readers. For this reason, we aim to emphasize a few key points that we believe cannot be disputed. First, the entire global ecological overshoot (footprint of consumption in excess of biocapacity) results from carbon dioxide emissions reframed as the hypothetical forest area needed to offset these emissions. Plantations of fast-growing trees would, by-the-numbers, eliminate the global overshoot. Second, the ecological footprint's (EF) assessments for cropland, grazing land, and built-up land are unable to capture degradation or unsustainable use of any kind. Finally, we conclude from the above and the points made in our original paper [2] that we would be better off discussing greenhouse gas emissions directly in terms of tons of CO₂-equivalent (and thus focus on solutions to emissions), and developing a more ecological and ecosystem process framework to capture the impacts humans currently have on the planet's natural systems. The appropriate scale for these indicators will, in many cases, be local and regional. At this level, the EF is a measure of net exports or imports of biomass and carbon-absorptive capacity [3]. Any city, for example, would show a deficit, as it relies on food and materials from outside. That in itself, as Robert Costanza has

noted, "tells us little if anything about the sustainability of this input [from outside the region] over time" [4].

Author Contributions

The author(s) have made the following declarations about their contributions: Wrote the paper: PK LB EE BB TN MS.

Citation: Blomqvist L, Brook BW, Ellis EC, Kareiva PM, Nordhaus T, et al. (2013) The Ecological Footprint Remains a Misleading Metric of Global Sustainability. *PLoS Biol* 11(11): e1001702. doi:10.1371/journal.pbio.1001702

Academic Editor: Georgina M. Mace, University College London, United Kingdom

Published: November 5, 2013

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Competing Interests: This Formal Comment is a response to Rees and Wackernagel (this issue) by the authors of the original Perspective "Does the Shoe Fit? Real versus Imagined Ecological Footprints" (this issue).

* E-mail: linus@thebreakthrough.org

References

1. Rees WE, Wackernagel M (2013) The Shoe Fits, but the Footprint is Larger than Earth. *PLoS Biol* 11(11): e1001701. doi:10.1371/journal.pbio.1001701
2. Blomqvist L, Brook BW, Ellis EC, Kareiva PM, Nordhaus T, et al. (2013) Does the Shoe Fit? Real versus Imagined Ecological Footprints. *PLoS Biol* 11(11): e1001700. doi:10.1371/journal.pbio.1001700
3. van den Bergh J, Verbruggen H (1999) Spatial sustainability, trade and indicators: an evaluation of the "ecological footprint". *Ecol Econ* 29:61–72.
4. Costanza R (2000) The dynamics of the ecological footprint concept. *Ecol Econ* 32:341–345.

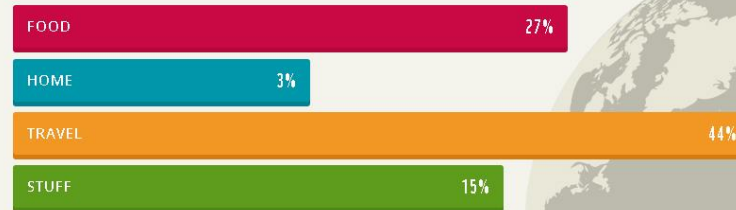
The Formal Comment by Rees and Wackernagel [1] raises our concern that this exchange will confuse readers. For this reason, we aim to emphasize a few key points that we believe cannot be disputed. First, the entire global ecological overshoot (footprint of consumption in excess of biocapacity) results from carbon dioxide emissions reframed as the hypothetical forest area needed to offset these emissions. Plantations of fast-growing trees would, by-the-numbers, eliminate the global overshoot. Second, the ecological footprint's (EF) assessments for cropland, grazing land, and built-up land are unable to capture degradation or unsustainable use of any kind. Finally, we conclude from the above and the points made in our original paper [2] that we would be better off discussing greenhouse gas emissions directly in terms of tons of CO₂-equivalent (and thus focus on solutions to emissions), and developing a more ecological and ecosystem process framework to capture the impacts humans currently have on the planet's natural systems. The appropriate scale for these indicators will, in many cases, be local and regional. At this level, the EF is a measure of net exports or imports of biomass and carbon-absorptive capacity [3]. Any city, for example, would show a deficit, as it relies on food and materials from outside. That in itself, as Robert Costanza has

