

Swedish Aral Sea Society



Karakalpak State University

1. Sustainable Development

How did it start?

What is it?

Lars Rydén

Professor Emeritus

Uppsala University, Sweden

**Master Course on Sustainable Development and Sustainability Science
For Uzbekistan by SASS and Karakalpak State University Spring 2026**

The forest crisis in Europe 1700s



How to deal with resource crisis

Methods are the same today.

1. **Management skills**

as in the handbook on forestry

2. **Technical solutions**

as the channelized stove and insulation of buildings

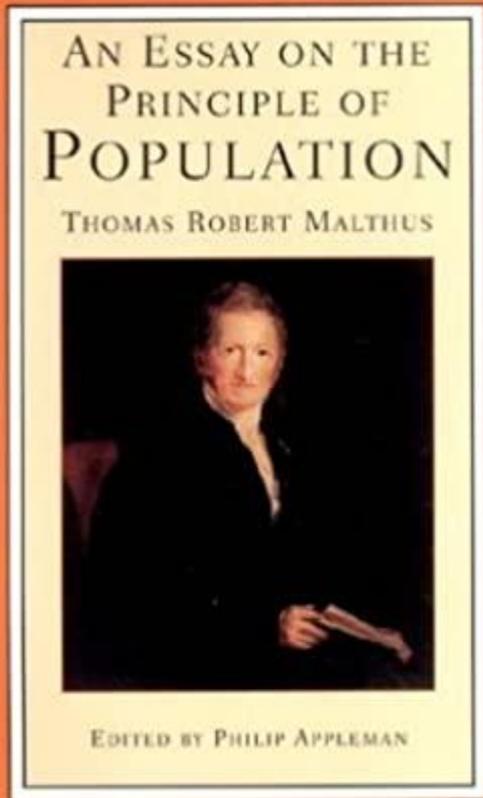
3. **Substitution**

for example by the use of peat instead of wood

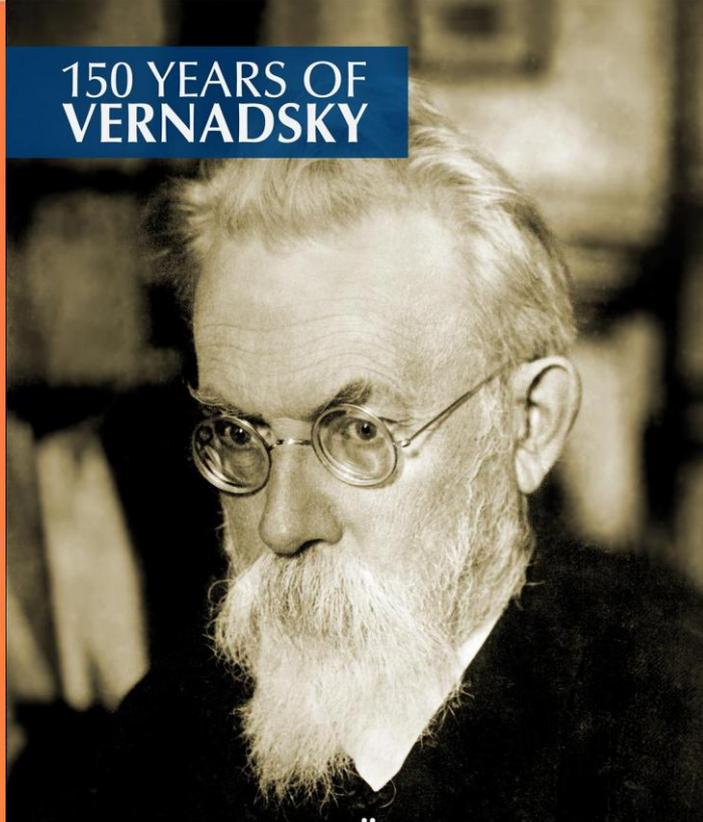


**Deforestation continues
to be a key issue**

Population explosion and concern for Earth's carrying capacity 1800s



150 YEARS OF
VERNADSKY



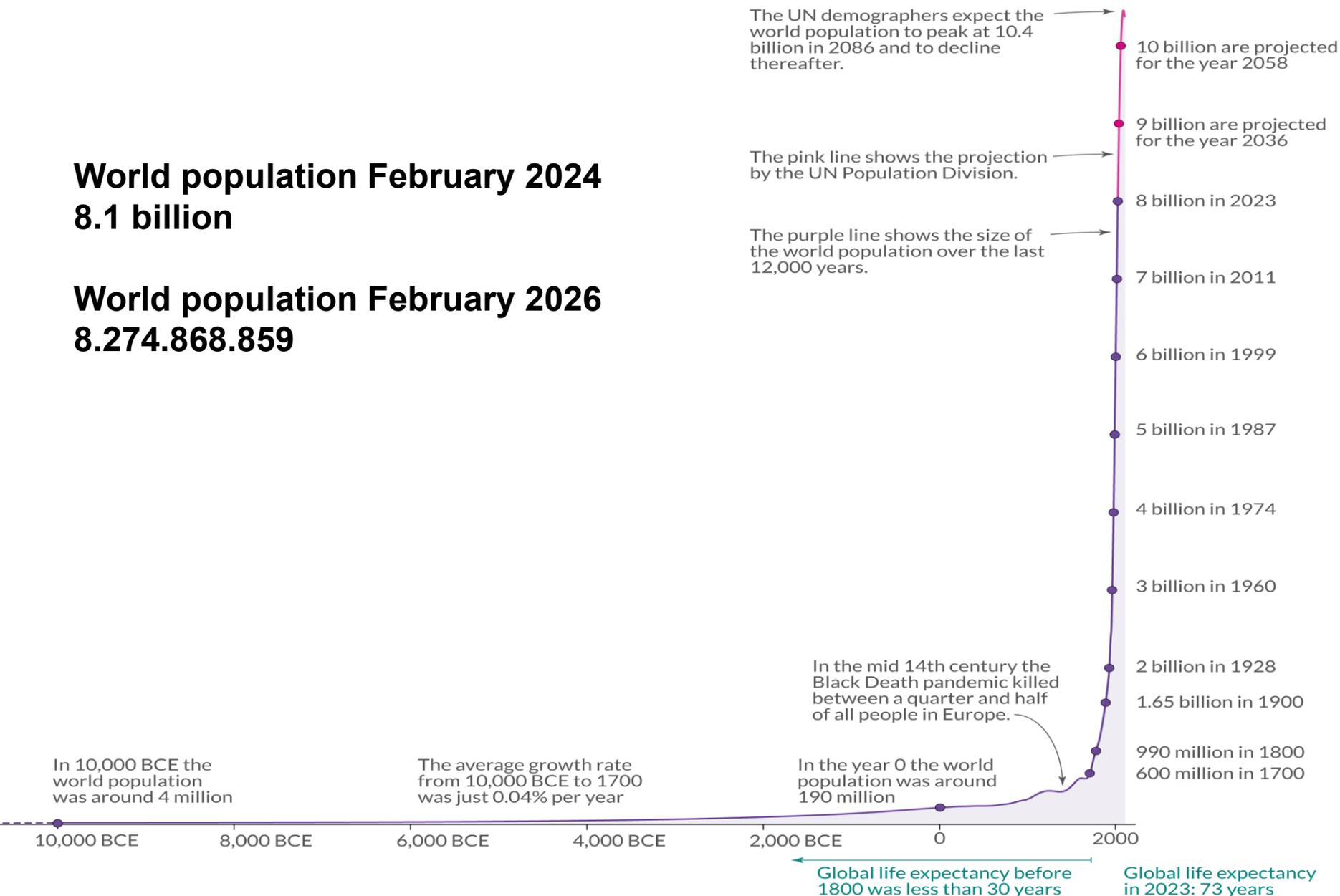
THE NOÖSPHERE VOLUME 2
21ST CENTURY SCIENCE & TECHNOLOGY · ANTHOLOGY



The size of the world population over the long-run

World population February 2024
8.1 billion

World population February 2026
8.274.868.859



Based on estimates by the History Database of the Global Environment (HYDE) and the United Nations.

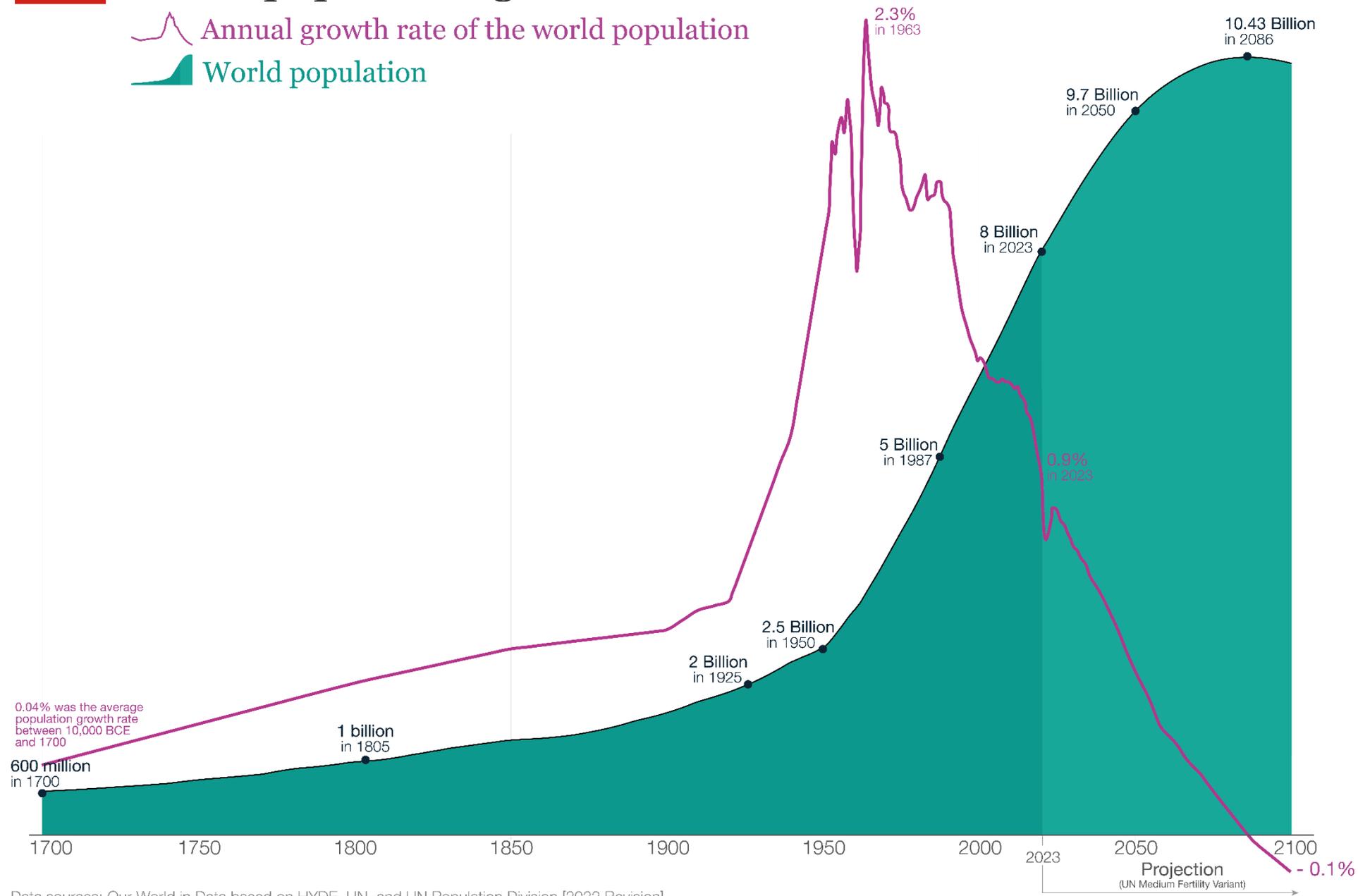
This is a visualization from OurWorldinData.org.

