



COURSE FOR SUSTAINABILITY

STRATEGIES, METHODOLOGIES, POLICIES AND ACTIONS FOR CENTRAL AND EASTERN EUROPE

Environment and development: an introduction

János Zlinszky

Fall 2020/21

Introductory course? What does it mean?



Laying foundations by

- Repeating and arranging existing knowledge
- Giving new definitions
- Clarifying concepts
- Getting basic familiarity with the current sustainable development agenda





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Current processes

<http://www.worldometers.info/>

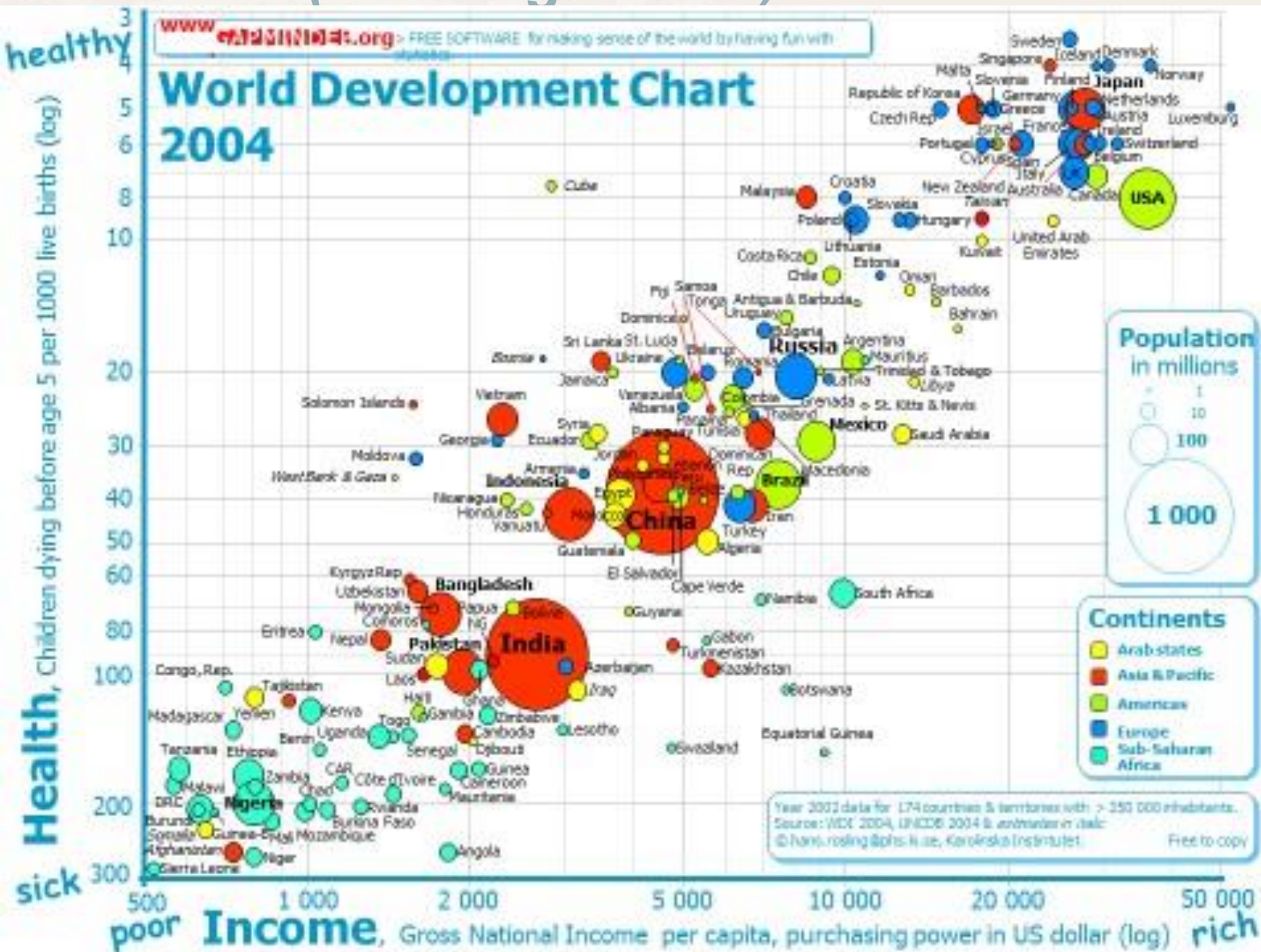


Did we see

Development
and (?) / or (?)
Growth?

Development

(meaning: better)



Growth
i.e.:
larger

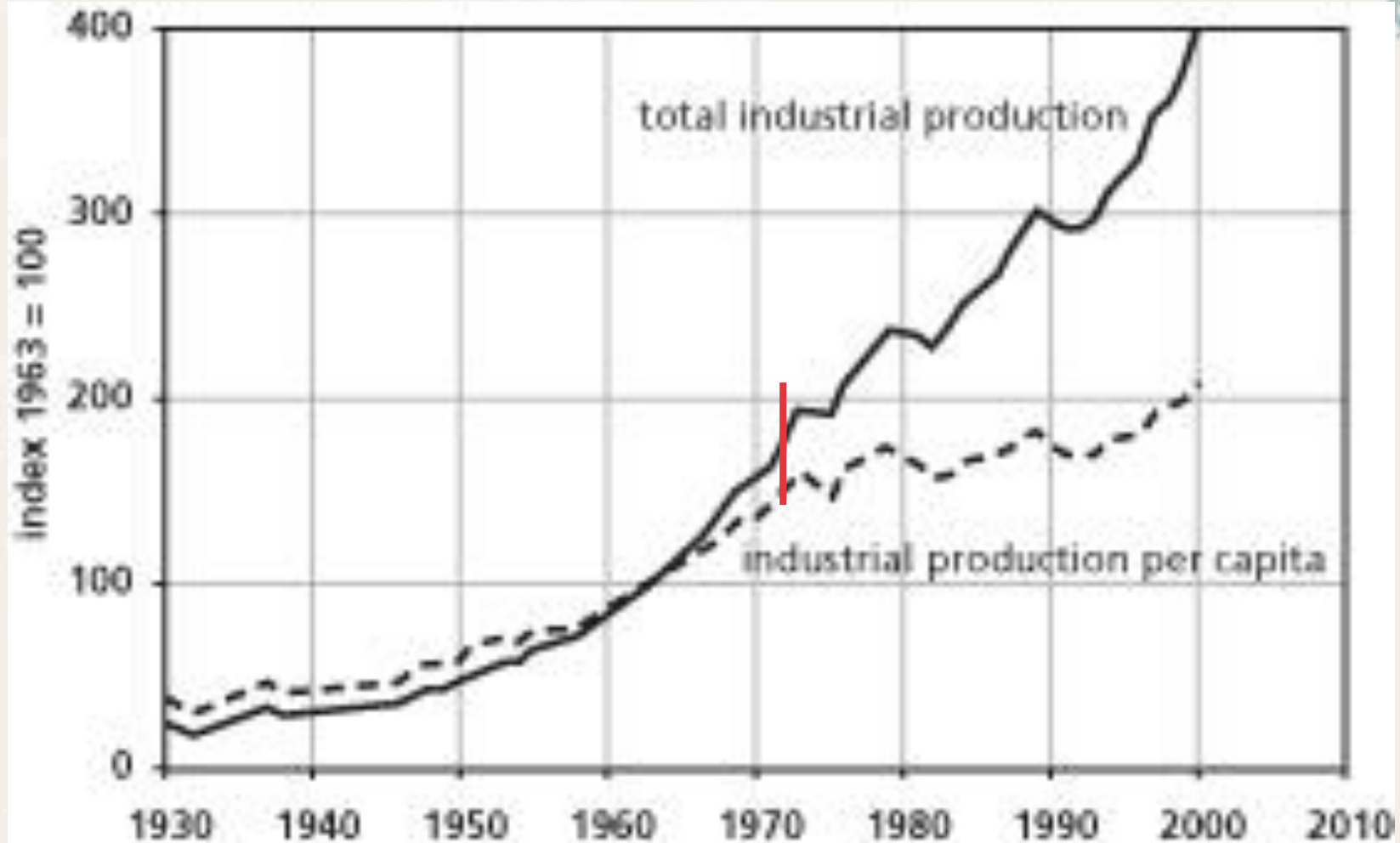


Development – the hopes

- Development means increasing prosperity
- Universal prosperity is possible
- Key player is the economy
- „The tide lifts every boat”
- This is the road to peace



Industrial output 1930 – 2000





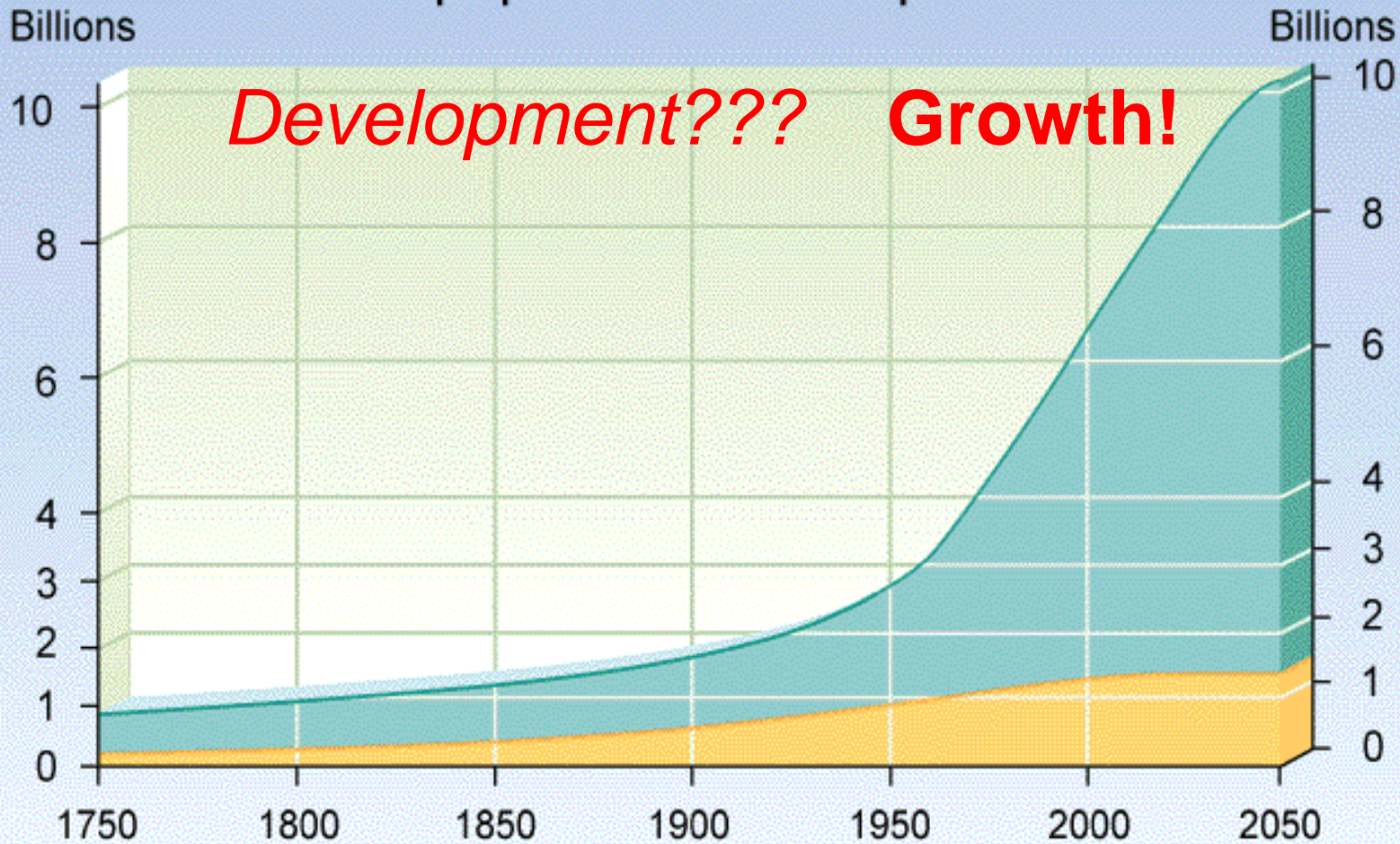
Terminology, definitions, concepts



Did we see

Development
and (?) / or (?)
Growth?