Ecological Footprint Calculations



YOUR LIVING HABITS MAKE UP YOUR FOOTPRINT

We calculate your footprint score using the answers you provide to our 5 minute questionnaire



1. Your results in comparison with the country's average
2. Spheres of life mostly contributing to the CO2 footprint
3. What else could be included into CO2 footprint calculators?
4. Ways of minimizing CO2 footprint

Your results in comparison with the country's average

Welcome

House

Flights

Car

Motorbike

Bus & Rail

Secondary

Results



Welcome to the web's leading carbon footprint calculator

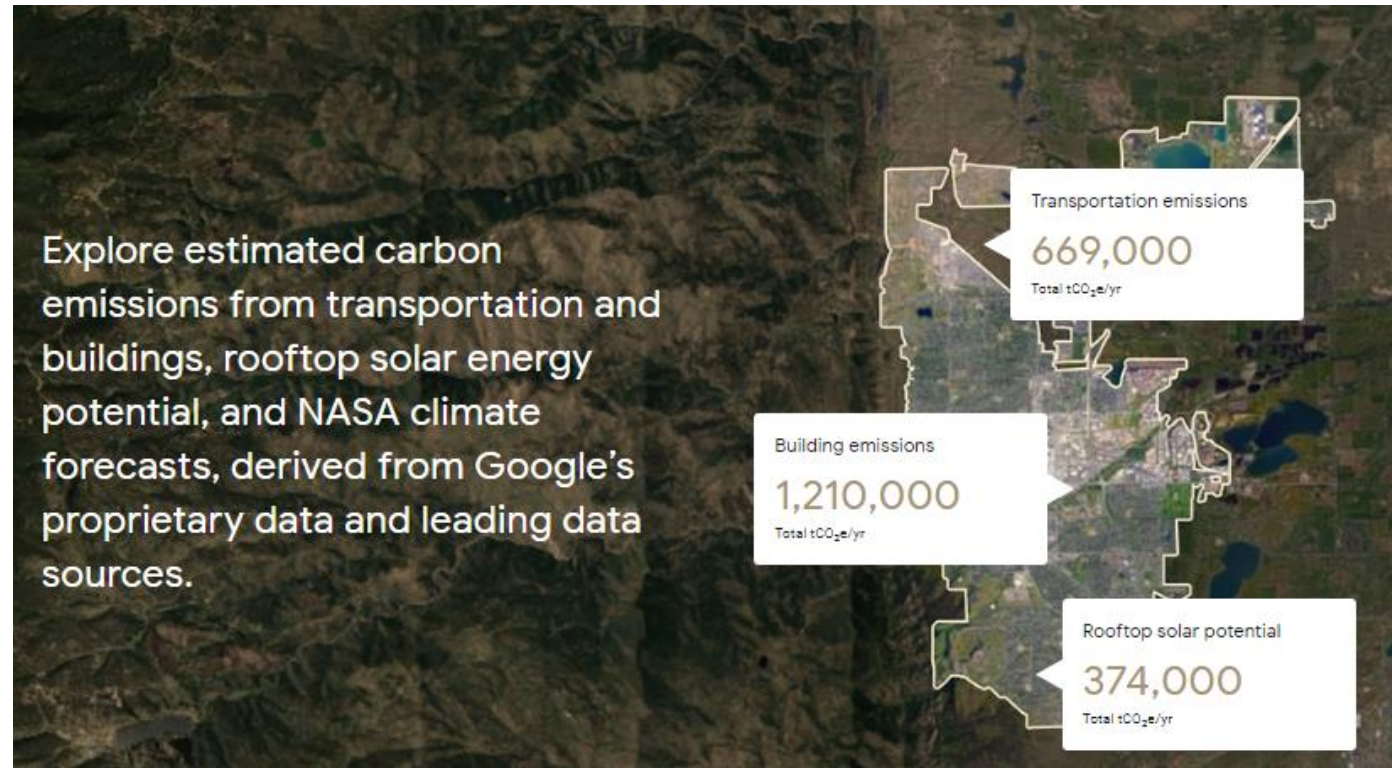


- <http://www.carbonfootprint.com/calculator.aspx>
- Your footprint is _____ tonnes per year
- The average footprint for people in Russian Federation is
- The average footprint for people in China is
- The average footprint for people in India is
- The average footprint for people in Egypt is
- The average for the European Union is about
- The average worldwide carbon footprint is about



Google Environmental Insights Explorer

- Calculating a city's carbon footprint
- The Environmental Insights Explorer calculates emissions from buildings, car trips, and public transport to illustrate how a city's sustainability efforts are faring.