Licensed under [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) by the author Max Roser.

World population growth, 1700-2100

Annual growth rate of the world population

World population

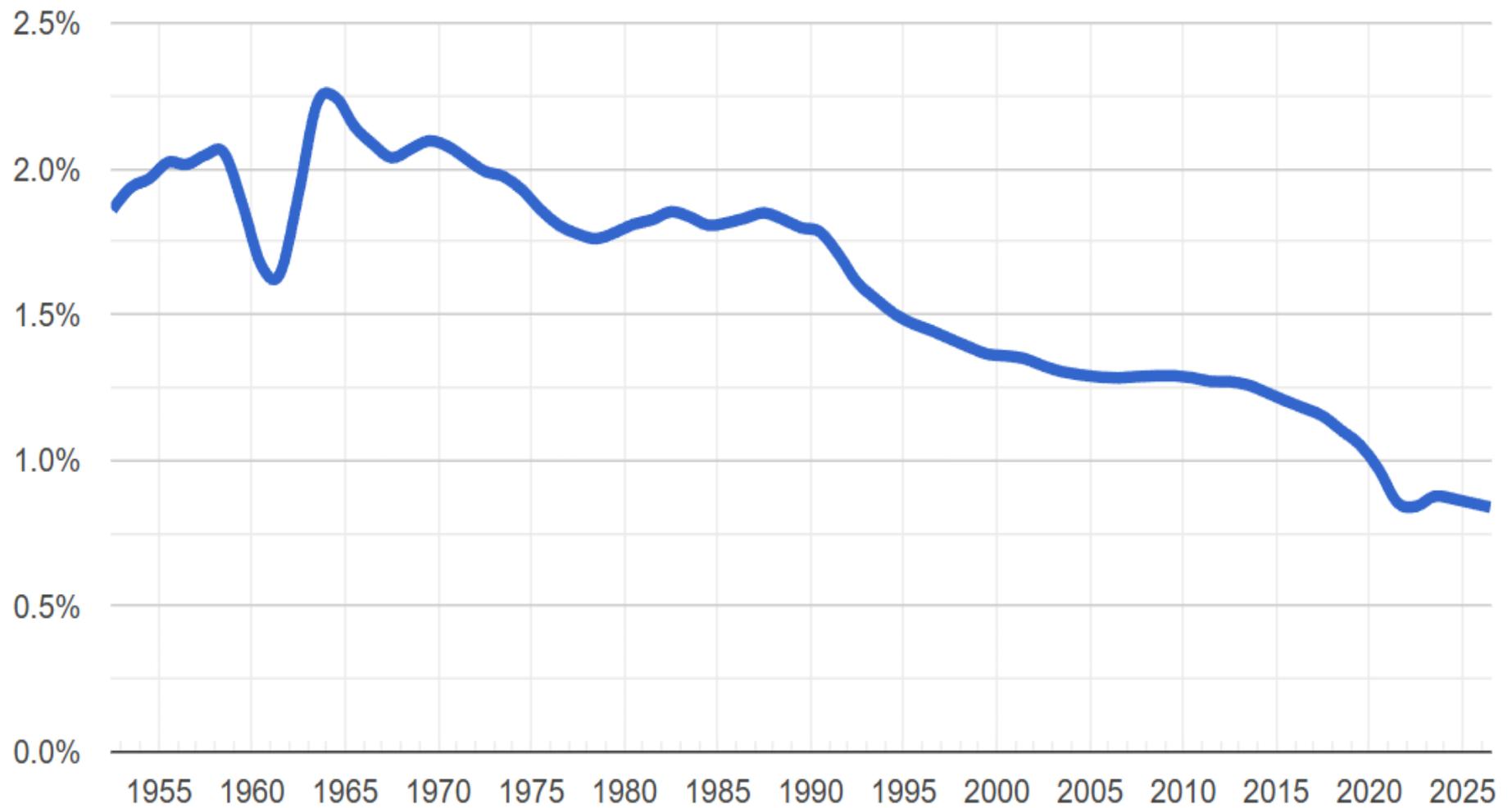


Data sources: Our World in Data based on HYDE, UN, and UN Population Division [2022 Revision]
This is a visualization from OurWorldinData.org, where you find data and research on how the world is changing.

Countries in the world by population (2024)

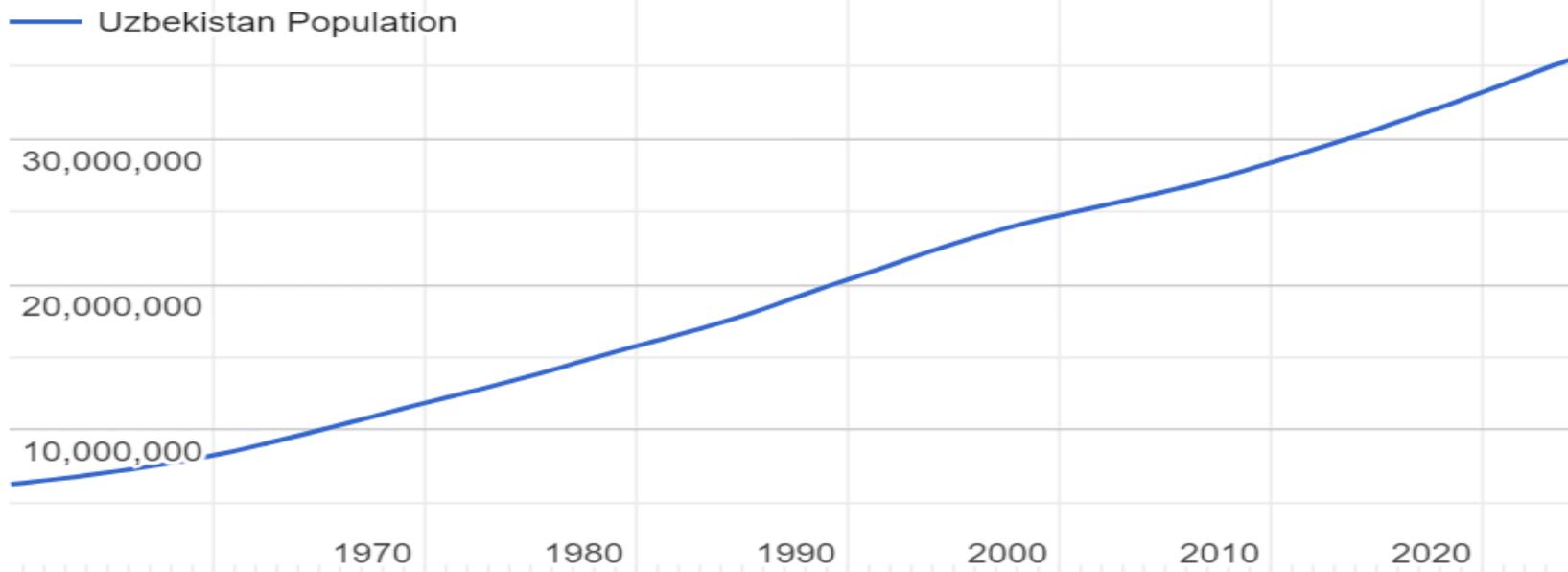
- Global population 8 billion ++
- By country <https://www.worldometers.info/world-population/population-by-country/>
- Most countries grow, but have small families
- Only Africa has large families ...
- Some countries have negative growth: Japan, Italy etc
- Global peak is expected around 2050

Yearly Growth Rate

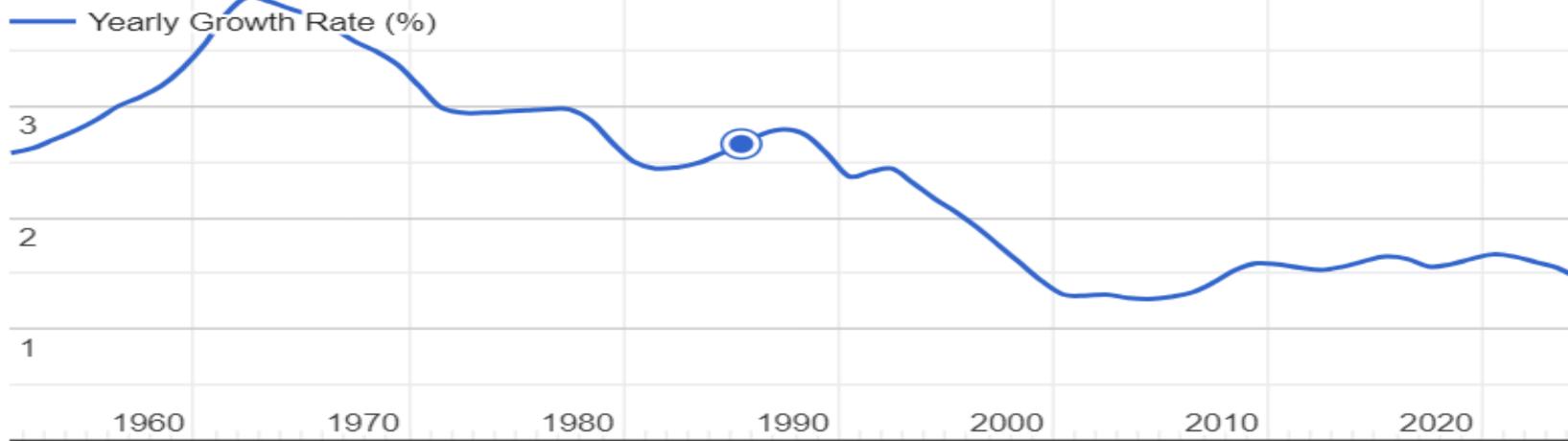


Source: https://www.worldometers.info/world-population/#google_vignette

Uzbekistan Population (1950 - 2024)



