



Systematic Approach to Environmental Health

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“We cannot command Nature, except by obeying her.”



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Learning objectives....

At the end of this lecture, students are expected to :

- ❖ **Define** Environment and related health terms..
- ❖ **Conceicve** the mutual relationships between environmental conditions and ill health, disease burden
- ❖ **Describe** the major environmental health problems
- ❖ **Develop** a professional responsibility & understanding as a physician on the global **environmental health challenge** and resolution alternatives
- ❖ **Construct** a **systematic approach** to environmental health issues and recognize major institutions both national and internatinal scales such as **UNEP, COP-28** etc.
- ❖ **Realise** the role of environmental health within the integrity of **ONE HEALTH - ONE MEDICINE** as a WHO motto.

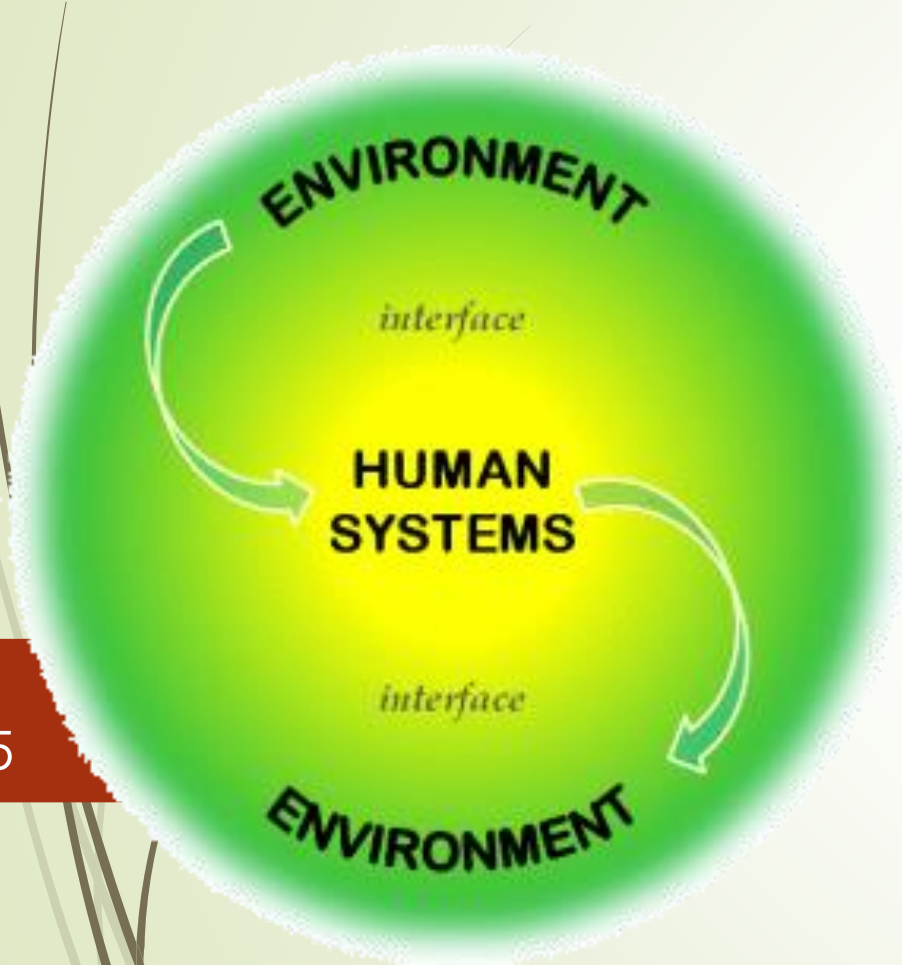


What is environment?

- ❑ **Environment** can be defined as an *aggregate of all the external conditions* influencing and affecting the life and development of an organism.
- ❑ *Also it is defined to include all that is external to the human body.*



Environmental Health



- **Environmental health** is concerned with assessing, controlling, and improving the impact people make on their environment and the impact of the environment on them, mutually.
- The field of **environmental health** is concerned with all those elements of the environment that influence people's health and well-being.
- The conditions of workplaces, homes, or communities, including the many forces -chemical, physical, and psychological- present in the environment that **affect human health**, are important considerations.

WHO's Definition of Environmental Health

Environmental health comprises those aspects of human health, including **quality of life**, that are determined by **physical, biological, social, and psychosocial factors** in the environment.

It also refers to the theory and practice of **assessing, correcting, controlling, and preventing** those factors in the environment that can potentially **affect adversely** the health of present and future generations.



http://www.seuro.who.int/topics/environmental_health/en/

What is Environmental Public Health?