<https://insights.sustainability.google/>

<https://www.fastcompany.com/90233731/a-new-use-for-google-maps-calculating-a-citys-carbon-footprint>



- Kyoto Protocol
 - the 1st international legislation on emissions cut
- EU
 - environment legislation has a strong public participation component
- UK
 - the Climate Change Act 2008 makes it the first country in the world to have a legally binding long-term framework to cut carbon emissions.
- Russia
 - Climate Doctrine, Dec. 2009



GENERAL INSTRUMENTS

- **Market reforms:** market liberalization, energy efficiency programs, trade and price liberalization

SPECIFIC INSTRUMENTS

- **Strategic policy:** national strategic plans and programs, doctrines
- **Tax policy:** immunity from taxation, emission taxes, subsidies
- **Emission trade,** green certificates
- **Adjusting mechanisms:** **obligatory standards**, systems of certification, verification and monitoring
- **Voluntary agreements:** “strong” and “soft”
- **Research:** research programs with demonstrational effect
- **Informational instruments:** marking programs, informational campaigns



Международная
организация по
стандартизации

- **ISO* 14001:2015** is a universal **environmental management standard (EMS)**.
 - specifies a set of environmental management requirements (systemic, policy, planning, operational, checking) that the organization identifies as those **which it can control and those which it can influence**
 - is **applicable to any organization** that wishes to implement and improve an EMS
 - **does not itself state specific environmental performance criteria**

<https://youtu.be/hCAa7OWdjfo>

- **EMAS (Environmental Management Audit System)** is a specialized environmental standard
 - **Is obligatory for certain types of industries** such as processing industries, electricity, gas and water supply, waste disposal