World population development



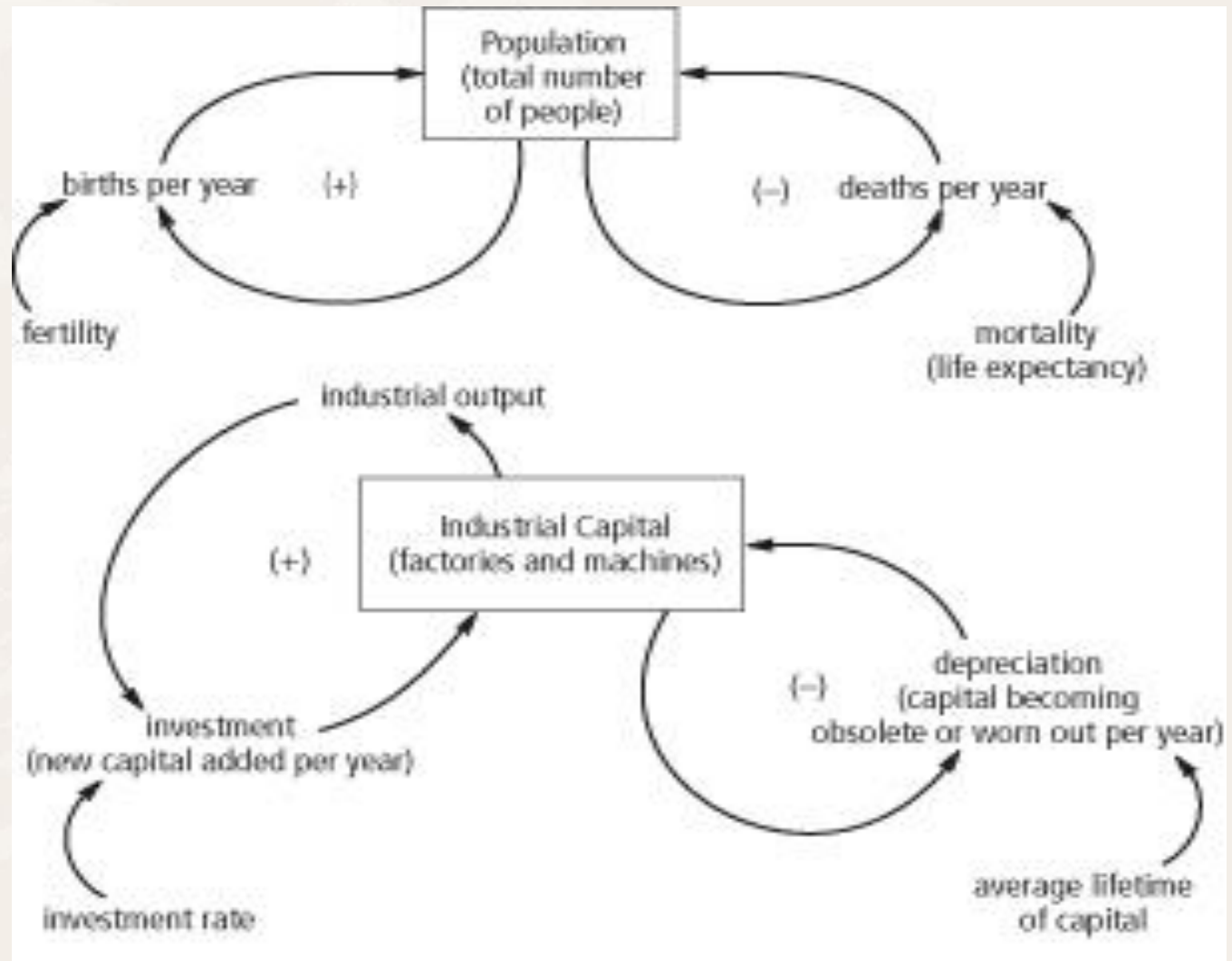
-  Developing countries
-  Industrialized countries





Exponential growth

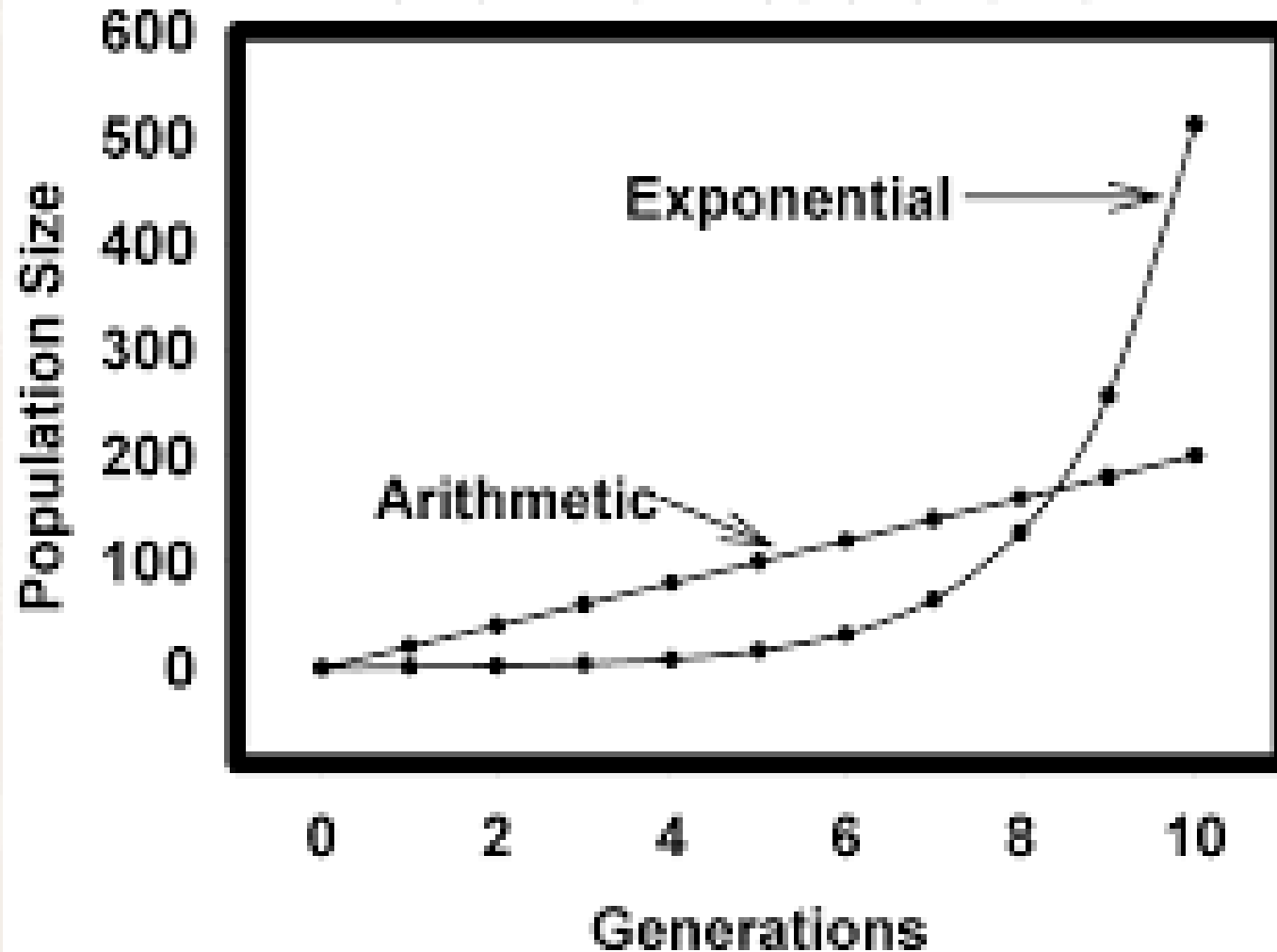
Population



Industrial capital



Comparison of Exponential and Arithmetic Growth



World population trends



*Current and Projected Population Size and Growth Rates**

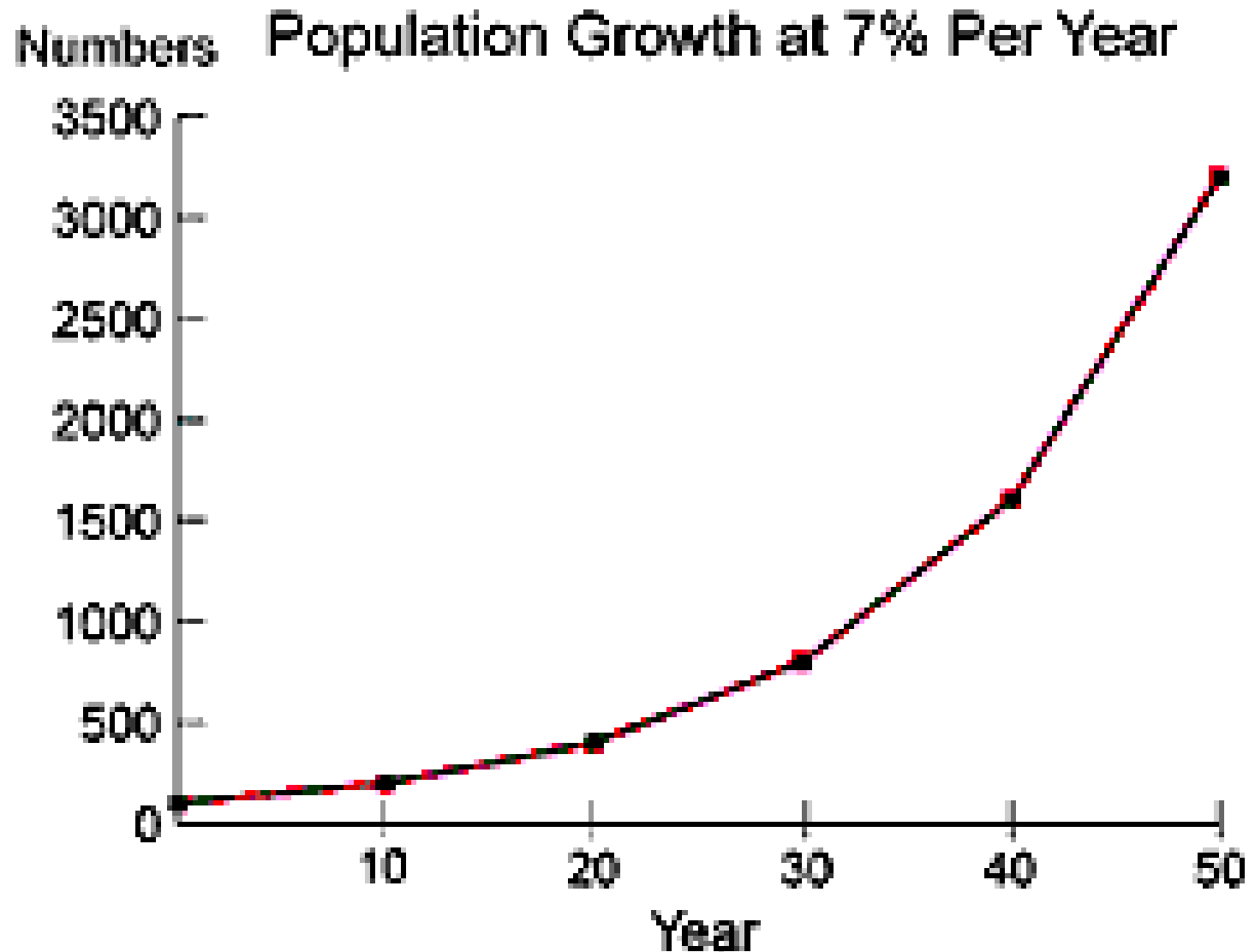
Region	Population (billion)			Annual Growth Rate (per cent)		
	1985	2000	2025	1950 to 1985	1985 to 2000	2000 to 2025
World	4.8	6.1	8.2	1.9	1.6	1.2
Africa	0.56	0.87	1.62	2.6	3.1	2.5
Latin America	0.41	0.55	0.78	2.6	2.0	1.4
Asia	2.82	3.55	4.54	2.1	1.6	1.0
North America	0.26	0.30	0.35	1.3	0.8	0.6
Europe	0.49	0.51	0.52	0.7	0.3	0.1
USSR	0.28	0.31	0.37	1.3	0.8	0.6
Oceania	0.02	0.03	0.04	1.9	1.4	0.9

* Medium-variant projections.

Source: Department of International Economic and Social Affairs, *World Population Prospects: Estimates and Projections as Assessed in 1984* (New York: UN, 1986).



Rule of thumb for calculating doubling times:



**This is a sphere. A globe.
It has a finite surface and volume,
like all other globes we know of...**





The basic question about the sustainability of the real economy has been for a while now:

FOR HOW LONG CAN
MATERIAL GROWTH BE
MAINTAINED
IN ONE OR MORE SUB-SYSTEMS
OF A COMPLEX SYSTEM
OF FINITE MASS AND VOLUME?