Yearly Population Growth Rate (%)



Nature protection movement 1900



**First Swedish National Park
in the north in 1909**

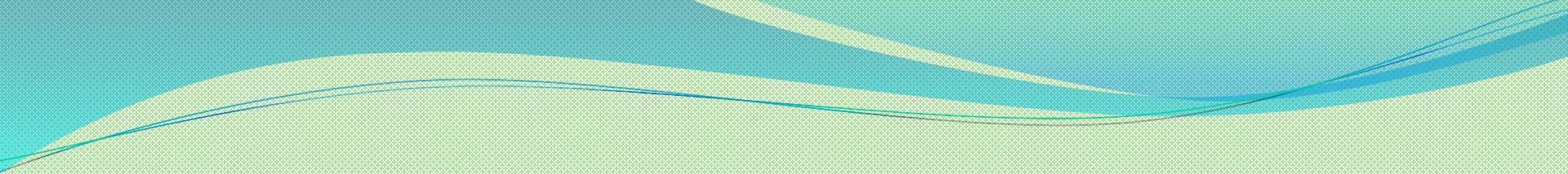
Yellowstone National Park from 1872



European Bison in Roumania



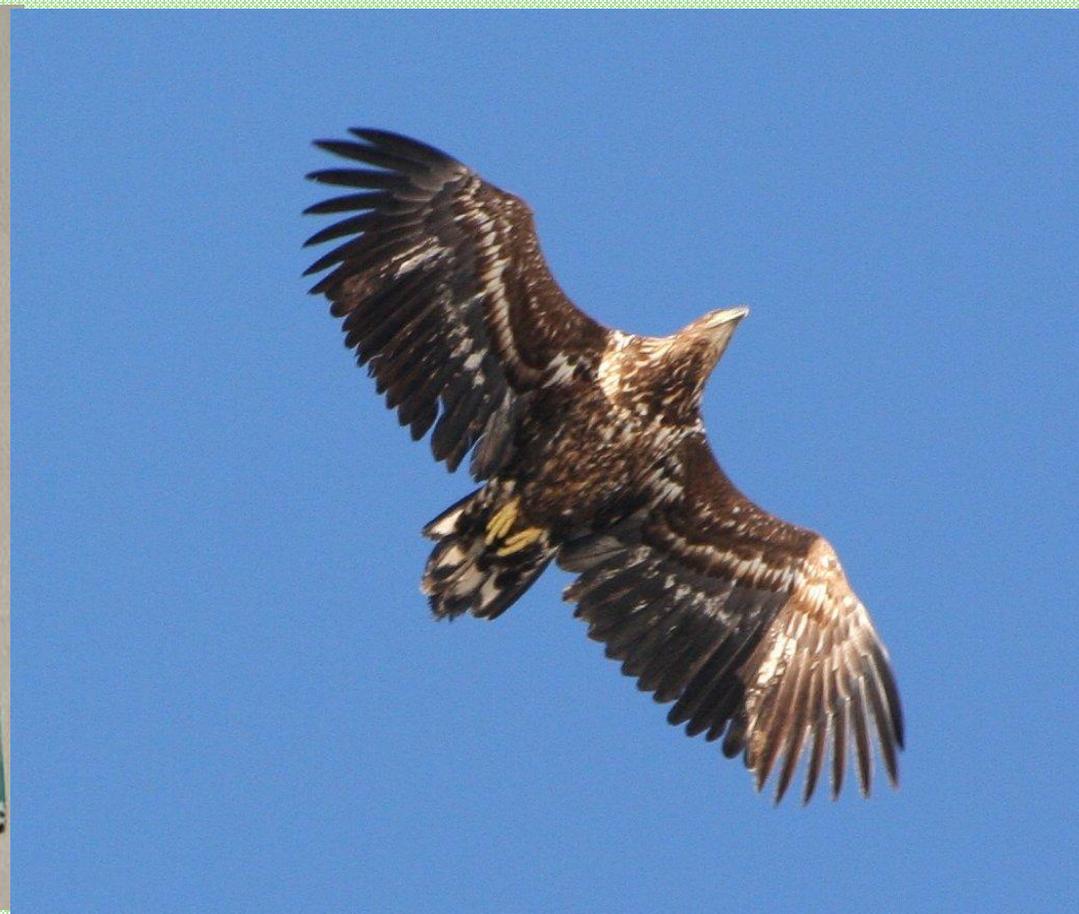
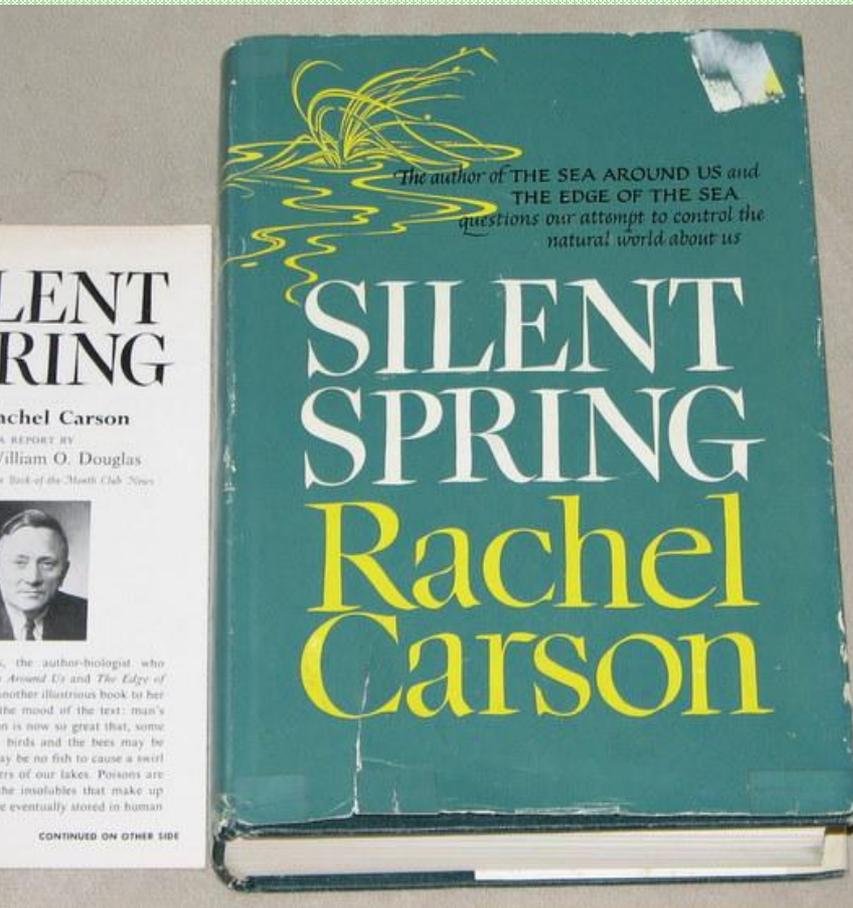
Rewilding Europe