Example. ISO 13065:2015. *Sustainability criteria for bioenergy*

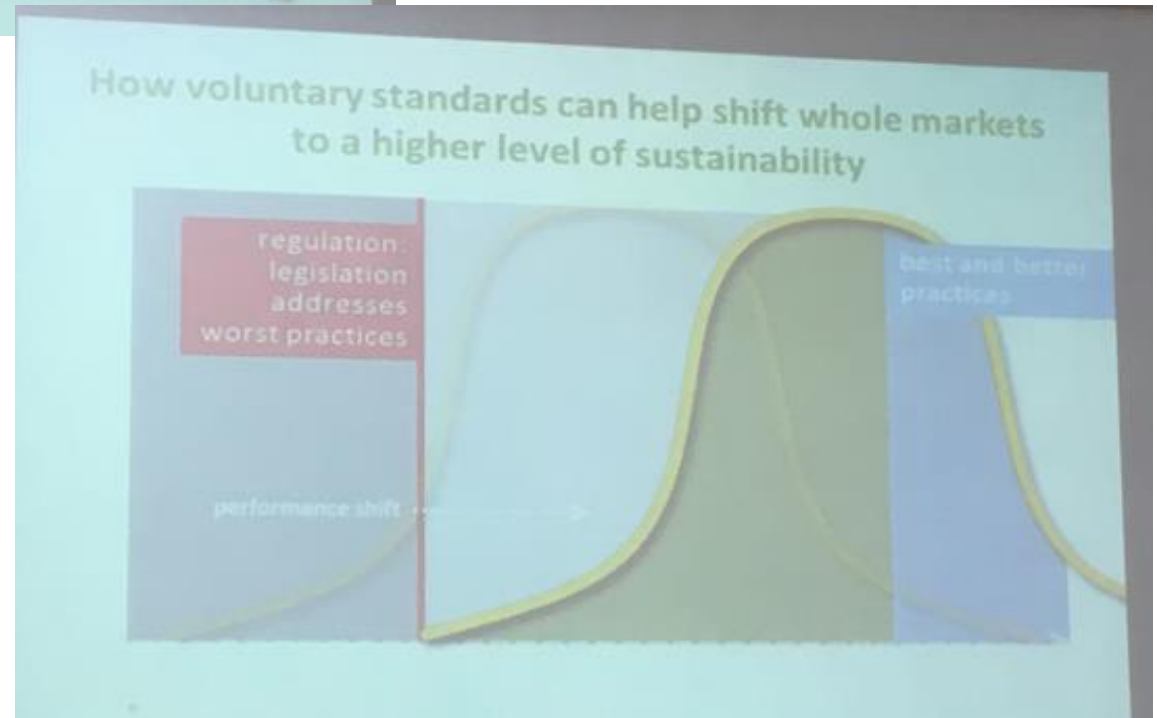
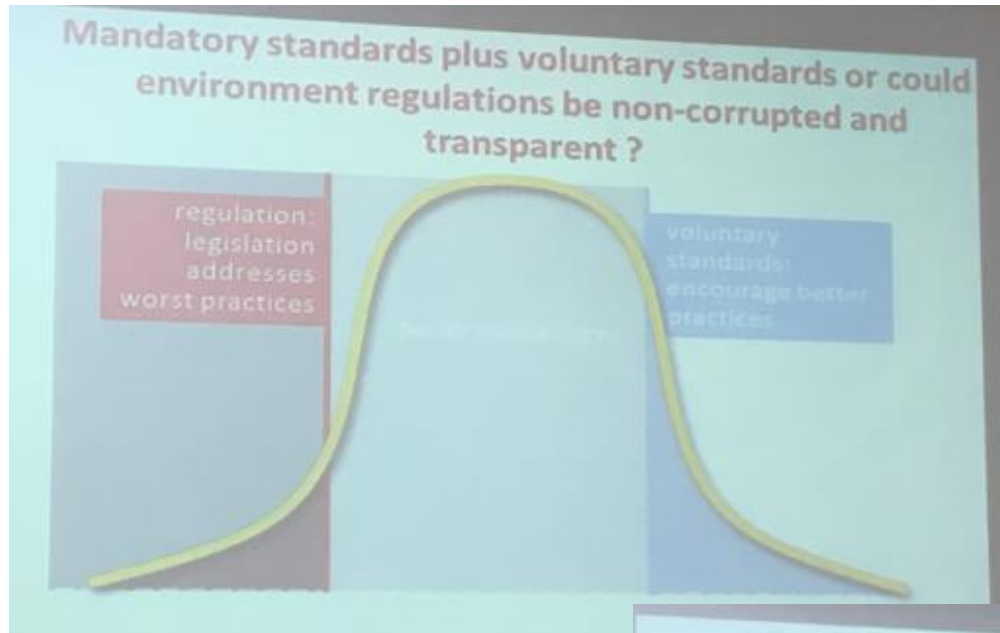
Who will benefit?

- ISO 13065 provides a harmonized approach on sustainability criteria rather than providing threshold values. It can be adopted by several users in different ways:
 - **Businesses** – by providing a standard framework that allows business to speak the same language when describing aspects of sustainability
 - **Purchasers** – by comparing sustainability information from suppliers to help identify bioenergy processes and products that meet their requirements
 - **Other standards, certification initiatives and government agencies** – by serving as a source of information on sustainability, and a transparent basis for all market actors to comply with legal requirements
- ISO 13065 can be applied to the whole supply chain, parts of the supply chain or a single process in the supply chain. It also applies to all forms of bioenergy, regardless of raw material, geographical location, technology or end use.
- **ISO 13065 will not replace national legislation nor certification systems on sustainability.**
- **VIDEO on ISO 9001:2015:**
http://www.iso.org/iso/ru/home/news_index/news_archive/news.htm?refid=Ref2002 (0:00 – 3:00)



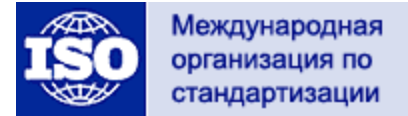
- **Business Environmental Responsibility (ER)**
 - doesn't depend on the size of environmental issues relevant to its operation
 - represents new conditions for global competition
 - ✓ ER of commodity producers
 - ✓ Ecological and energy efficiency of products
 - ✓ Formation of environmentally sensitive markets
 - ✓ International environmental standards
 - ✓ Best available technologies
- Environmental policy is the way to improve the competitiveness of the national economy as well as of the separate company