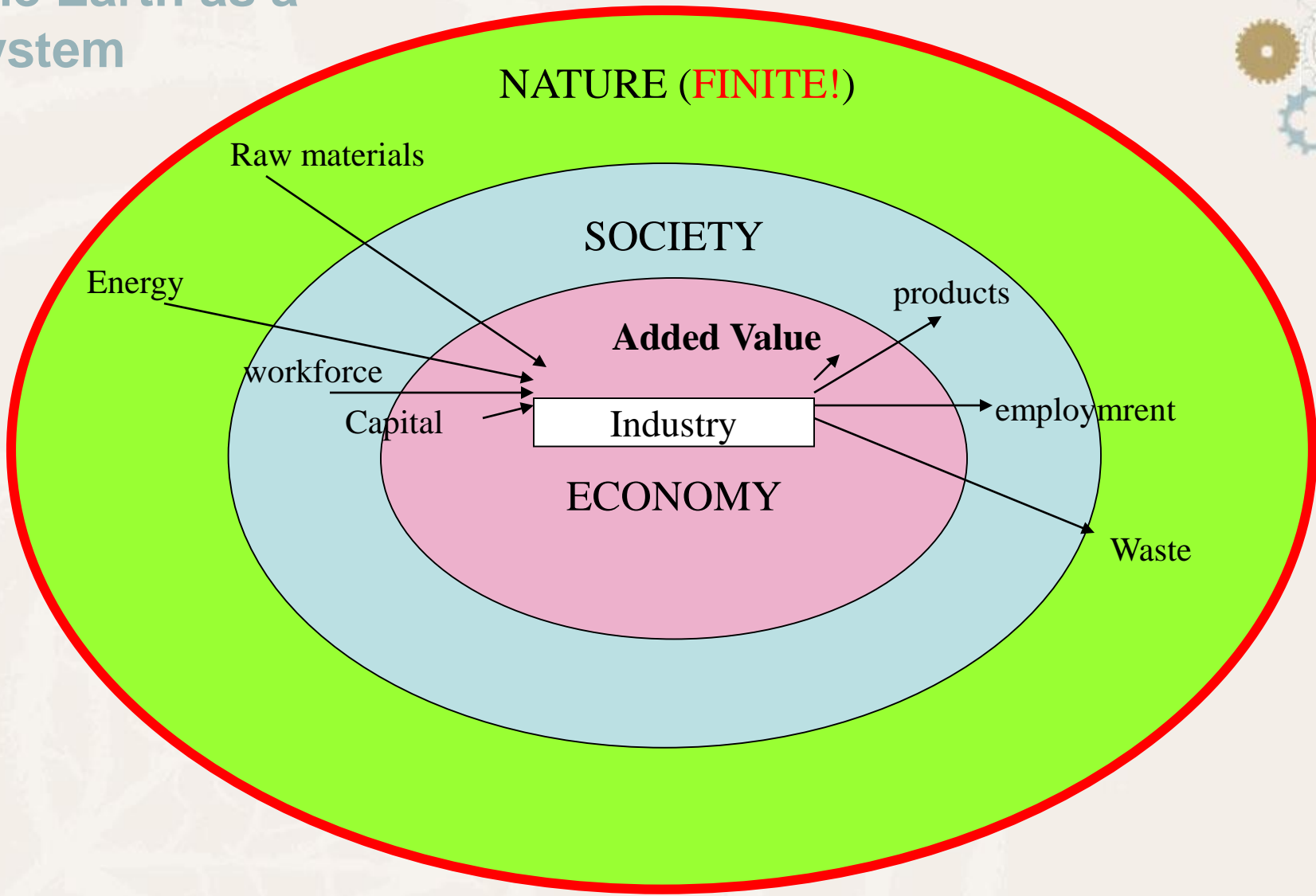
NATURE



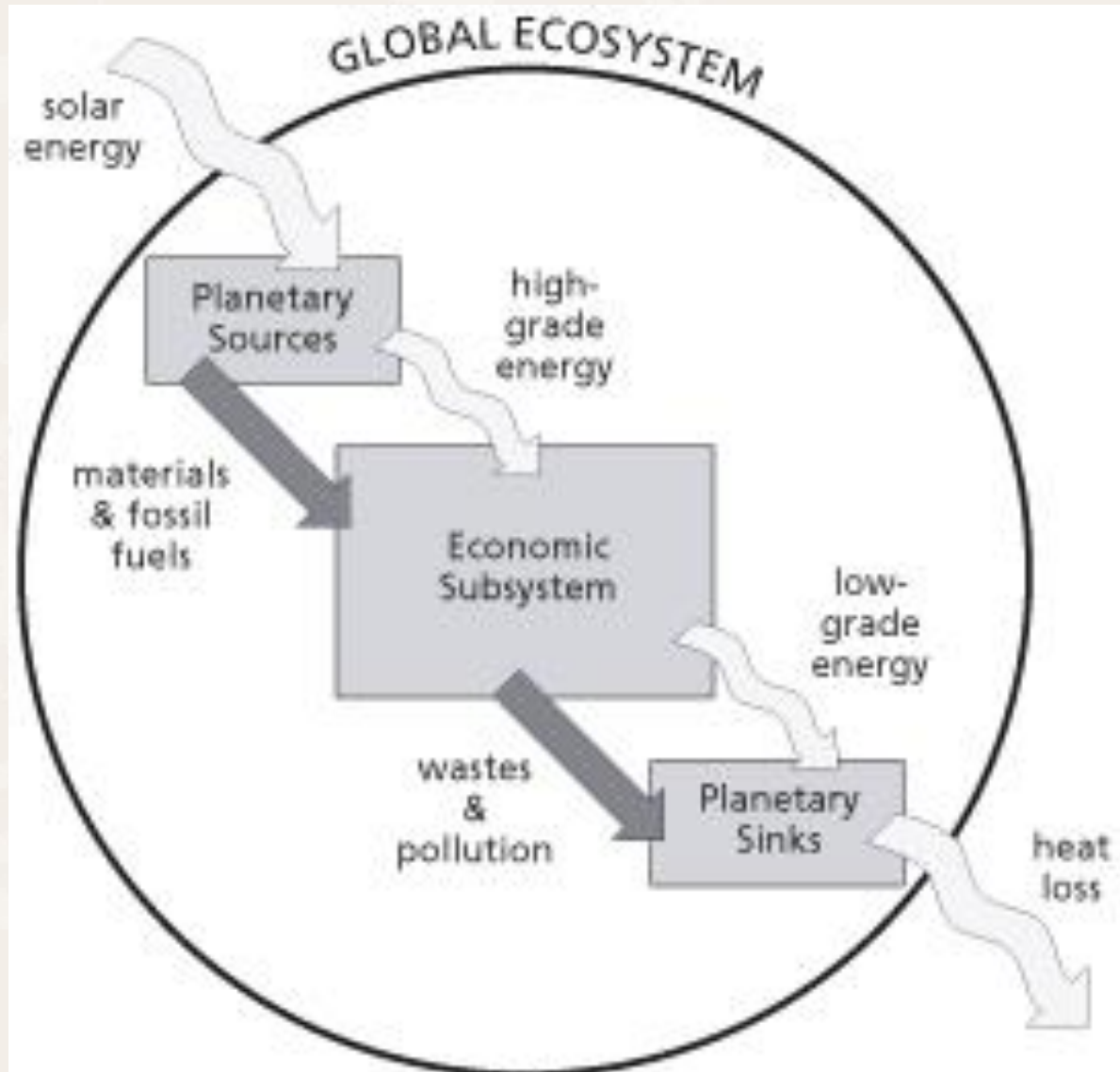
NATURE (ENVIRONMENT)

**SOCIETY
(HUMANKIND)**

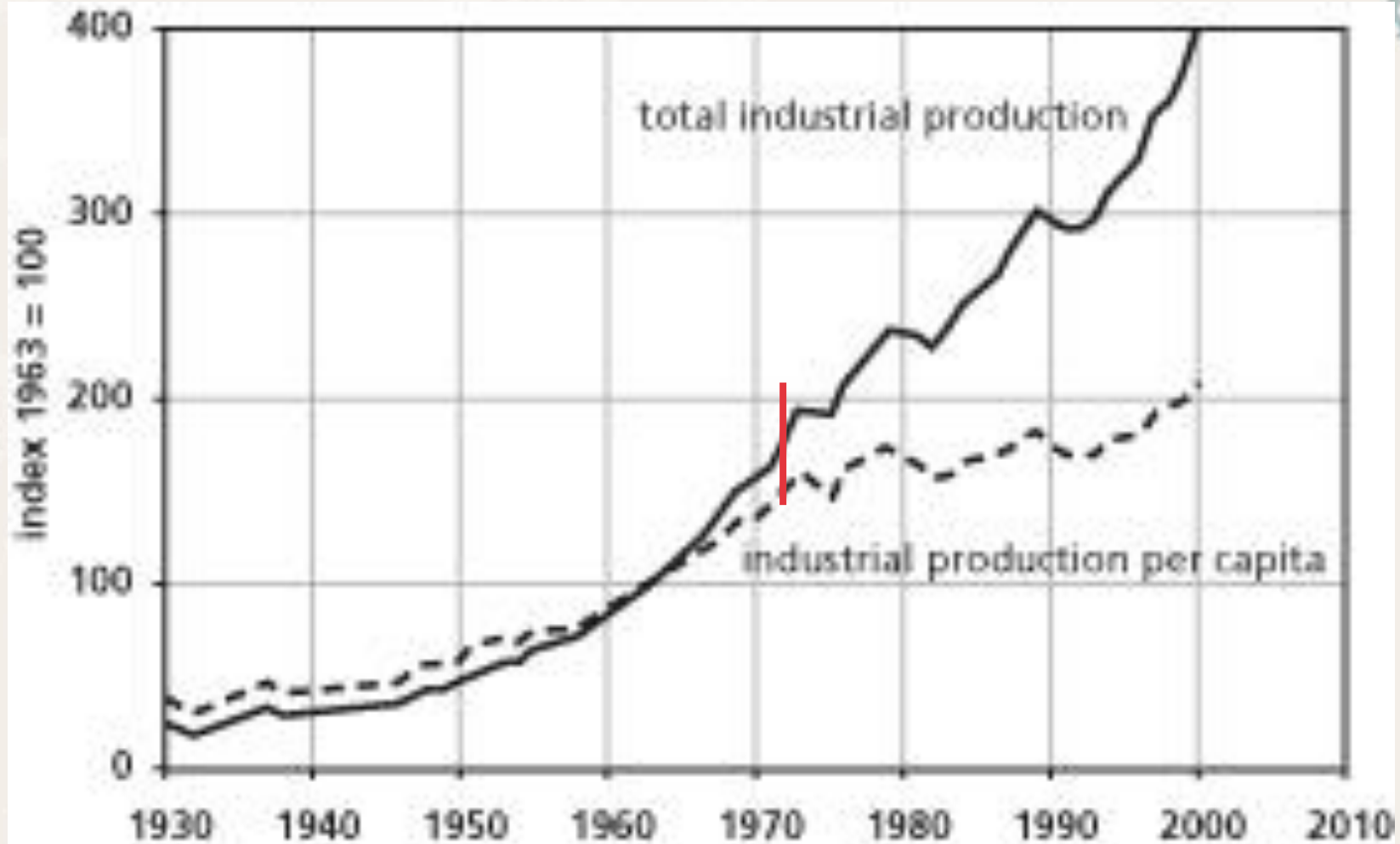
The Earth as a system



Ultimately, linear throughput matters...



...and this grows exponentially!





What is
the *carrying capacity*
of (...a system)?

Do we have enough money?

What are our funds enough for?



Am I short of funds?

We can choose 4!

People
[capita]

Consumption
[goods/capita/year]

Resources (+ interest)
[HUF, interest rate %]

Price level
[HUF/ unit consumption]

Time span
of consumption
[years]



(... to be continued, Feb 26)

...



What is
the *carrying capacity* of ...
(... an ecosystem)?

Do we have enough resources?

What are our resources
enough for?