**The modern
development begins in
the 1950s and 1960s**

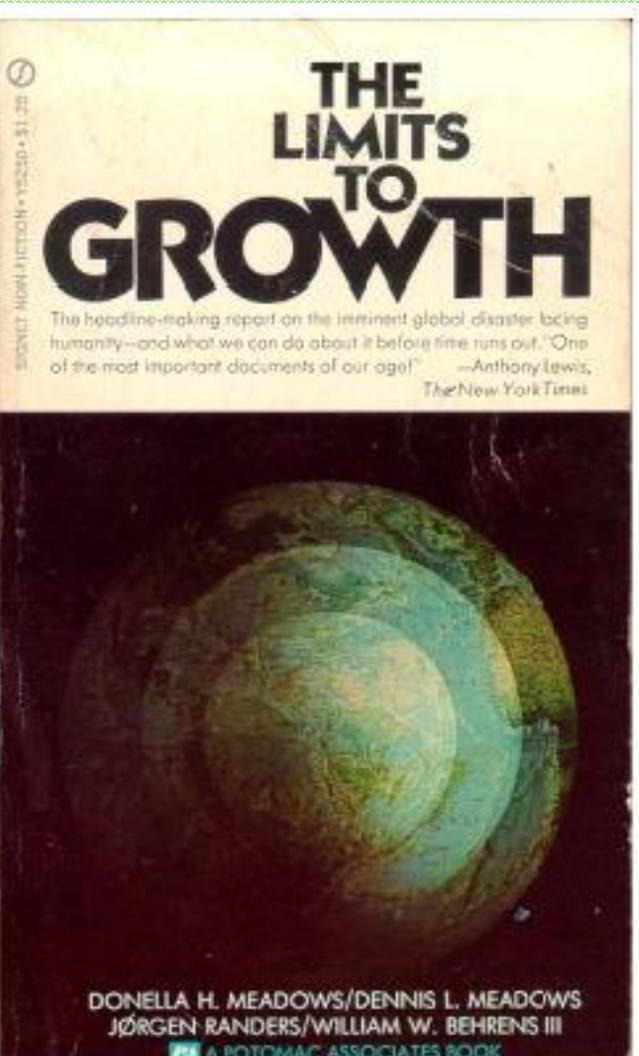
The environmental movement

Rachel Carson *Silent Spring* was published in 1962



Limits to Growth -

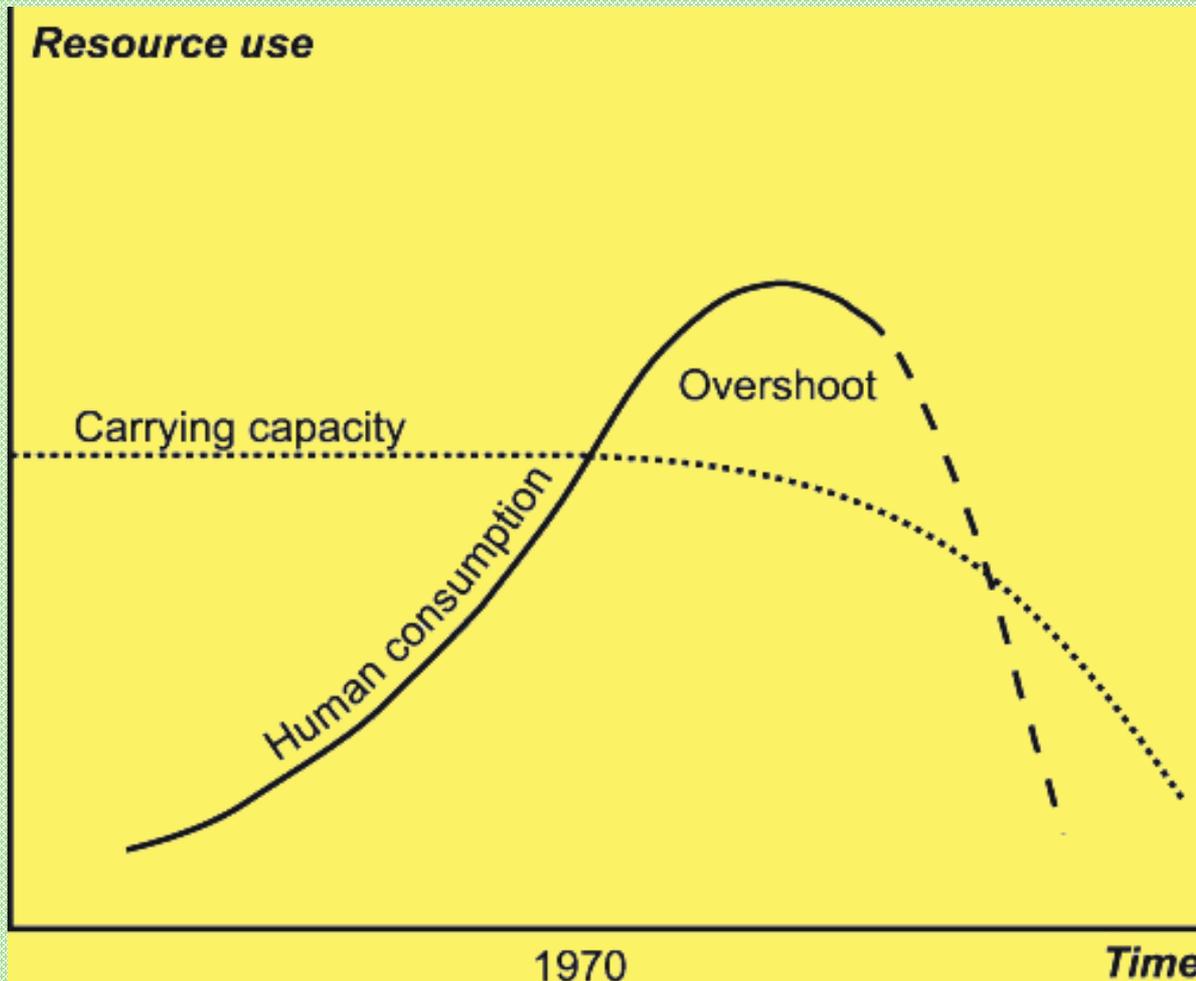
Club of Rome published “Limits to Growth” 1972



„We are searching for a model output that represents a world system that is 1. sustainable without sudden and uncontrollable collapse; and 2. capable of satisfying the basic material requirements of all of its people.“

Development!

From
Wackernagel and Reese
The ecological footprint



"Overshoot" depends
-Fossil fuels
-Overfishing
-Deforestation
-etc



1972 was a watershed-year

March, the **'Club of Rome' published 'Limits to growth'**. The state of the world was studied Using systems dynamics by Dennis and Donella Meadows and co-workers of the Massachusetts Institute of Technology (MIT). It said „We are searching for a model output that represents a world system that is: 1. sustainable without sudden and uncontrollable collapse; and 2. capable of satisfying the basic material requirements of all of its people.“

June, the first **UN-Conference on Environment took place in Stockholm**. Experts from around the world participated, scientists as well as politicians and grassroots activists. Environmental issues and the struggle against poverty in Third World countries were connected by terms like ‚eco-development‘ or ‚environmentally sound development‘.

December Apollo 17 flight to the moon. Astronaut Harrison H. Schmitt, took a breathtaking **photograph of the 'blue planet'**. For the first time mankind could take a look at the whole earth, in all its elegance, beauty and fragility. This snapshot, was to become the most published photograph in media-history. It made people all over the world recognize that they were citizens of one earth.

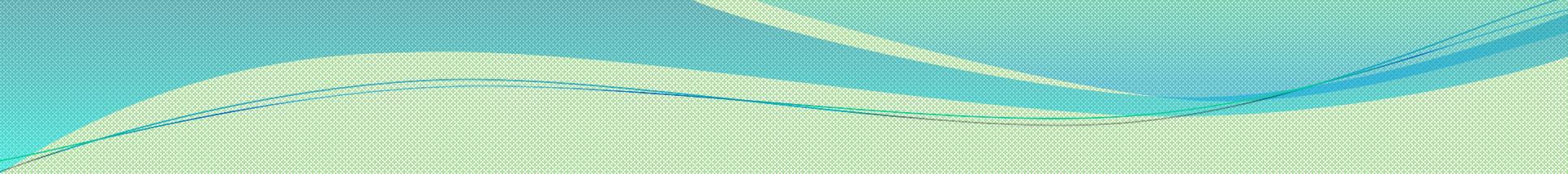
What is actually Sustainable Development?

- Is there a definition?
- Which are the conditions to achieve sustainable development?
- Which are the cases of collapse and successes?
- What can I do myself?

The meaning of “sustainable development” should be kept simple:

***sustainability* is a state which may continue in the long term, forever.**

***Sustainable development* is a development which brings us closer to sustainability.**



**Sustainable Development
is a systems study**



Aral Sea, 1957 coastal line in red

Cause: Diversion of rivers to irrigate cotton

Effect: A whole system of impacts

Nature

- Ecosystem collapse
- Loss of soil fertility

Society

- Population collapse
- Collapse of institutions

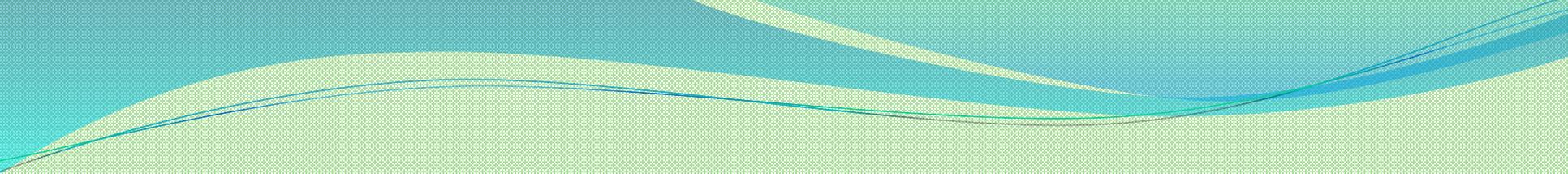
Economy

- Loss of fishery
- Loss of industries & agriculture

Health & Wellbeing

- Respiratory illness
- Depression and related problems





**Sustainable Development
is a statement of justice,
a new ethics**

The Brundtland Commission created the most often used “definition” of sustainable development:

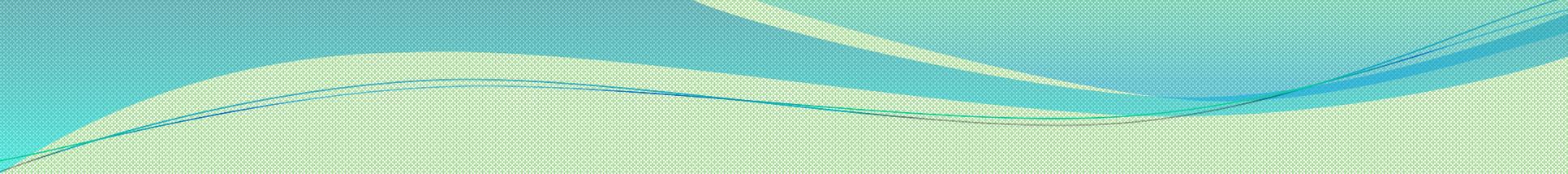
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

The concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given;

The idea of limitations of the environment's ability to meet present and future needs.

One may see the Brundtland report as a diplomatic compromise of the concern of the third world for development and the first world for environmental protection.

Intergenerational justice



**Certain conditions are needed
for
Sustainable Development**

Physical conditions for SD

Principle 1. Substances extracted from the lithosphere must **not systematically accumulate** in the ecosphere.

Principle 2. Human-made substances must **not systematically accumulate** in the ecosphere.

Principle 3. The physical conditions for **production and diversity** within the ecosphere must not systematically be deteriorated.

Principle 4. The use of resources must be **efficient and just** with respect to meeting human needs.

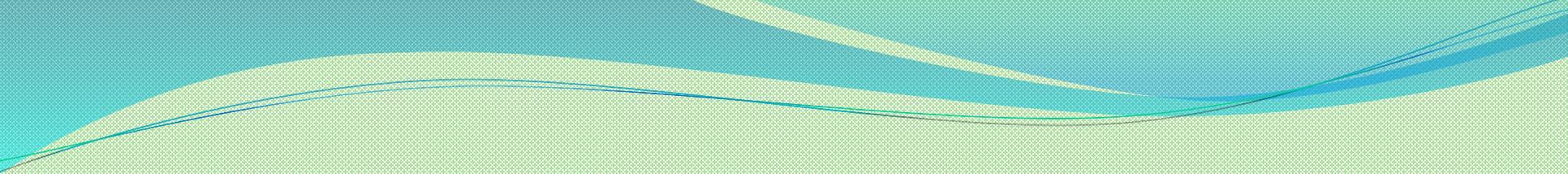
These conditions are used by the Natural Step Foundation

Biological conditions for SD

1. For sustainability, ecosystems dispose of wastes and replenish nutrients by **recycling** all elements.
2. For sustainability, ecosystems use **sunlight** as their source of energy.
3. For sustainability, the **size of consumer populations** are maintained so that overgrazing or over-use does not occur.
4. For sustainability, **biodiversity** is maintained.