Mandatory Standards + Voluntary Standards



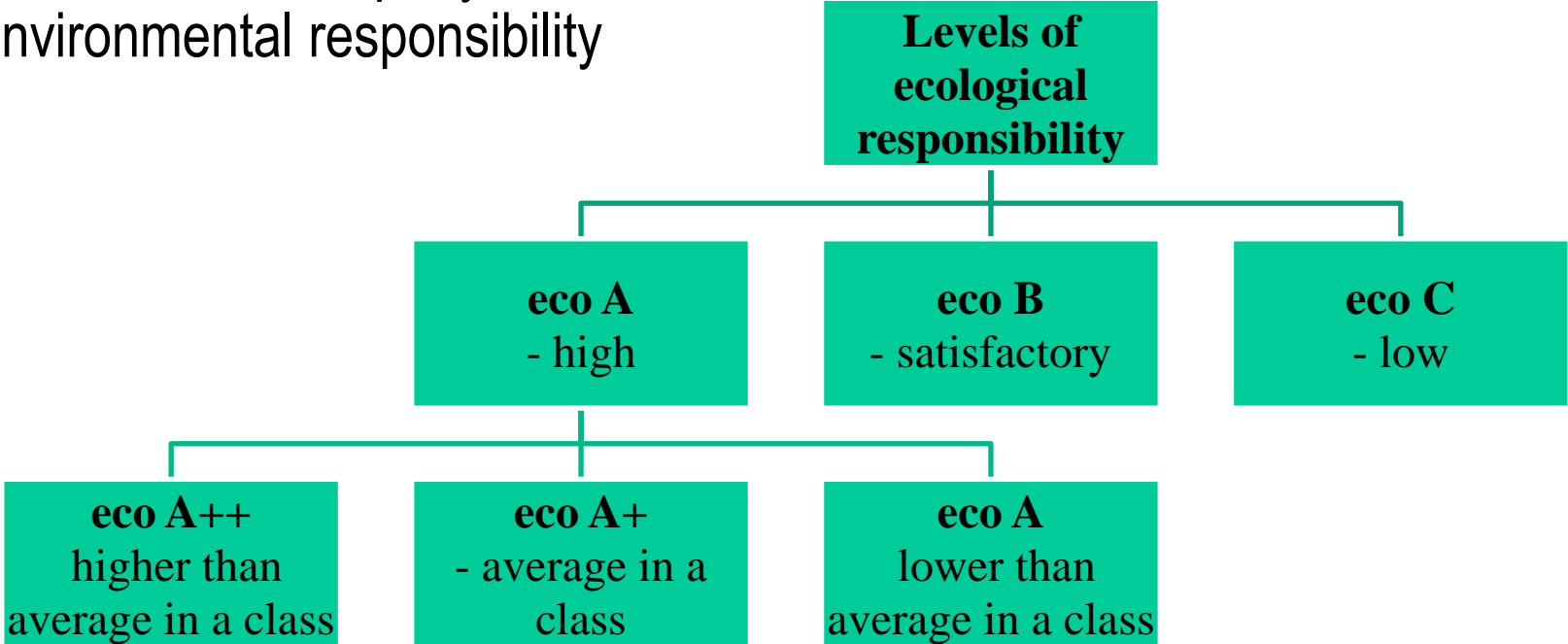


- Environmental management system
 - Ecoratings (voluntary)
 - Environmental management standards (ISO* 14001:2015)
 - ESG-ratings



Ecoratings: Levels of Ecological Responsibility

Ecorating is a complex evaluation of company environmental responsibility





- Ecorating should be:
 - Complex & Full covering
 - Independent, Objective
 - Voluntary