Carrying capacity

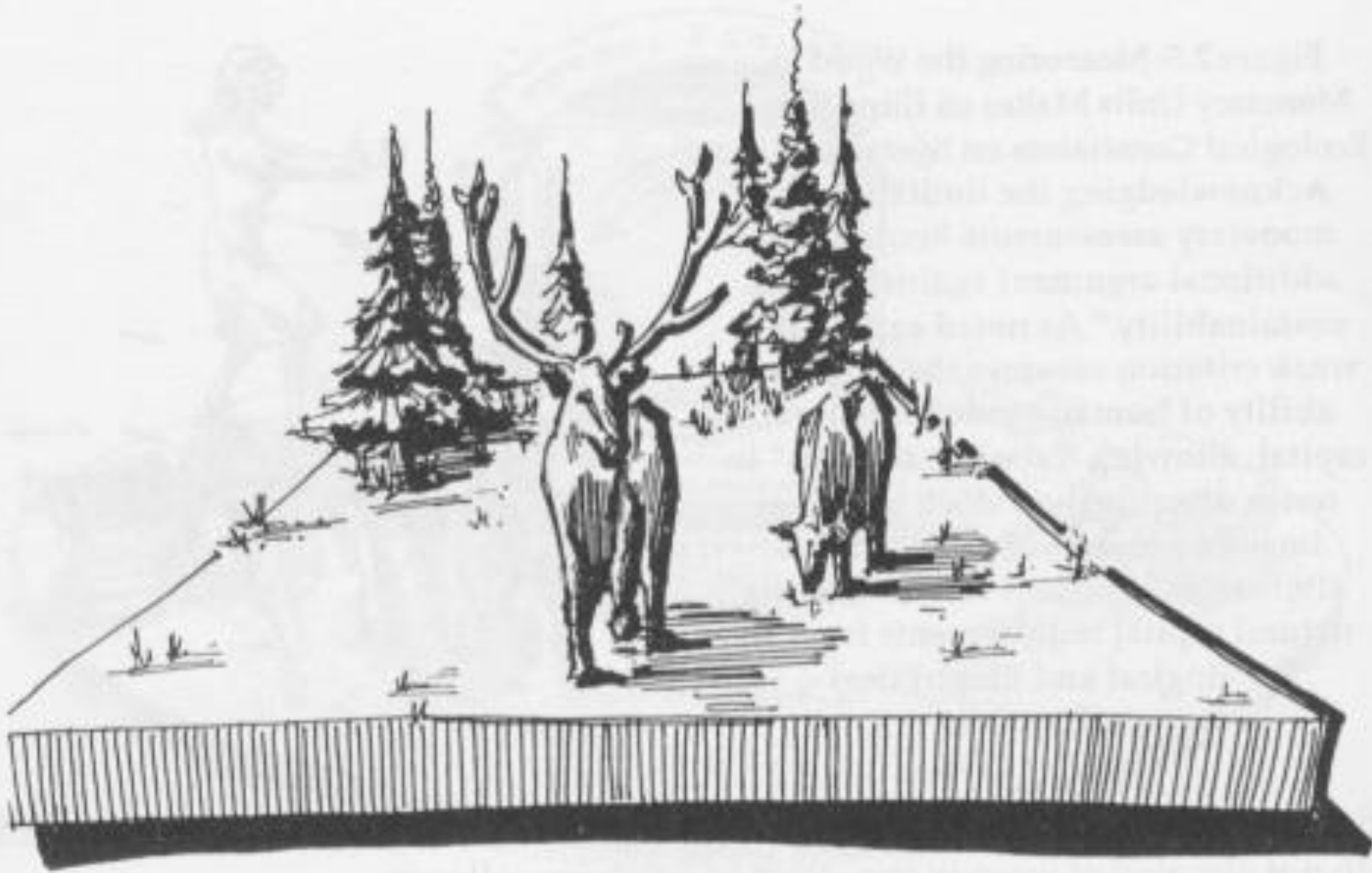


Figure 2.6: Carrying Capacity is traditionally defined as the maximum population of a species that can be sustained indefinitely in a given habitat.



What is
the *carrying capacity* of an
ecosystem)?

How would we calculate it?

Calculating carrying capacity



We can choose 4!

Population
[capita]

Consumption
[unit material/capita/year]

Resources
[stocks, returns/year,
Sink capacity/year]

Technology
[raw materia/unit product]
+ [pollution/unit product]

**Time span
of consumption**
[years]

Space

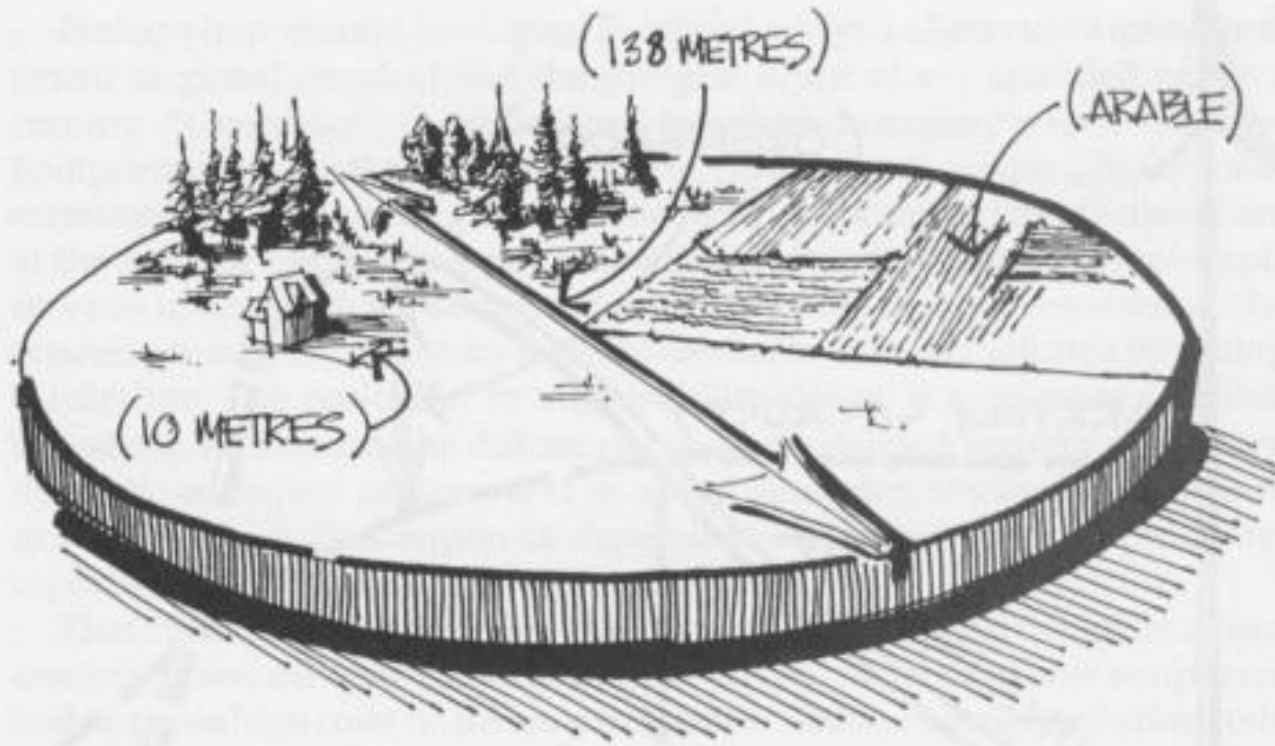


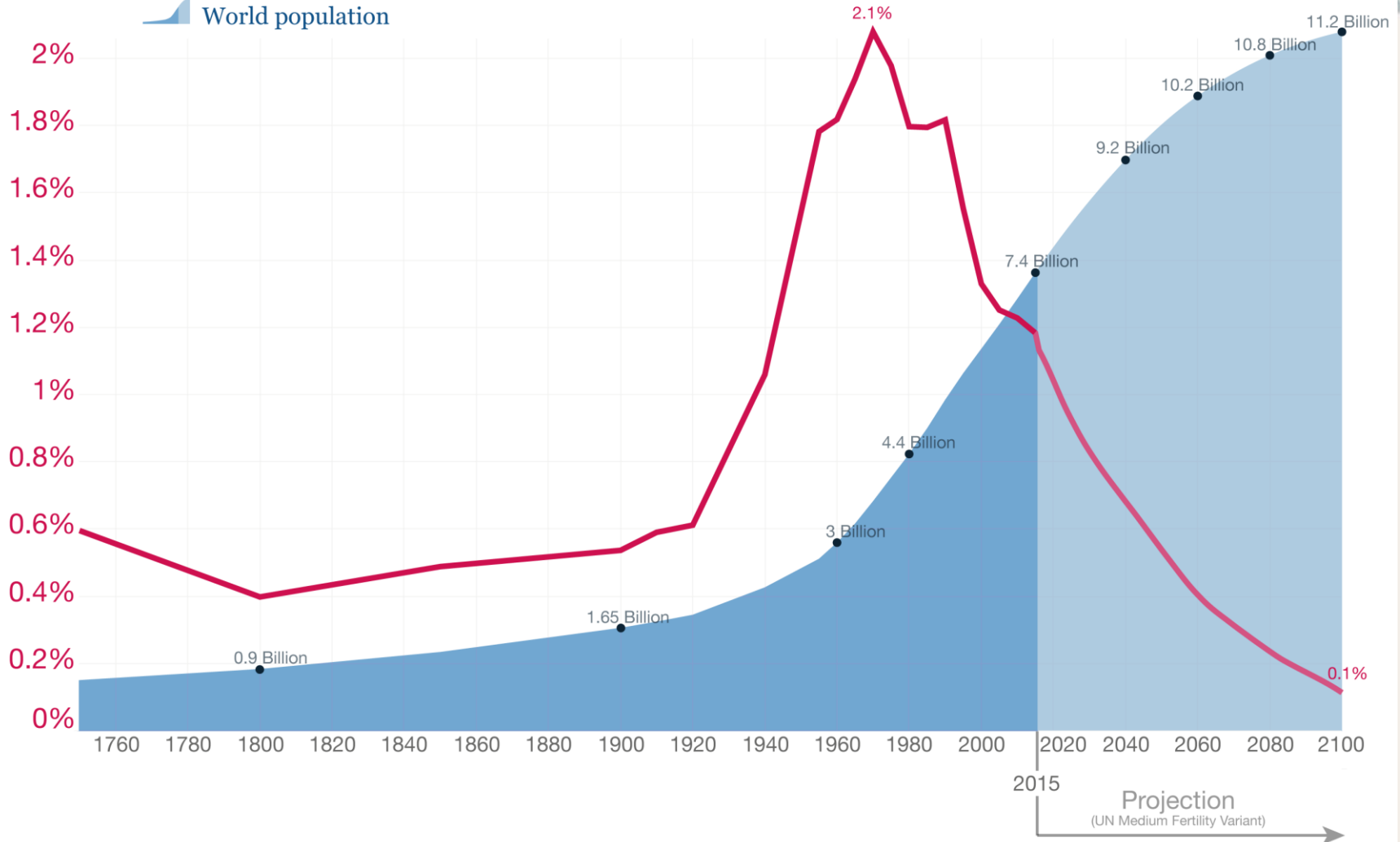
Figure 2.7: A fair Earthshare is the amount of land each person would get if all the ecologically productive land on Earth were divided evenly among the present world population. If your present Earthshare were a circular island it would have a diameter of just 138 metres. One sixth of your island would be arable land, the rest pasture, forest and wilderness, and built-up area. Clearly, as the population increases, our earthshares shrink. Also, for each person whose Ecological Footprint exceeds his/her fair earthshare by, say, a factor of three (as do North Americans'), three other people would have to content themselves with only a third of a share for global sustainability. —Any volunteers?



Our World in Data

World population growth, 1750-2100

Annual growth rate of the world population
World population



Data sources: Up to 2015 OurWorldInData series based on UN and HYDE. Projections for 2015 to 2100: UN Population Division (2015) – Medium Variant. The data visualization is taken from [OurWorldInData.org](https://ourworldindata.org). There you find the raw data and more visualizations on this topic.

Licensed under CC-BY-SA by the author Max Roser.



Sept 23



SO WHO DRIVES THE CONSUMPTION OF RESOURCES?