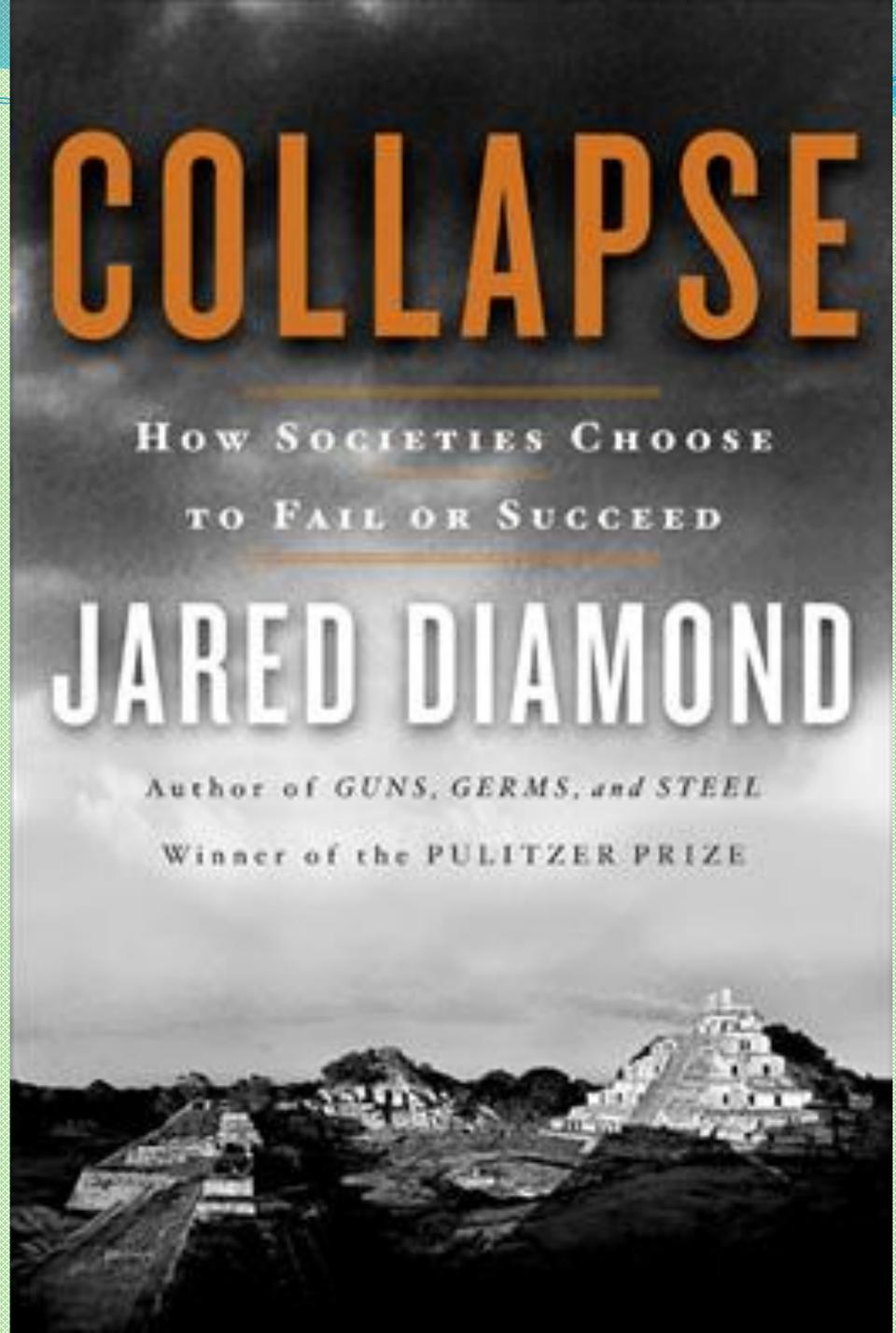
Social conditions for SD?

1. For sustainability the population of a society (country) can not grow without limits. **Ageing society.**
2. For sustainability the resources of a society (country) should be shared equally. **Intra-generational justice.**
3. For sustainability, consumption in a society needs to be limited and **welfare based on non-material values.**
4. For sustainability economic growth can not go on without limits. **Non-growth economy.**



**Sustainable Development may
be studied as an empirical
question**

Societies collapse because they did not preserve and manage properly their ecosystems. Forests were cut down and land animals and fisheries overused.

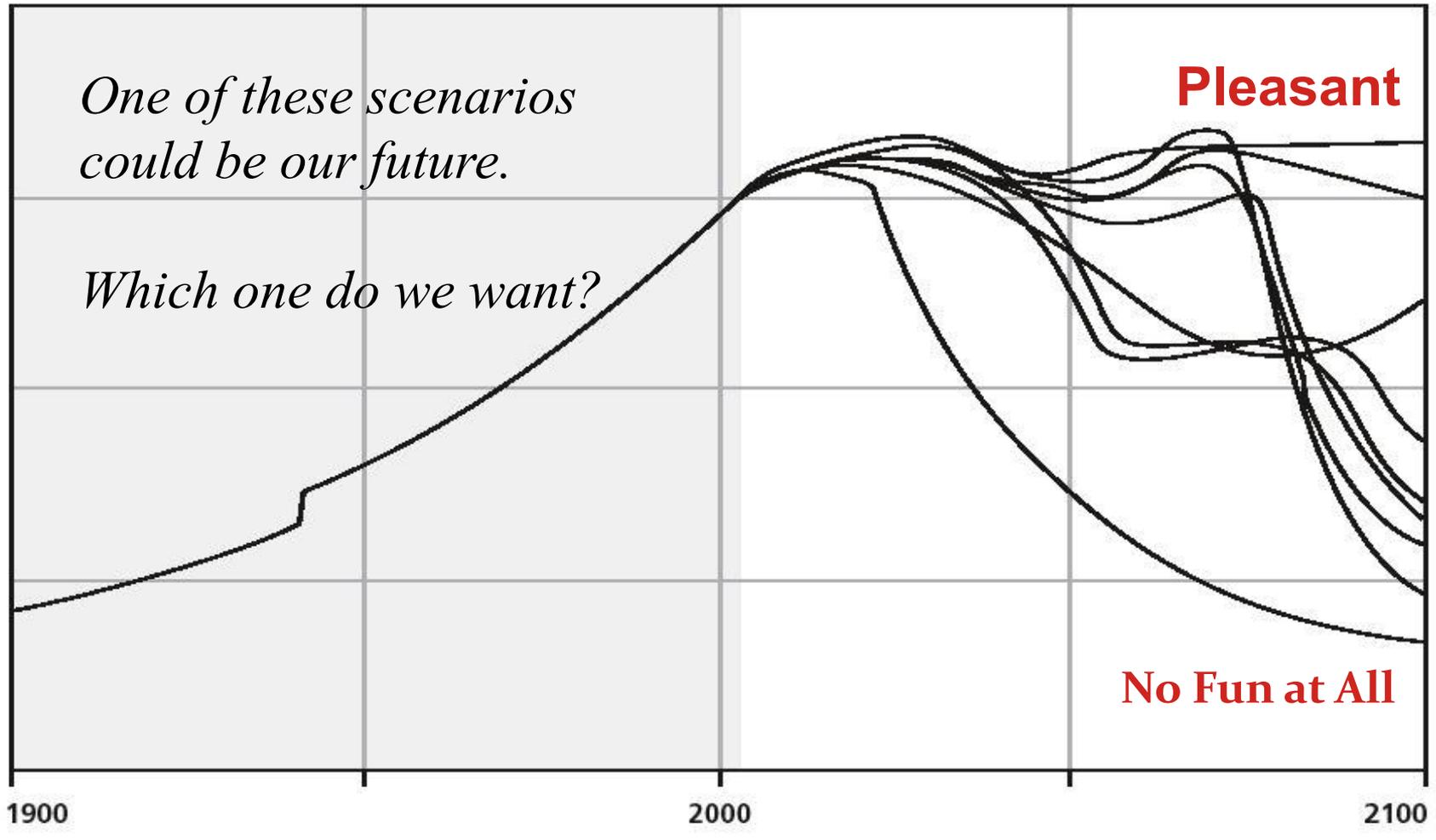


Why did people make disastrous decisions?

1. The problem was not understood, anticipated, recognized
2. “Creeping normality” and denial
3. Conflict of (economic) interest, especially between those far away and those close to the site.
4. Survival from day to day
5. Tragedy of the commons or selfishness or lack of society control
6. Value questions, especially religious values

Possible Futures

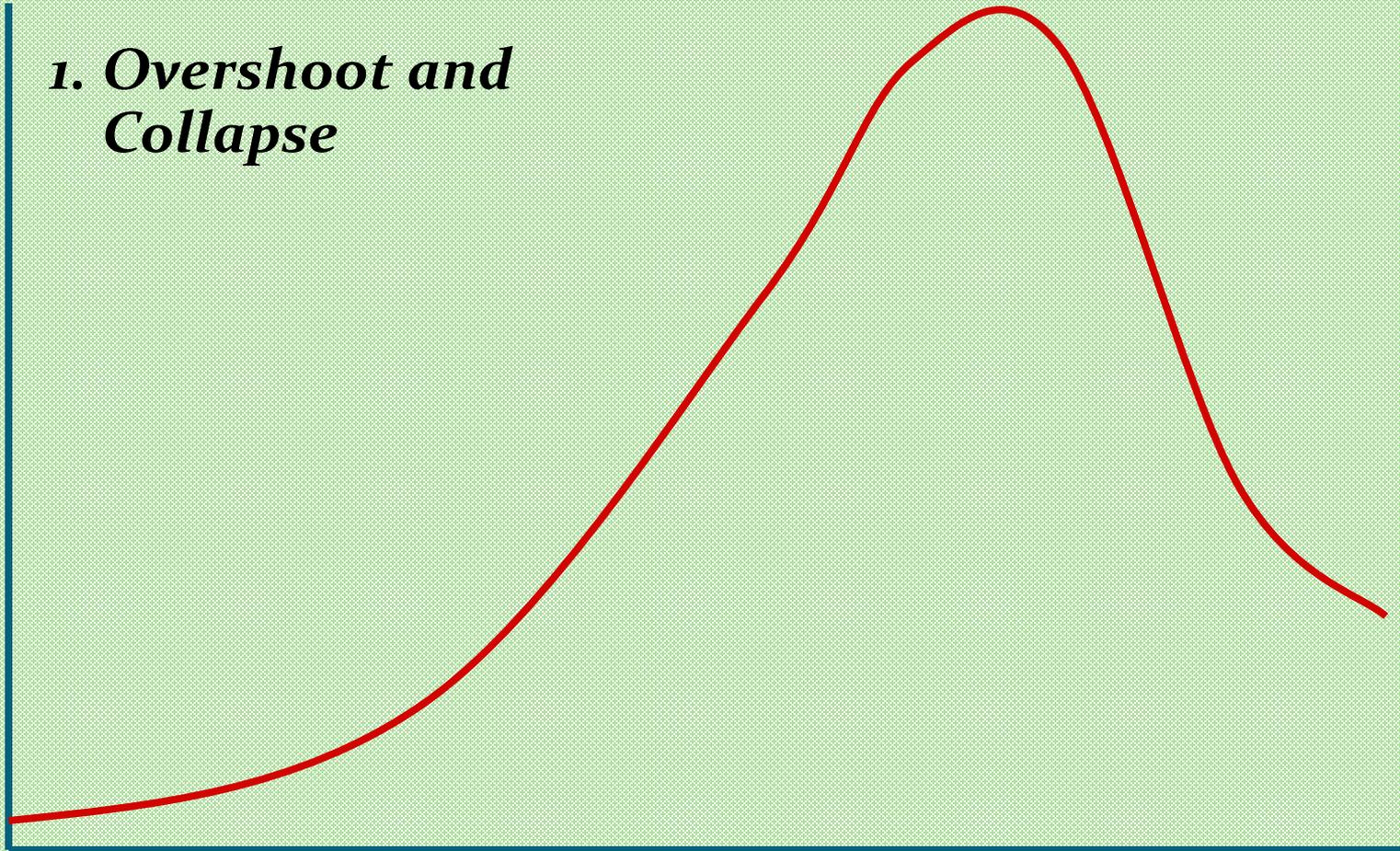
Human Welfare



Source: "Limits to Growth—the 30-Year Update" (citing other international data sources), Chelsea Green Publishing, USA, 2004