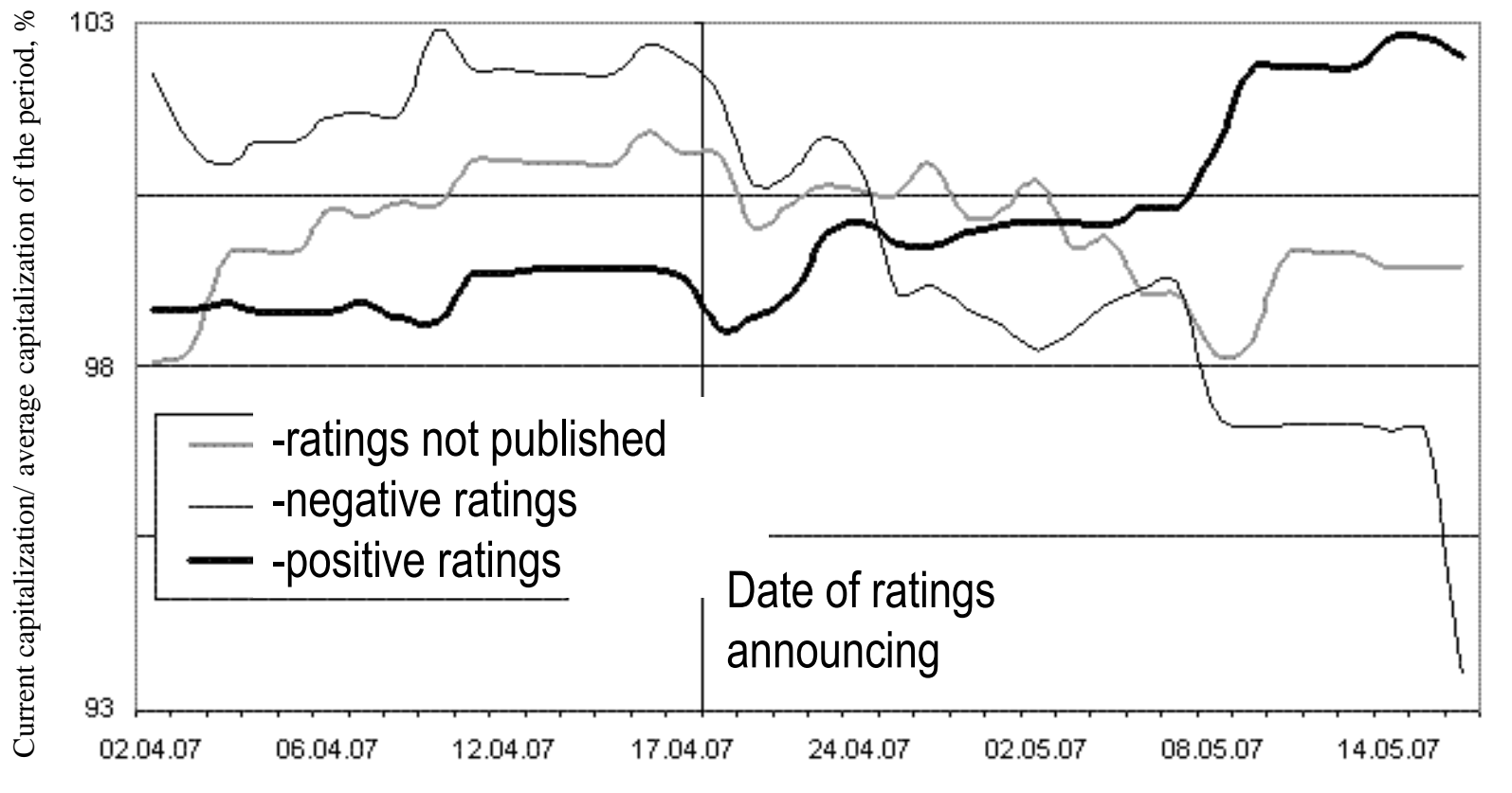
- Are ecoratings important for companies?



- Why ecoratings are important for companies?
 - Independent source of a company current environmental status
 - Objective comparison of companies by a set of ecological indicators
 - Monitoring dynamics of companies indicators
 - Acknowledgement of serious environment initiatives for business partners

 - Effective way to attract product consumers
 - New mechanism of information and feedback between industry and the society
 - Reducing environmental impacts through improved policies and practices and increasing transparency

Market Reaction to Publication of Ecoratings



Source: ANO "NERA," <http://www.biodat.ru/nera3.htm>

Positive (high) ecorating position correlates well with the capitalization of a company

Basic Principles of Ecoratings

- Methodology is discussed with all the participants and is updated every year
- Calculations are made by independent rating agency using only the officially published data
- After preliminary results are obtained companies can reveal missing information
- All major industry players are covered by their industry ecorating each year
- Ecorating assessment goes through all the stages of industrial process

Most popular ESG standards, rankings and ratings

The 8 ratings included in this brief are used by many leading investors, asset managers, analysts, and other financial experts



1

Why companies should manage risks when it comes to environmental responsibility?

Aims of Session 2

1. To develop basic understanding how financial evaluation of ecological damages is made
2. To analyze Disaster Risk Management Systems and understand their basic elements
3. To get closer to the concept of Ecological Footprint and take this concept critically
4. To know specifics among different instruments of Business Environmental Responsibility (environmental standards, ecoratings, ESG ratings)