World Population Percentages

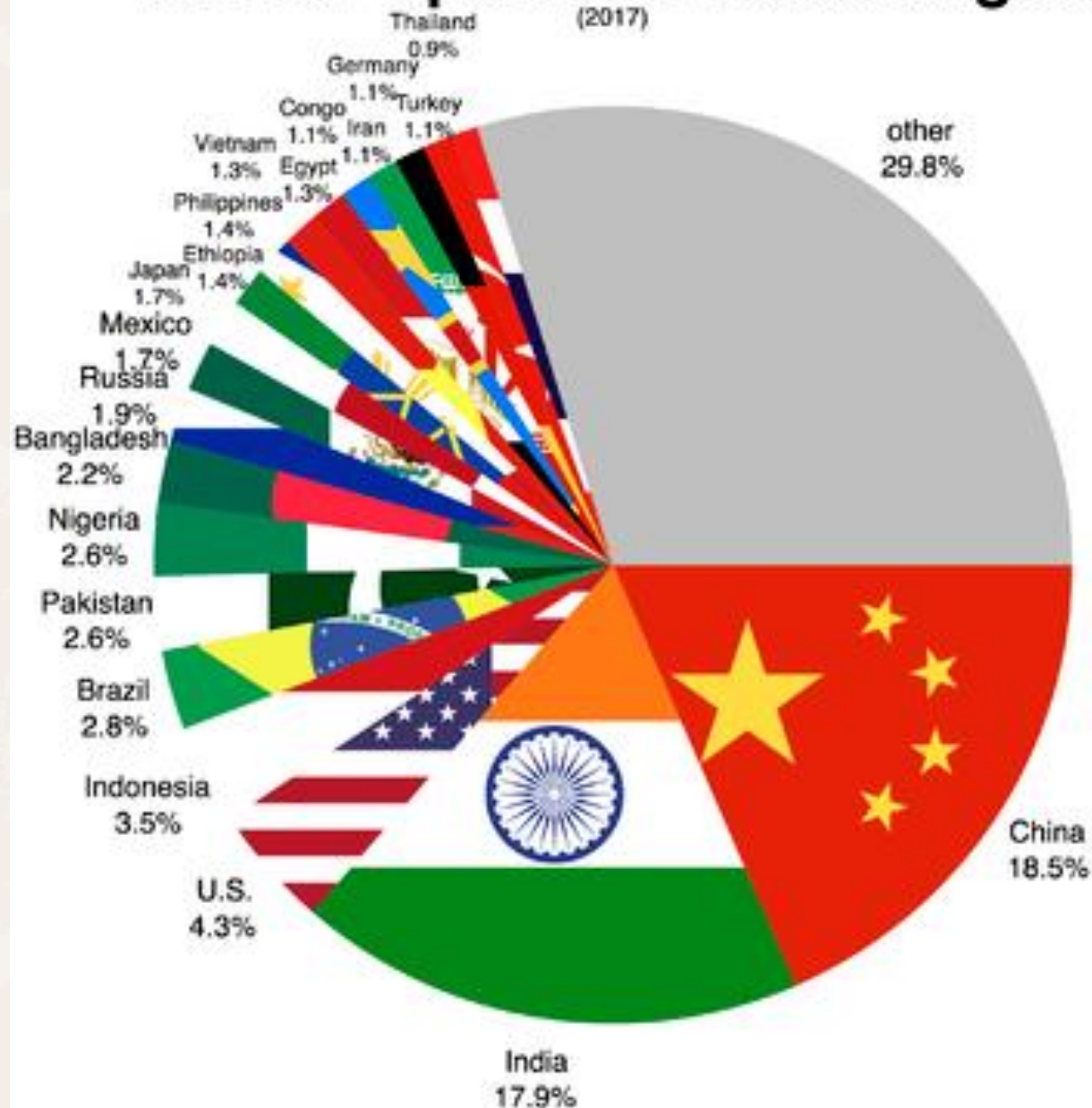
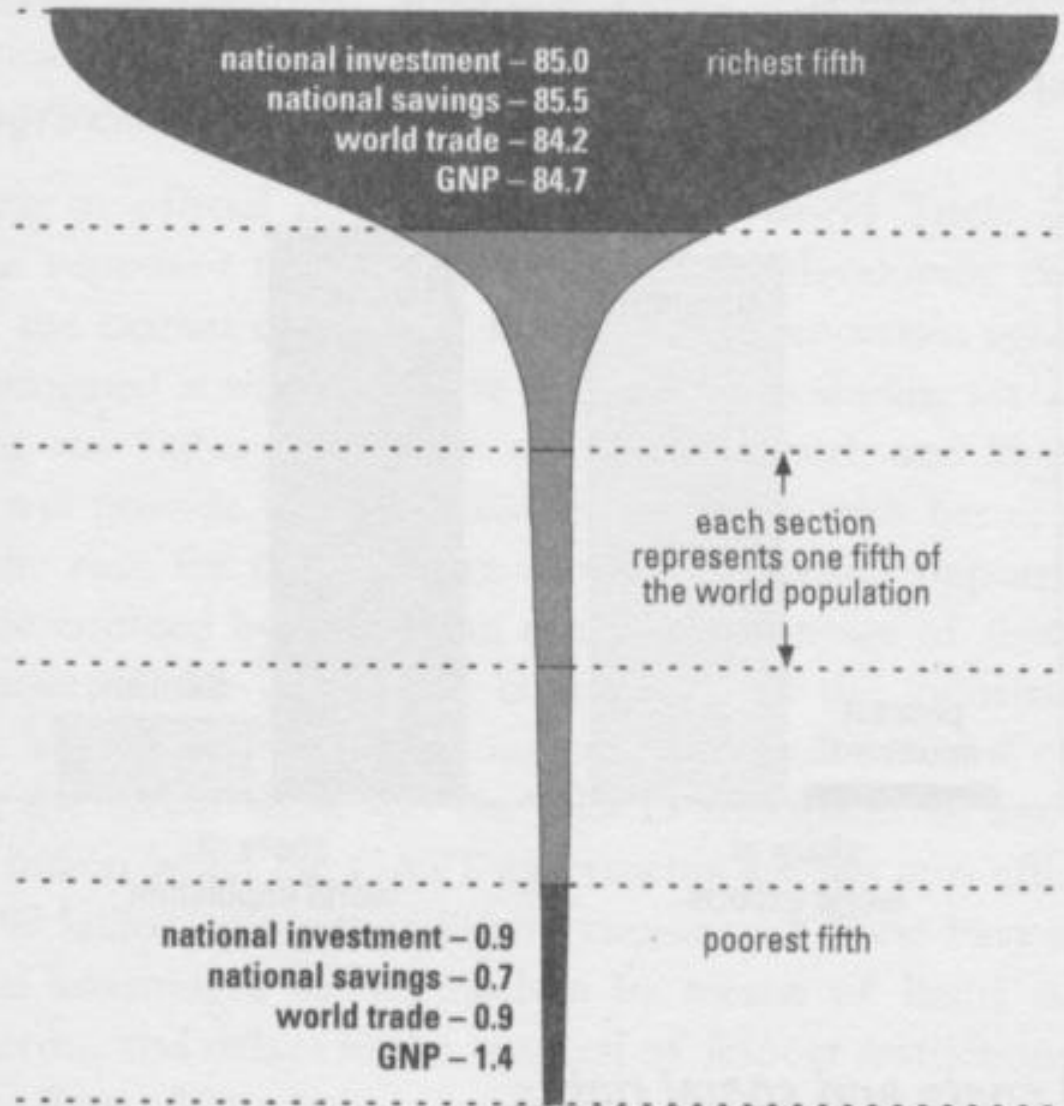
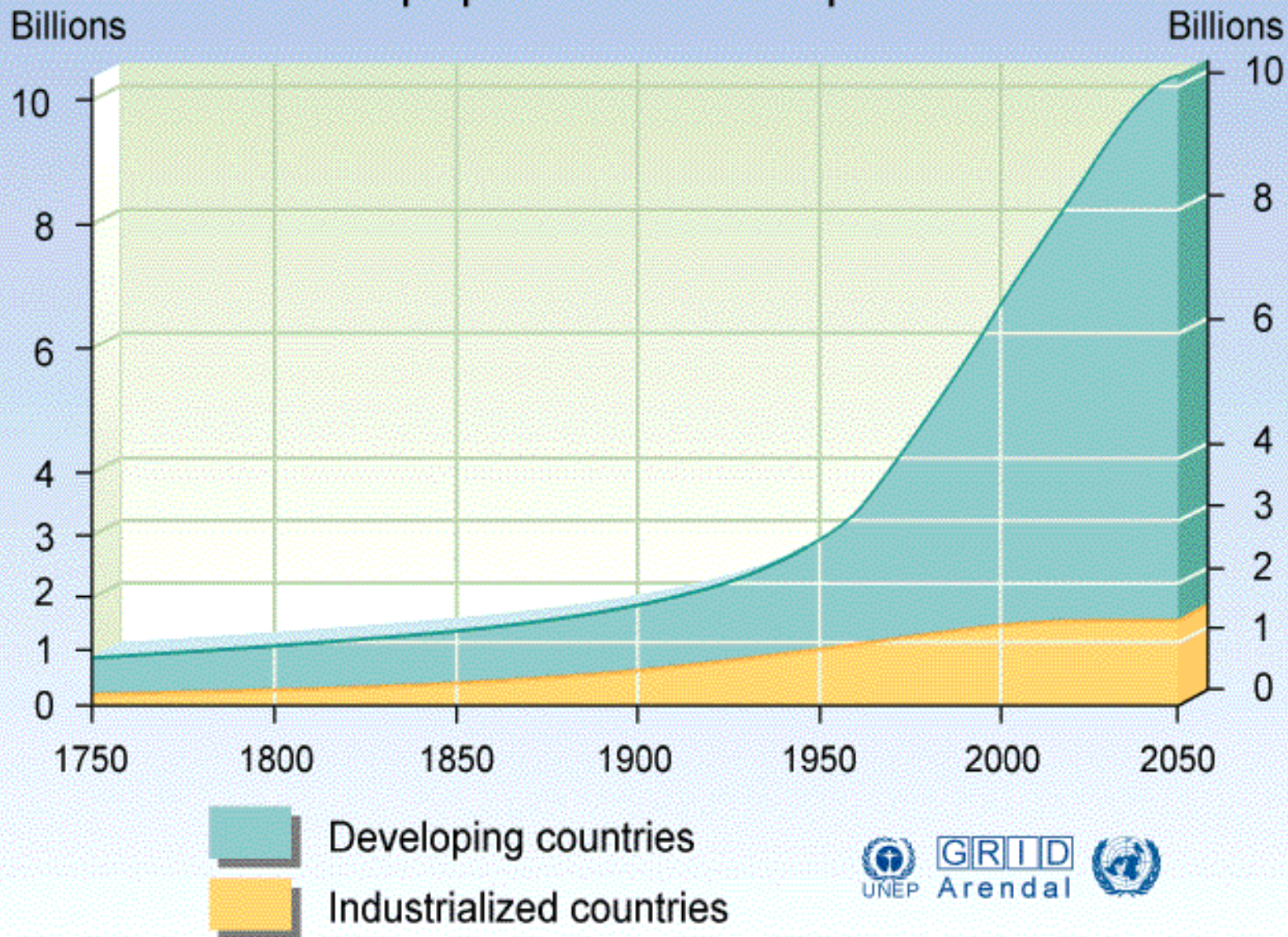


Figure 7.2 Distribution of economic activity between North and South, 1991
(% of global total) (Source: UNDP, 1994)

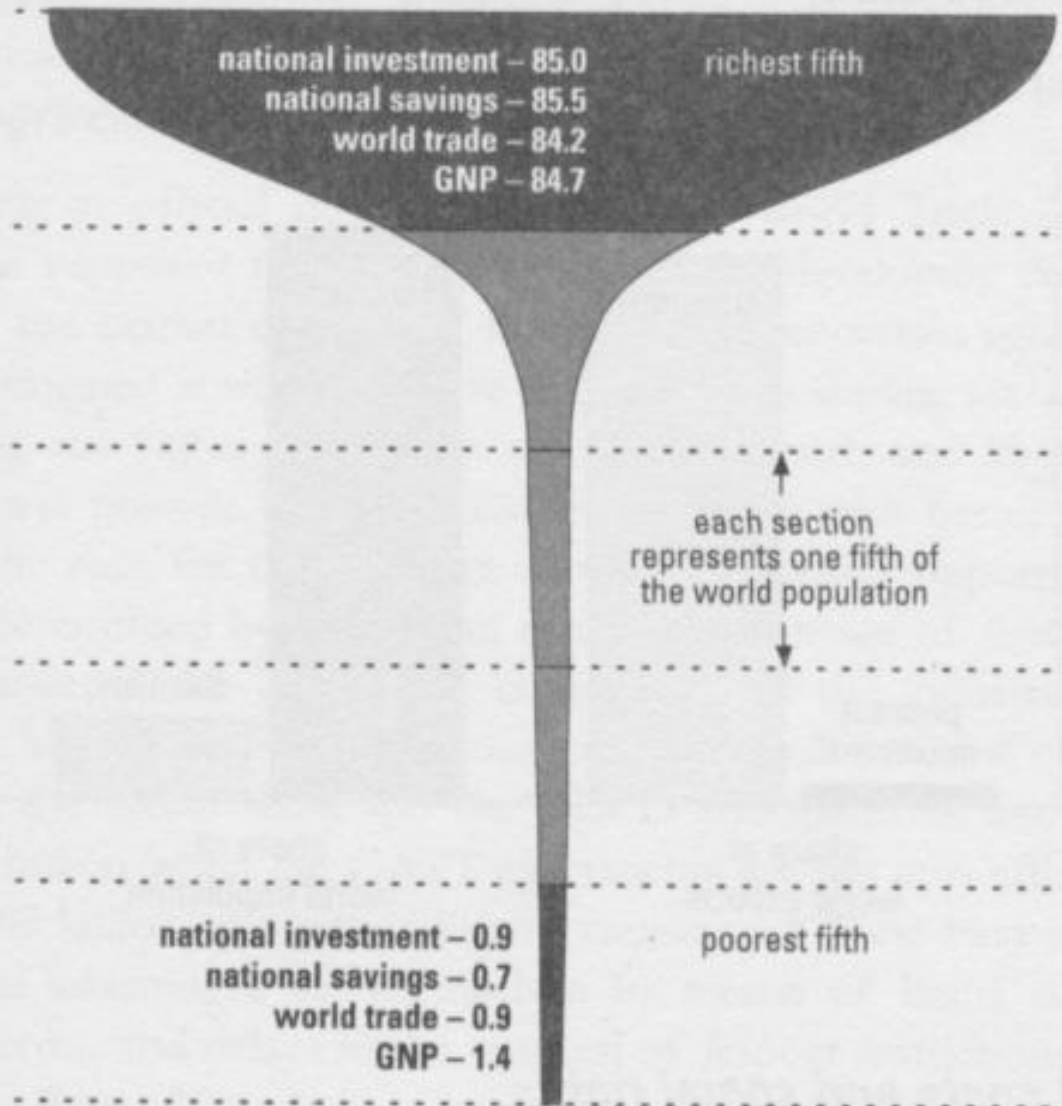




World population development



20% ARE RESPONSIBLE FOR >85%!



Footprint



A useful way of looking at our own share,
responsibility...

What is the ecological footprint,
How could it be defined?