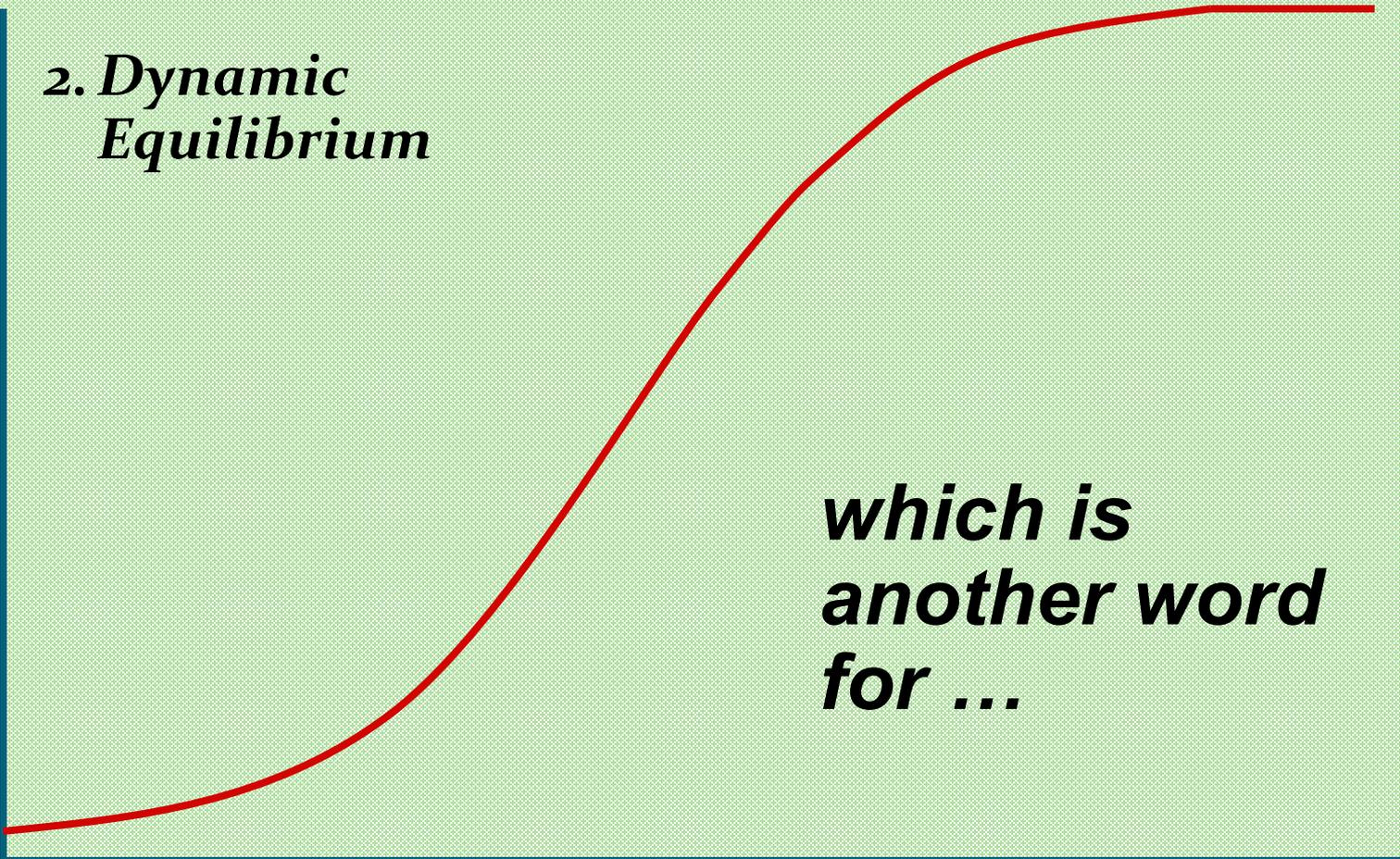
Exponential Growth Against Firm Limits Has Just Two Possible Outcomes