Footprint

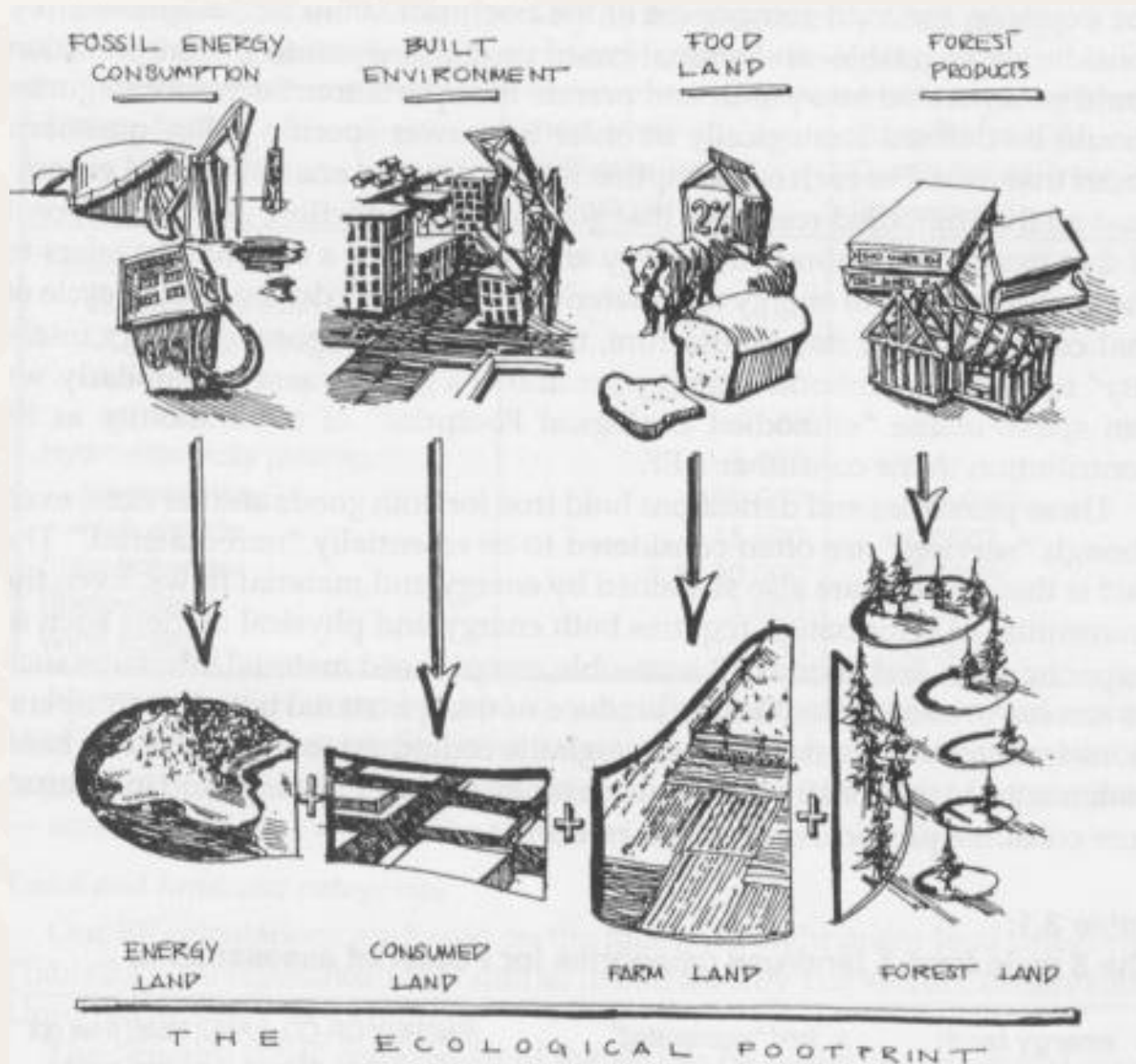


The „ecological footprint” of a person or a group is the demand on the renewable natural capital calculated from the material flow (throughput) their way of life (consumption) generates.

It is the quantity, composition and location (pattern) of natural capital – sources and sinks - the yearly returns of which exceed the yearly demand of this consumption.

It is expressed in hectares/capita.

Footprint





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Assignment 2.

<https://www.footprintnetwork.org/resources/footprint-calculator/>

<https://www.footprintcalculator.org/> > <https://footprint.wwf.org.uk/#/> >

<https://footprintcalculator.henkel.com/en>

<https://www.nature.org/en-us/get-involved/how-to-help/consider-your-impact/carbon-calculator/>

Please study these websites carefully, and calculate your footprint with at least two methods!

I would like to have your most important thoughts regarding

- How big is your footprint? How do you feel about your results?
- How do you compare with your own national average, and with other nations?
- Where is the possibility for the largest cut? Where is the possibility for the easiest cut? Please always explain!

2 – 4 pages, A4, TimesNewRoman 12, line spacing 1.5

*Send to: **csizik.zoltanne@jak.ppke.hu***

If you use resources other than your own brain, pls reference them.

DO NOT COPY ANYTHING, pls.



Assignment 2.

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Assignment 2.

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Carrying capacity

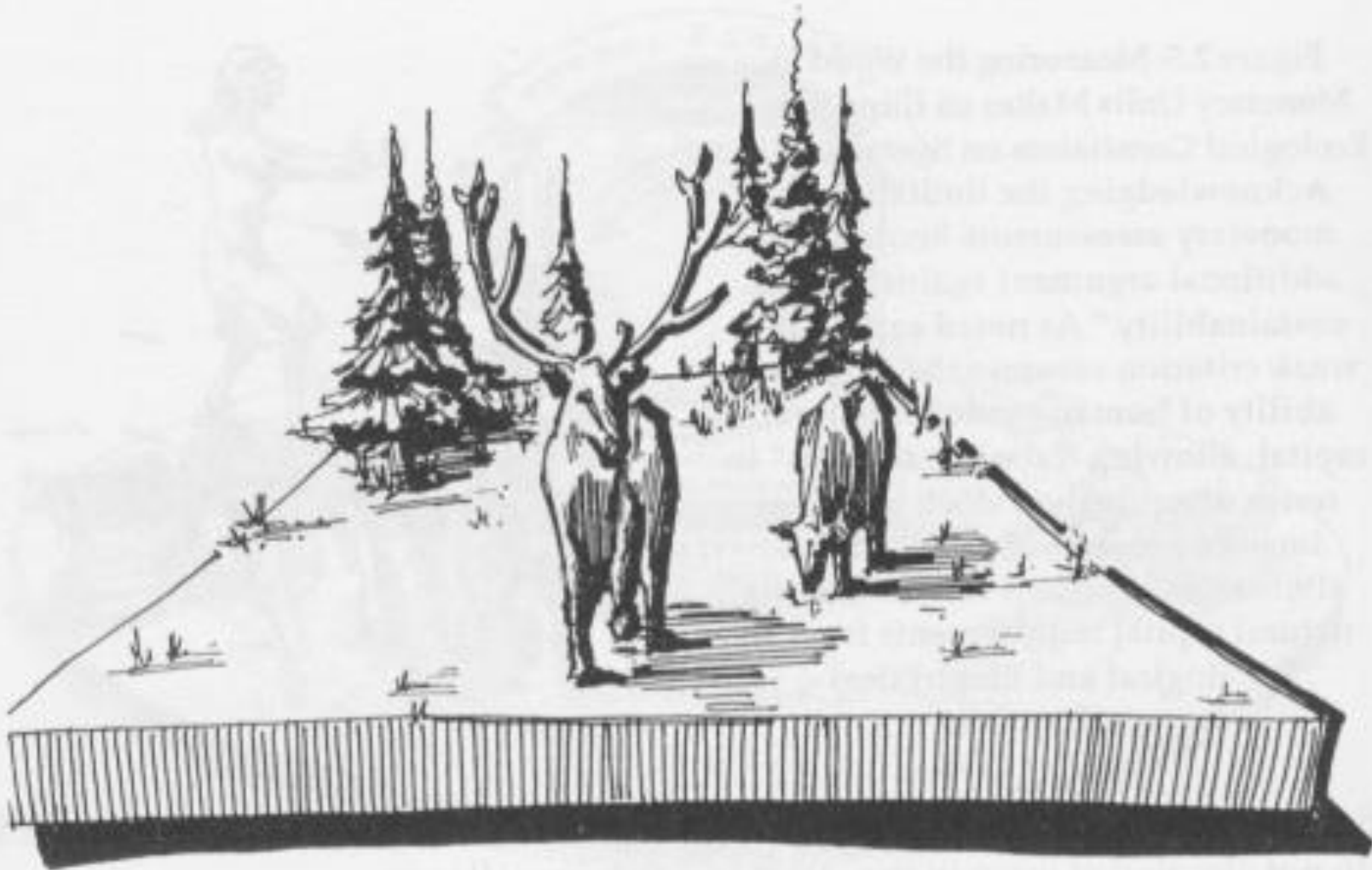
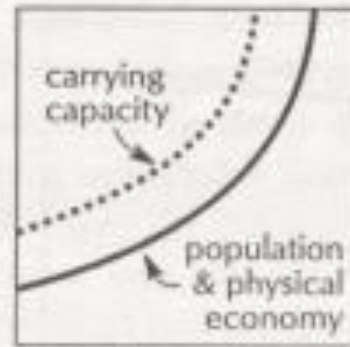


Figure 2.6: Carrying Capacity is traditionally defined as the maximum population of a species that can be sustained indefinitely in a given habitat.

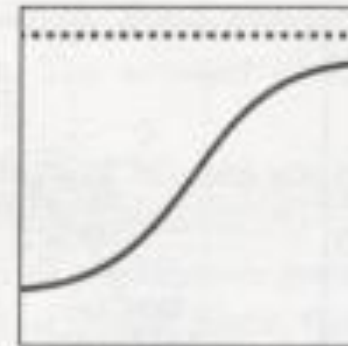
Approaching carrying capacity



Stable

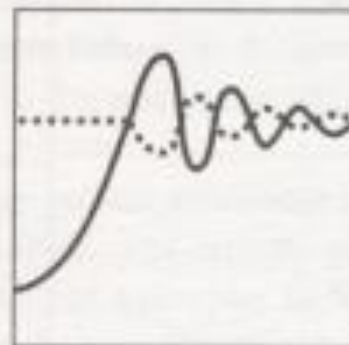


time →
Continuous growth

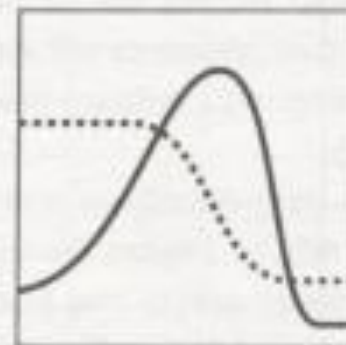


Sigmoid approach to equilibrium

Unstable



Overshoot and oscillation



Overshoot and collapse

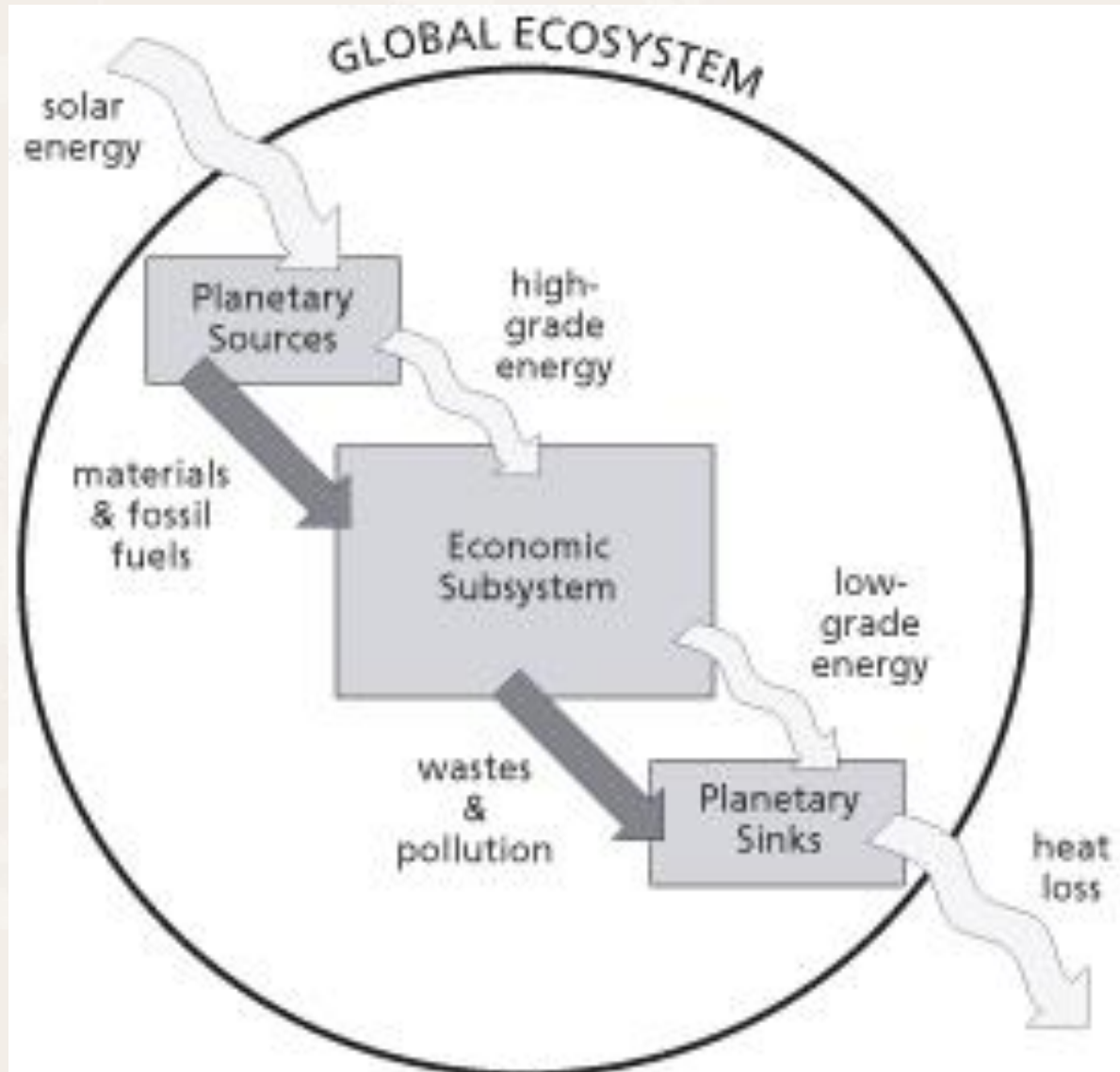
The central question addressed by the World3 model is: Which of these behavior modes is likely to be the result as the human population and economy approach their carrying capacity?



World stocks' and flows' trends are influenced by political priorities!

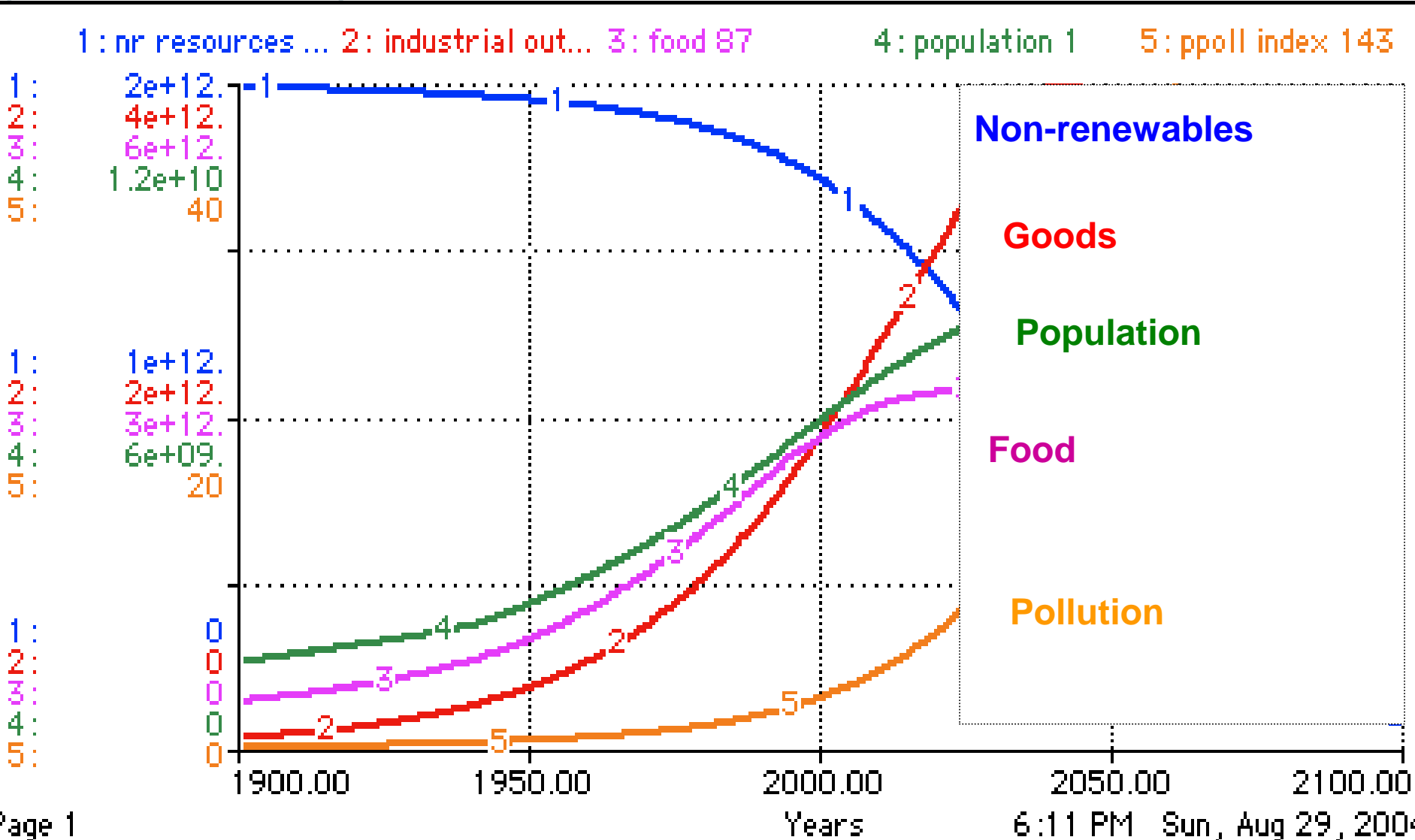
The main political priority since the 1970-ies has been to promote the exponential increase of the real economy of every country, i.e. the throughput of energy and materials from nature (raw materials) through the economy back into nature (waste).

Ultimately, linear throughput matters...



De facto trends till 2018...

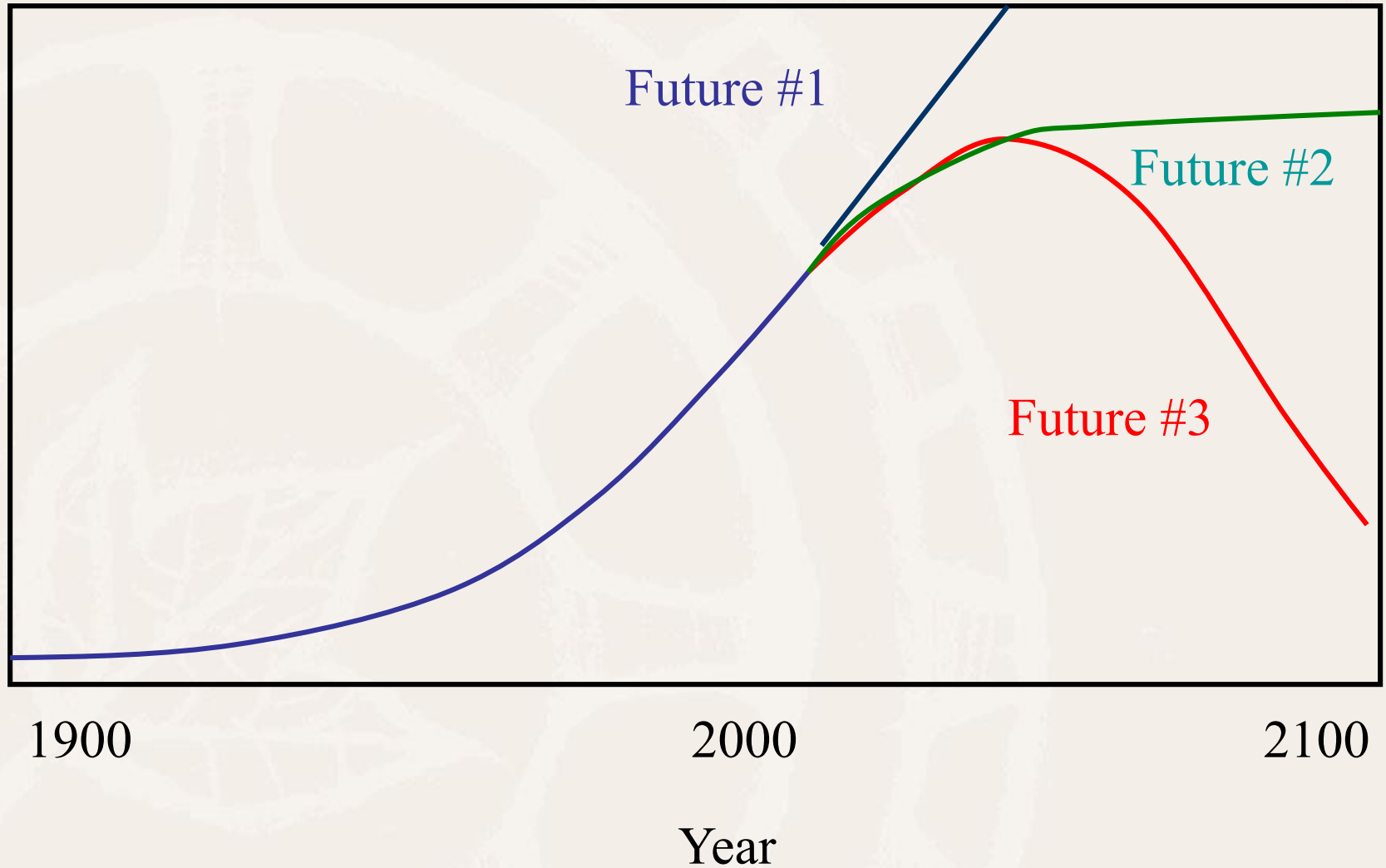
(Dennis Meadows)





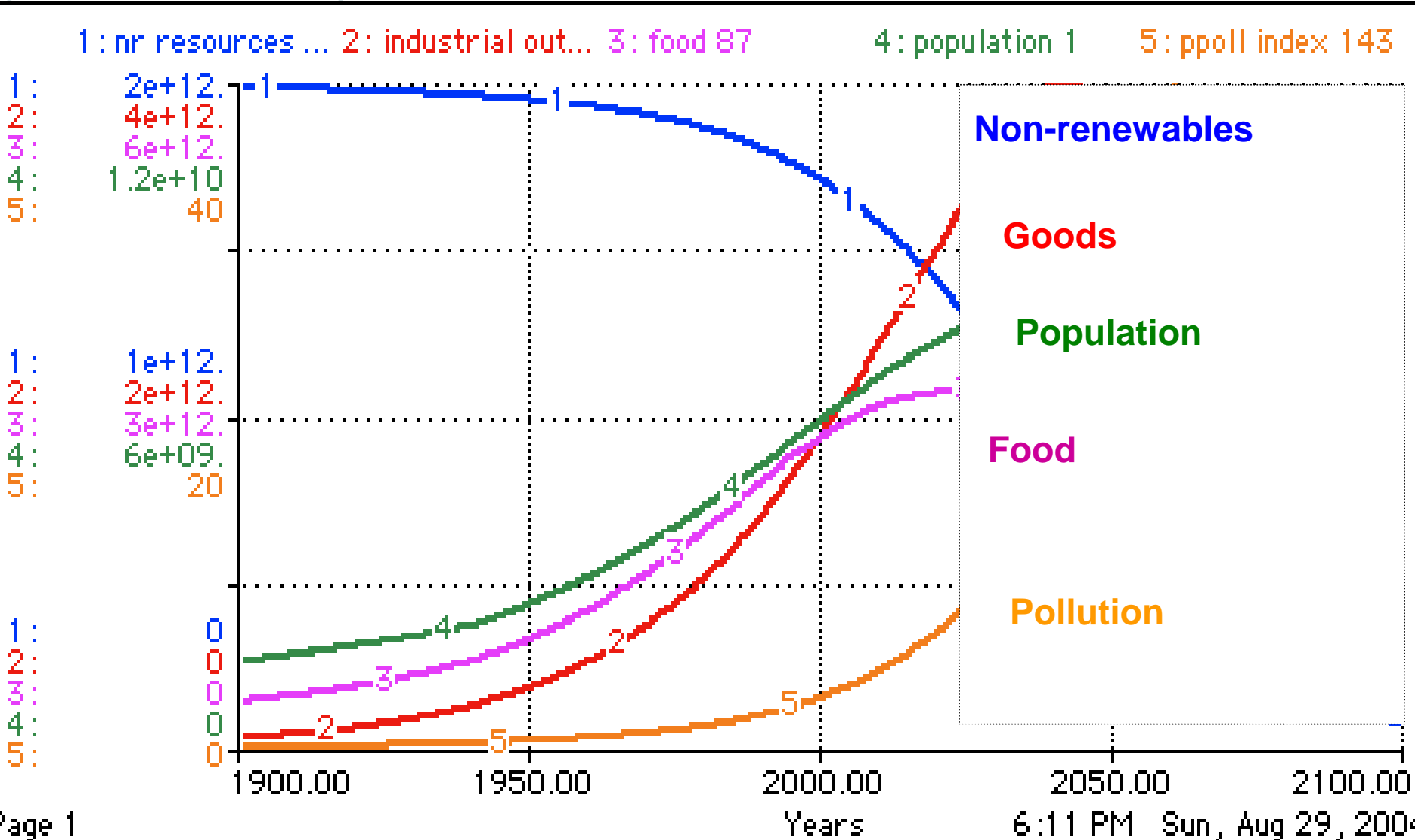
What do you expect
of the future?