1. Overshoot and Collapse



Exponential Growth Against Firm Limits Has Just Two Possible Outcomes

2. *Dynamic
Equilibrium*



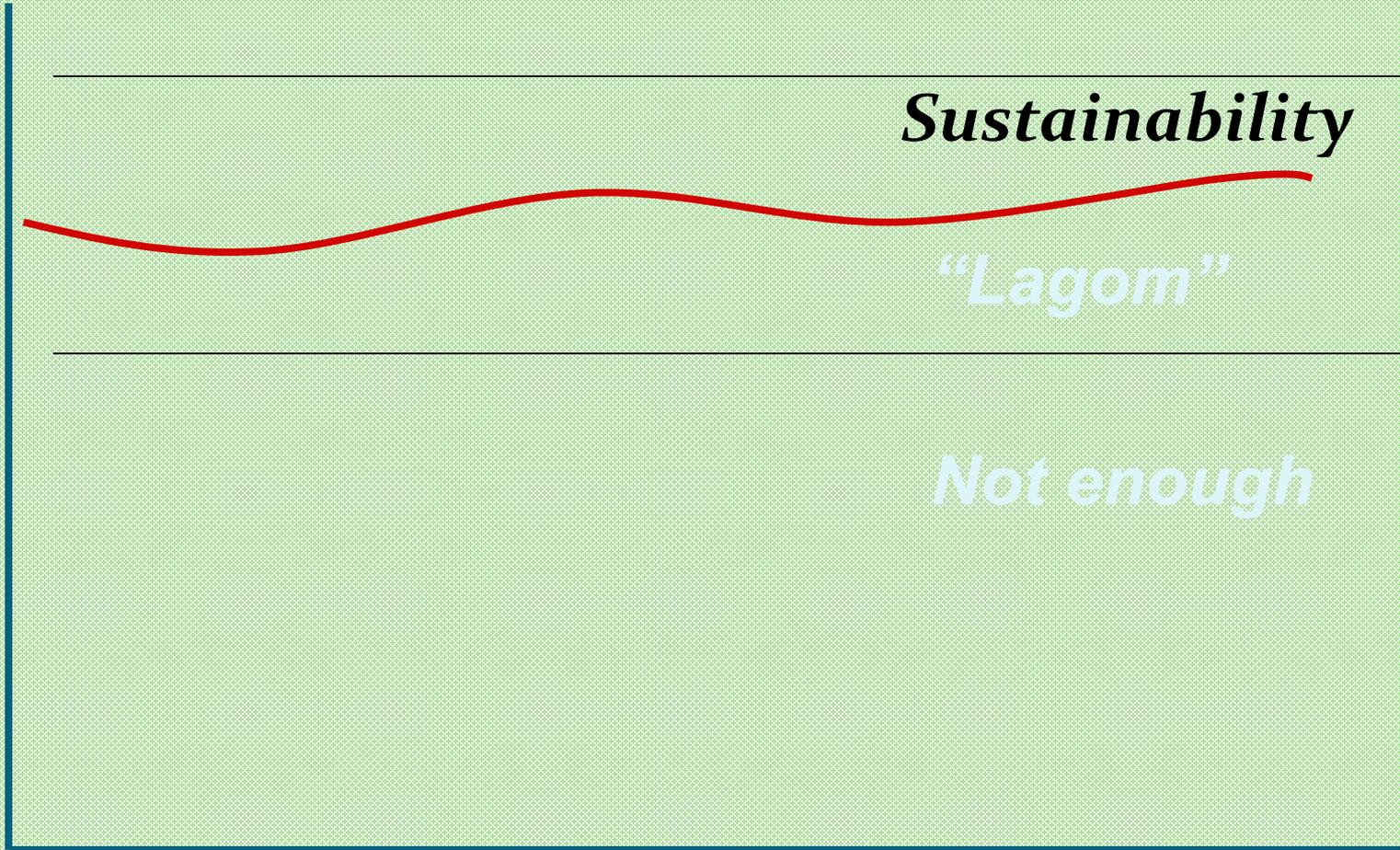
*which is
another word
for ...*

Too much

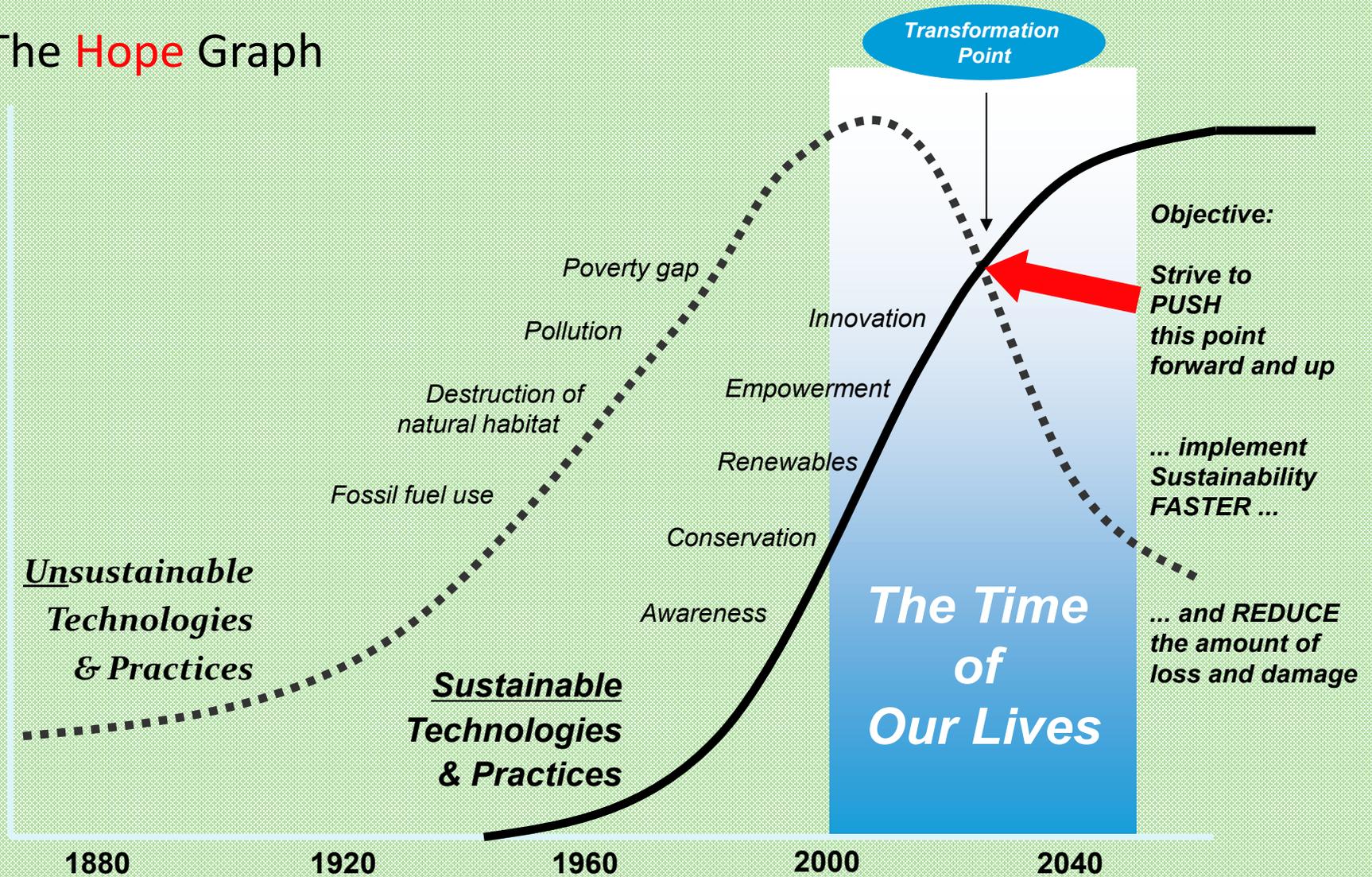
Sustainability

“Lagom”

Not enough



The Hope Graph



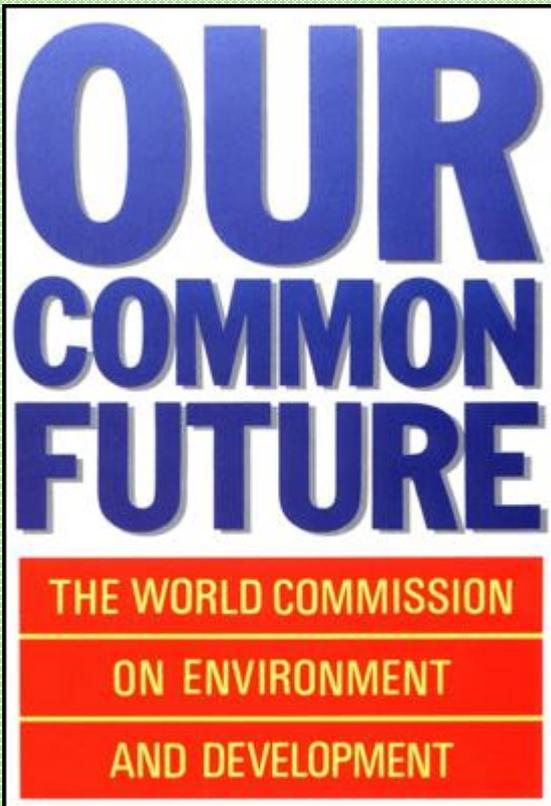
30 minutes

During 10 minutes discuss and formulate comments and questions.

After 10 minutes every student should be prepared with one comment or question.

The UN Process

World Commission on Environment and Development “Brundtland Commission”



The report
Our Common Future
was published in 1987

United Nations Conference on Environment and Development (UNCED) Rio de Janeiro, 3-14 June 1992

Earth
Summit

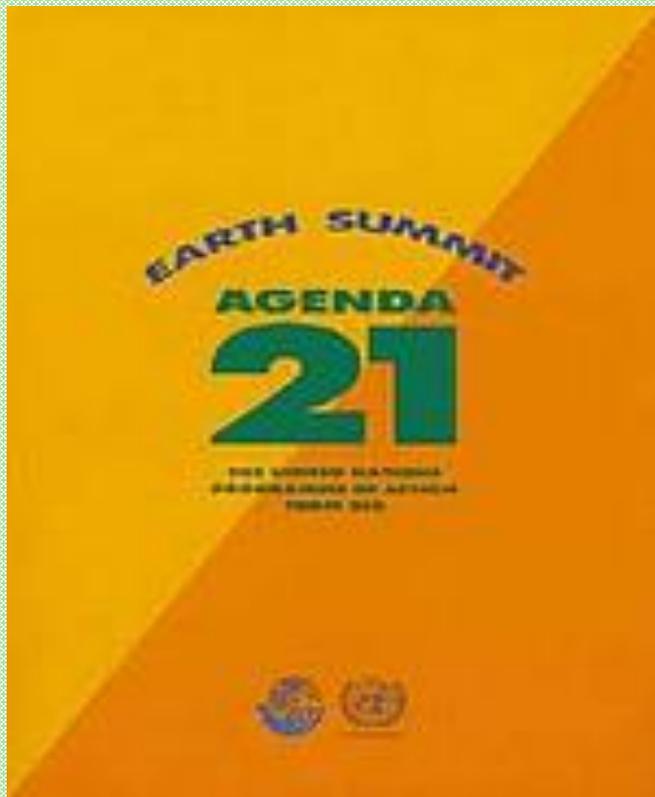


UNCED conference in Rio de Janeiro in 1992

- In 1992 the UNCED conference established Sustainable Development on the International agenda.
- UNCED produced the Agenda 21, the Rio Declaration and the three Rio conventions.
- The CSD, Commission for Sustainable Development, at the UN headquarter in New York, was established.

The UNCED meeting in Rio de Janeiro in 1992

The basic document is the Agenda 21



The Global conventions

Global conventions are agreements between governments on specific topics. The Rio conventions were created in connection with the Rio conference:

- The Framework Convention on Climate Change UNFCCC
- The Convention on Biological Diversity, CBD
- The Convention to Combat Desertification, UNCCD.

The conventions all have their Conferences of the Parties (COPs) mostly each year.

The UN system relies on consensus

The UN system mostly relies on **consensus**, but the present 193 member states very seldom agree completely.

Protocols have binding obligations of the parties. There are only few protocols with legal structure with agreements, monitoring, reporting and sanctions for states, which break a decided agreement.

The Global Agendas

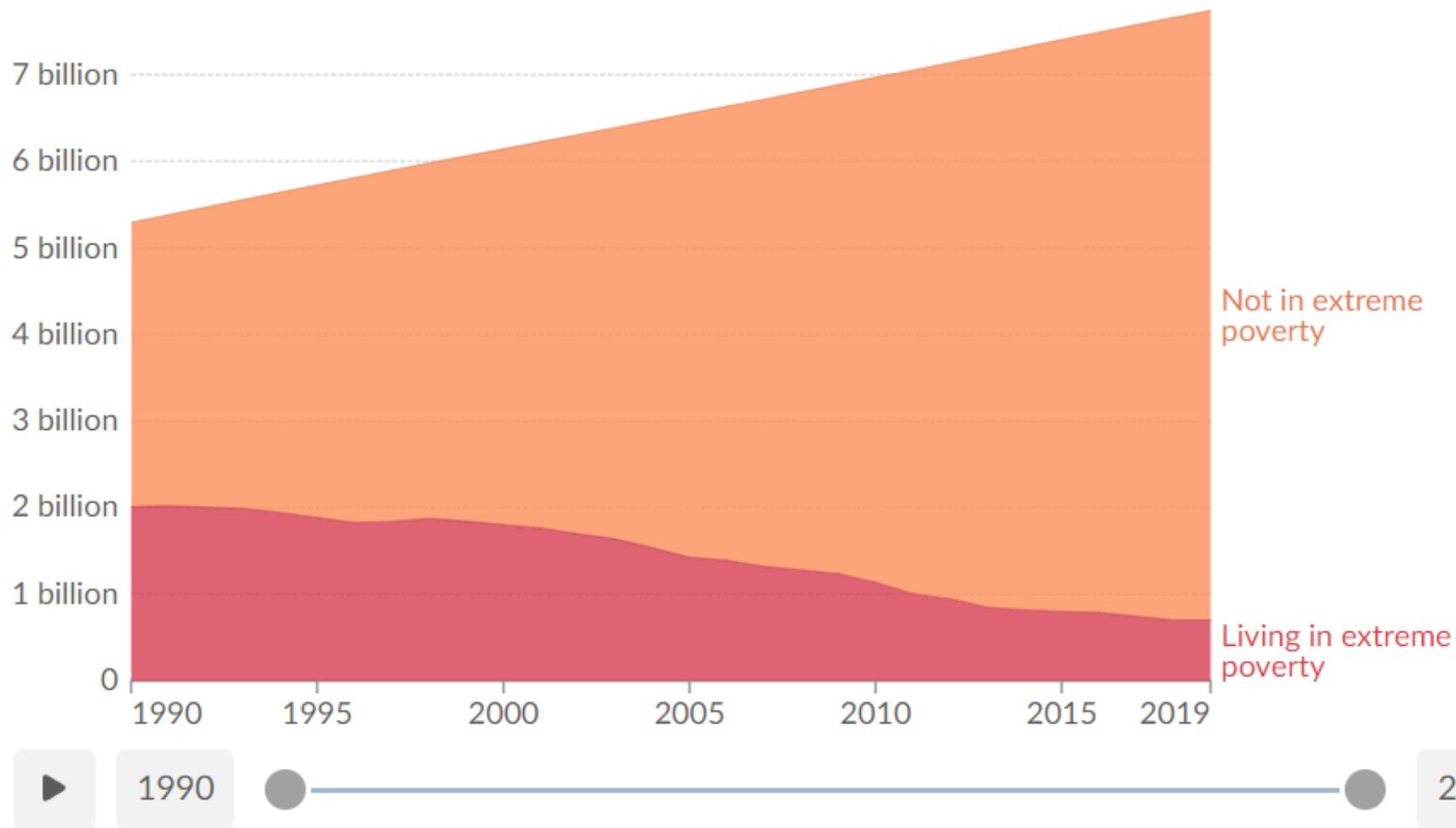
A global agenda is a plan for what to do. It is taking shape in spite of the lack of a global government.

- **Agenda 21** was the first such concrete Agenda.
- **Millennium Development Goals**, MDGs, were decided by the UN General Assembly in its 2000 meeting for 2015.
- The Sustainable Development Goals, SDGs, introduced in 2015 constitute the new global **2030 Agenda**.

Millennium Development Goals

The MDGs were quantified

- Goal 1:** Eradicate extreme poverty and hunger
- Goal 2:** Achieve universal primary education
- Goal 3:** Promote gender equity and empower women
- Goal 4:** Reduce child mortality
- Goal 5:** Improve maternal health
- Goal 6:** Combat HIV/AIDS, malaria and other diseases
- Goal 7:** Ensure environmental sustainability
- Goal 8:** Develop a global partnership for development



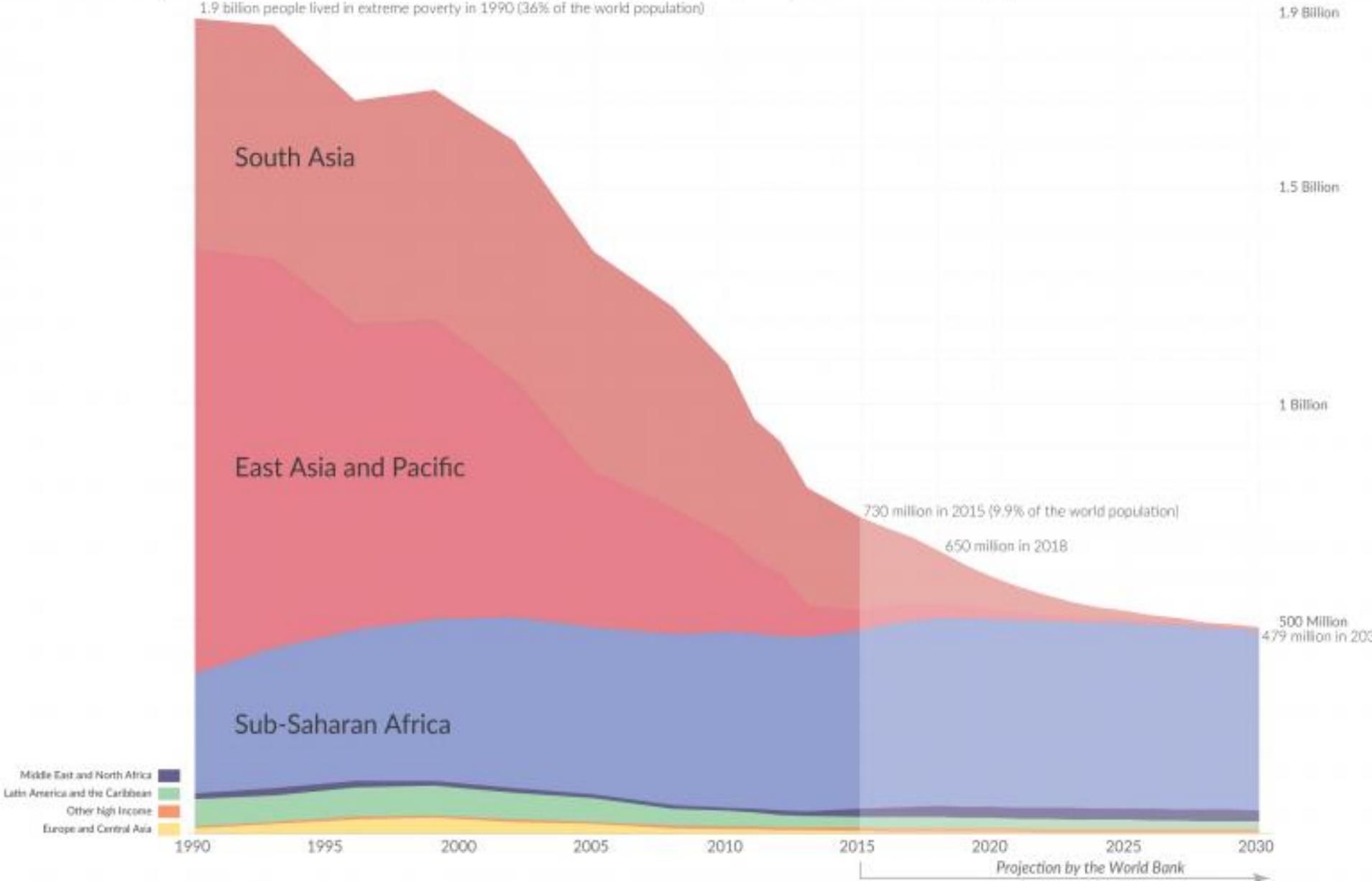
Data source: World Bank Poverty and Inequality Platform (2023) – [Learn more about this data](#)

Note: This data is expressed in international-\$ at 2017 prices. Depending on the country and year, it relates to income measured after taxes and benefits, or to consumption, per capita.

The number of people in extreme poverty – including projections to 2030

Extreme poverty is defined by the 'international poverty line' as living on less than \$1.90/day. This is measured by adjusting for price changes over time and for price differences between countries (PPP adjustment). From 2015 to 2030 the World Bank's projections are shown.

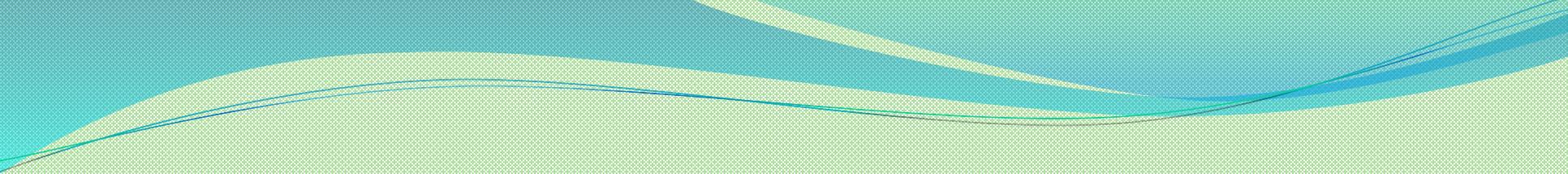
1.9 billion people lived in extreme poverty in 1990 (36% of the world population)



Data source: World Bank data from 1990 to 2015. The projections from 2015 to 2030 are published in the World Bank report *Poverty and Shared Prosperity 2018*.

This is a visualization from OurWorldinData.org, where you find data and research on how the world is changing.

Licensed under CC-BY by the author Max Rose



**Sustainable
Development Goals
2015-2030**

Transforming Our World

The 2030 Agenda for Sustainable Development

- Open Working Group delivered the report in October 2014 after 2 years of work. Adopted by UN General Assembly in September 2015.
- 17 goals were agreed - emphasis on the social dimension. The goals are all quantifiable and will be reported. There are 169 targets, and even more indicators.
- They will set the global agenda to 2030.

1 NO
POVERTY



2 ZERO
HUNGER



3 GOOD HEALTH
AND WELL-BEING



4 QUALITY
EDUCATION



5 GENDER
EQUALITY



6 CLEAN WATER
AND SANITATION



7 AFFORDABLE AND
CLEAN ENERGY



8 DECENT WORK AND
ECONOMIC GROWTH



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



10 REDUCED
INEQUALITIES



11 SUSTAINABLE CITIES
AND COMMUNITIES



12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



13 CLIMATE
ACTION



14 LIFE
BELOW WATER



15 LIFE
ON LAND



16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS



17 PARTNERSHIPS
FOR THE GOALS



**SUSTAINABLE
DEVELOPMENT
GOALS**



The SDGs are all connected to each other

It is widely recognized that achieving these Goals involves making very big, fundamental changes in how we live on Earth. This is

Transition



2023

The Sustainable Development Goals Report

Special edition



<https://unstats.un.org/sdgs/report/2023/>

Webpage for the course

<https://www.aralsjon.nu/en/2026/01/lectures-and-presentations-2026/>

<https://www.aralsjon.nu/en/2026/01/schedule-sdss-course-2026/>

<https://karsu.uz/>

You will find the ppt of the lectures and recorded lectures as well as reference to reading tasks.

To read

Lecture 1. Historical background and concepts

- Building Sustainable Societies. Chapter 1 *Building Sustainable Societies – the Human Dimension* pp 9-23.
- Building Sustainable Societies. Chapter 2 *One Planet Life* pp 24- 37.

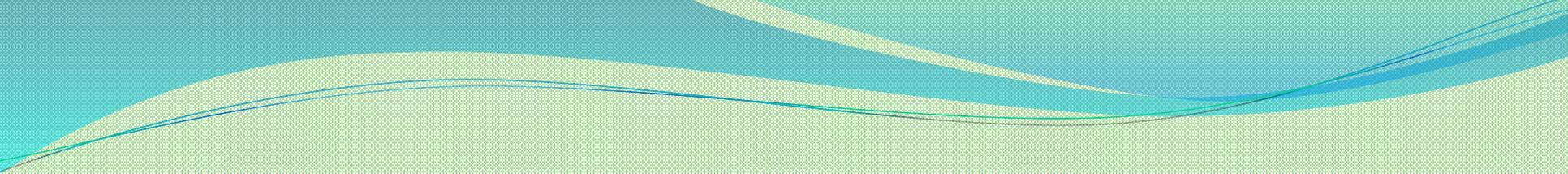
<https://www.aralsjon.nu/download/building-sustainable-societies/?tmstv=1770911102>

Student seminars

- Every student in the course will give two small presentations, and comment on two presentations.
- This will happen in seminars conducted one hour after the lectures, 17 hrs Uzbek time, from lecture 2 to 14;
- 3 presentations for each seminar, i.e. a total of some 40 presentations with comments.

Presentations

- Presentation should be about 5 minutes and comments not more.
- Presentations and comments in English
- Some slides (in English)
- Topic related to sustainable development; consult with your local teacher.
- Be careful with your preparation and slides!
- Read instructions for the seminars



**Thank you for today
&
Good Luck**