Three Possible Futures

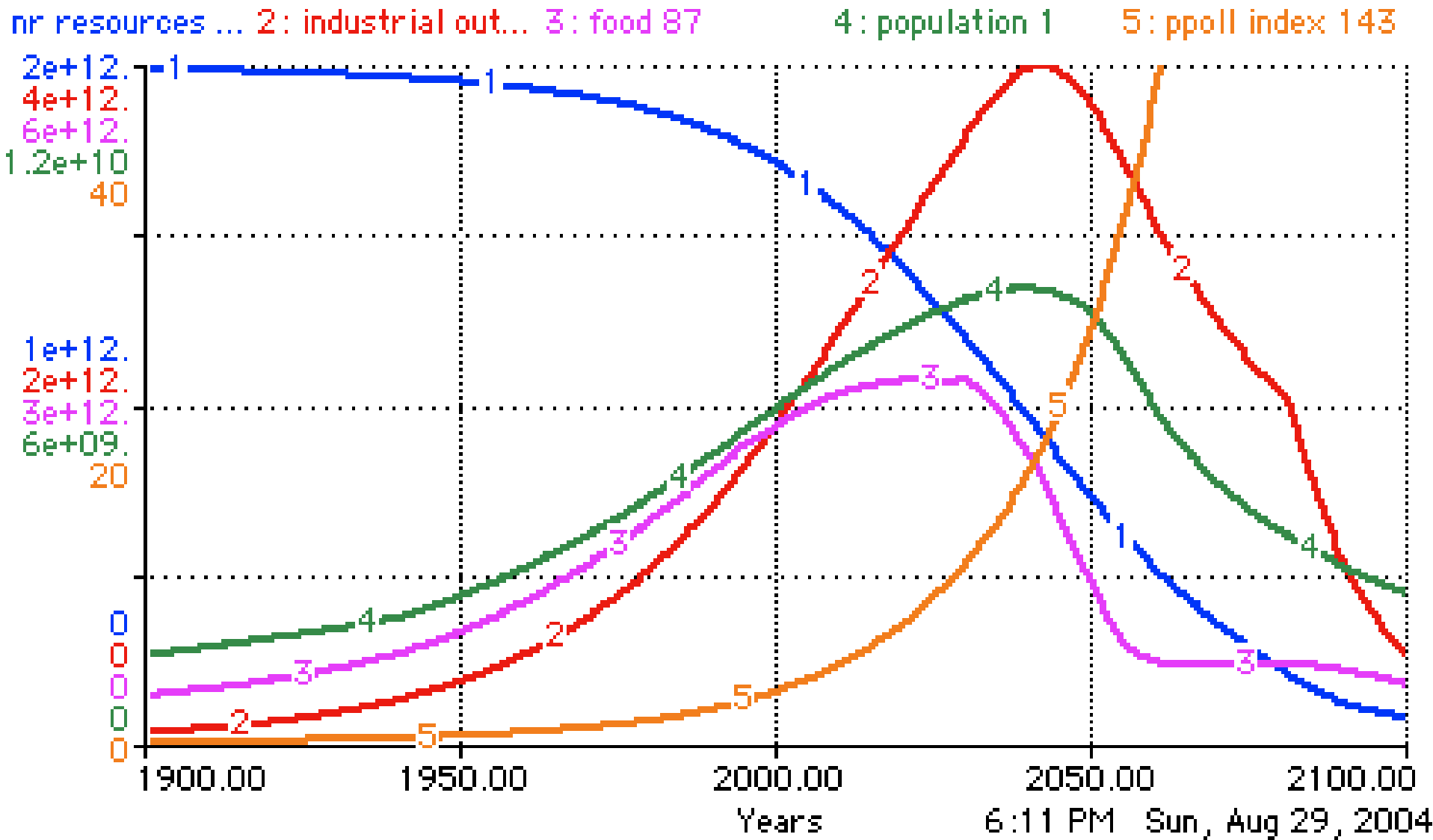


De facto trends till 2018...

(Dennis Meadows)



...and projected till 2100!



?

Terminology, definitions, concepts



What do model runs,
scenarios mean:

Forecast or prophecy?

Inevitability or conditionality?



WHY SHOULD WE BELIEVE MODELS?

WHEN SHOULD WE BELIEVE MODELS?

WHAT ARE THEY GOOD FOR?

WHEN ARE THEY GOOD?

(let us take a look – W+ slides)



DEMAIN

(... to be continued X 07)

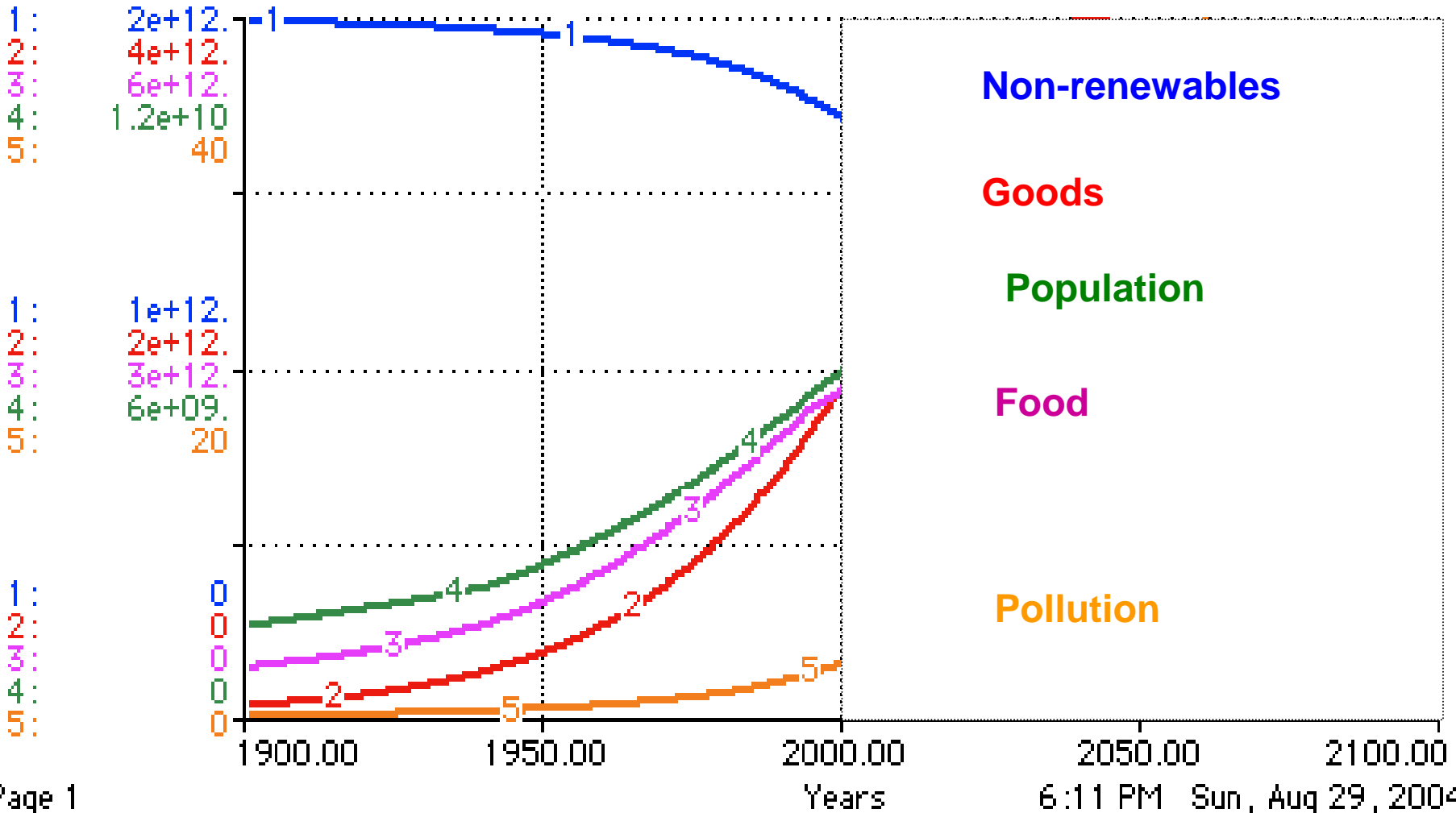


Is overshoot
and collapse
inevitable?

De facto trends till 2000 were exponential...

(Dennis Meadows)

1: nr resources ... 2: industrial out... 3: food 87 4: population 1 5: ppoll index 143

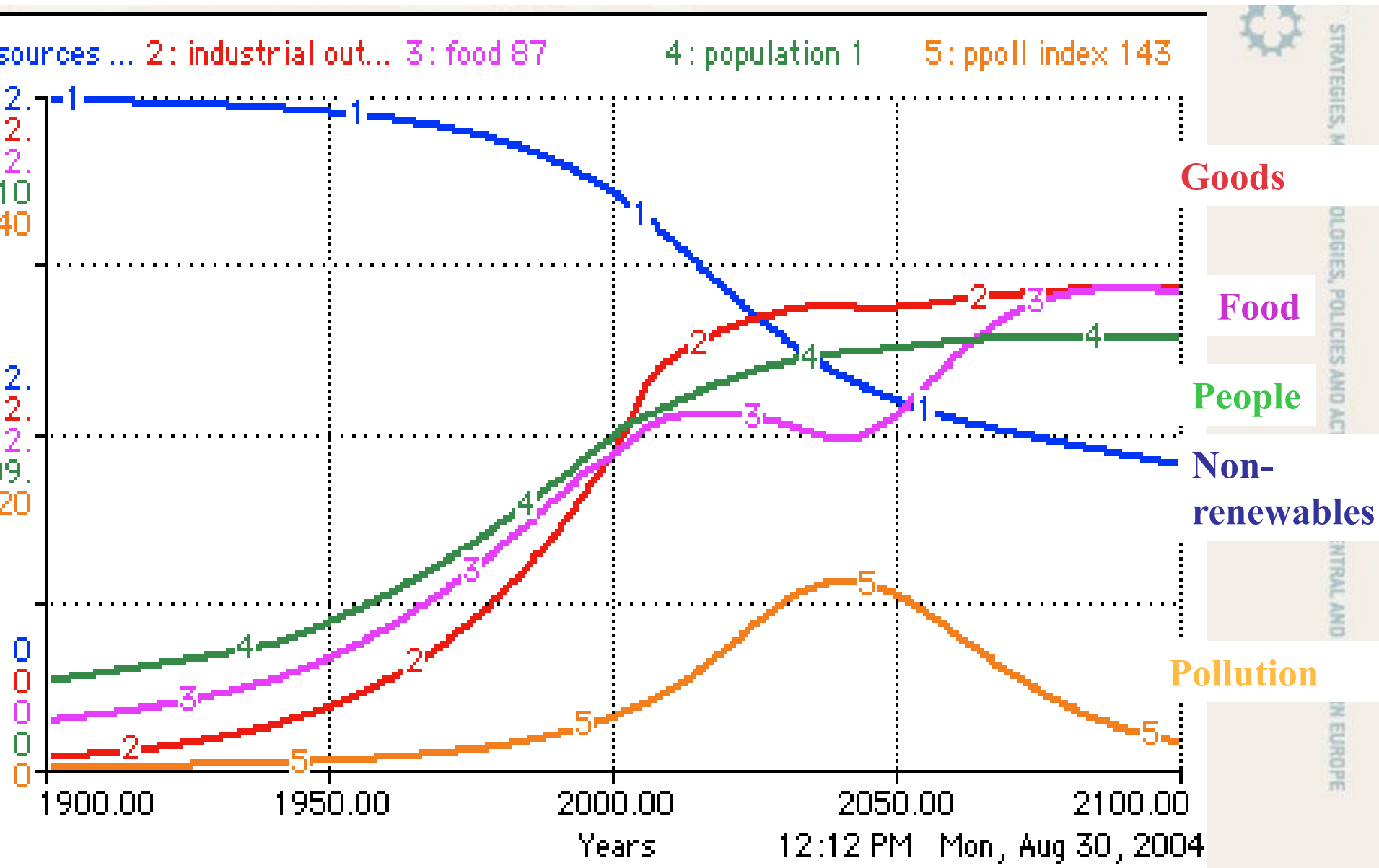


STRATEGIES, METHODOLOGIES, POLICIES AND ACTIONS FOR CENTRAL AND EASTERN EUROPE



... yet a stable outcome was still an option !

(Dennis Meadows)



STRATEGIES, M

OLOGIES, POLICIES AND ACT

NTIAL AND

IN EUROPE

Goods

Food

People

Non-renewables

Pollution



Decisive, thorough, swift change of political priorities could change the outcome!

- Stabilize population
- Put ceiling on material throughflow and also
- Prefer energy- and resource-saving technologies
- Prevent polluting the environment
- Raise agricultural productivity
- Protect nature



Terminology, definitions, concepts

Development

Growth (linear, exponential)

Population (changes)(trends)

„Enough”, carrying capacity, (approach to)

Ecological footprint

Natural resource base, capital

System(s) (parts of)(structure of)

Model, forecast