- ➔ **“Public health”** is another term that is frequently misunderstood. Recent research has confirmed that many people think it refers to government health programs. But **public health** is really about protecting populations -tribes, communities, cities, states, and nations- from threats to their health, safety, and well-being.
- ➔ **Therefore, environmental public health** focuses on protecting groups of people from threats to their health and safety posed by their environments. We at the **National Center for Environmental Health** (NCEH) and the Agency for Toxic Substances and Disease Registry (ATSDR) focus on protecting **public health** in the environments in which we live, work, study, and play.
- ➔ **Protecting people from environmental health threats** requires an understanding of basic human needs and how the environment can affect them.

What is Environmental Public Health?

- ▶ **April 22** marks the 53rd anniversary of Earth Day in the United States and the 23rd anniversary world-wide. **Earth Day** reminds us of our personal and collective responsibility to preserve and protect our environment. And protecting *our environment* also helps us protect our health.
- ▶ Every year on **April 22, Earth Day** marks the anniversary of the birth of the modern environmental movement in 1970.
- ▶ *For many, the word “environment” relates to the natural world mountains, forests, rivers, oceans, animals, and the air around us.*
- ▶ To others, the environment brings to mind “tree huggers,” **the green movement**, or the motto “**Reduce, Reuse, Recycle.**” (**3 Rs!**)
But the environment is really everything in the world surrounding us.
When environments become polluted or contaminated, they can cause harmful health effects in human beings.

4 Major categories of environmental system..

1. Psycho-social environment
2. *Cultural environment*
3. Work place environment
4. *Biological environment*



Some definitions...

Exposure :

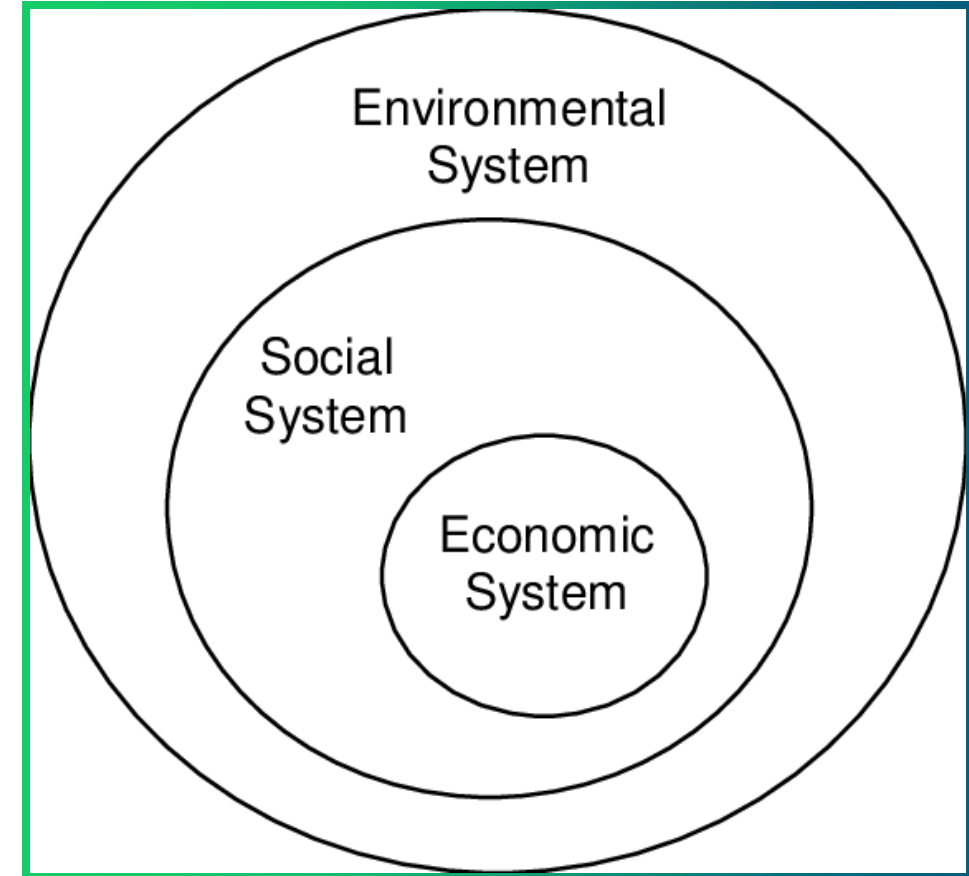
- Any condition which provides an opportunity for an external environmental agent to enter the body

Agent :

- *Any chemical, biological, or physical material capable of eliciting a biological response*
- *Different than the vector carrier (air, soil, water, food)*

Dose :

- The amount of agent actually deposited within the body
- Typically, the distinction between exposure and dose is blurred, although in reality, significantly different doses can result from the same exposure



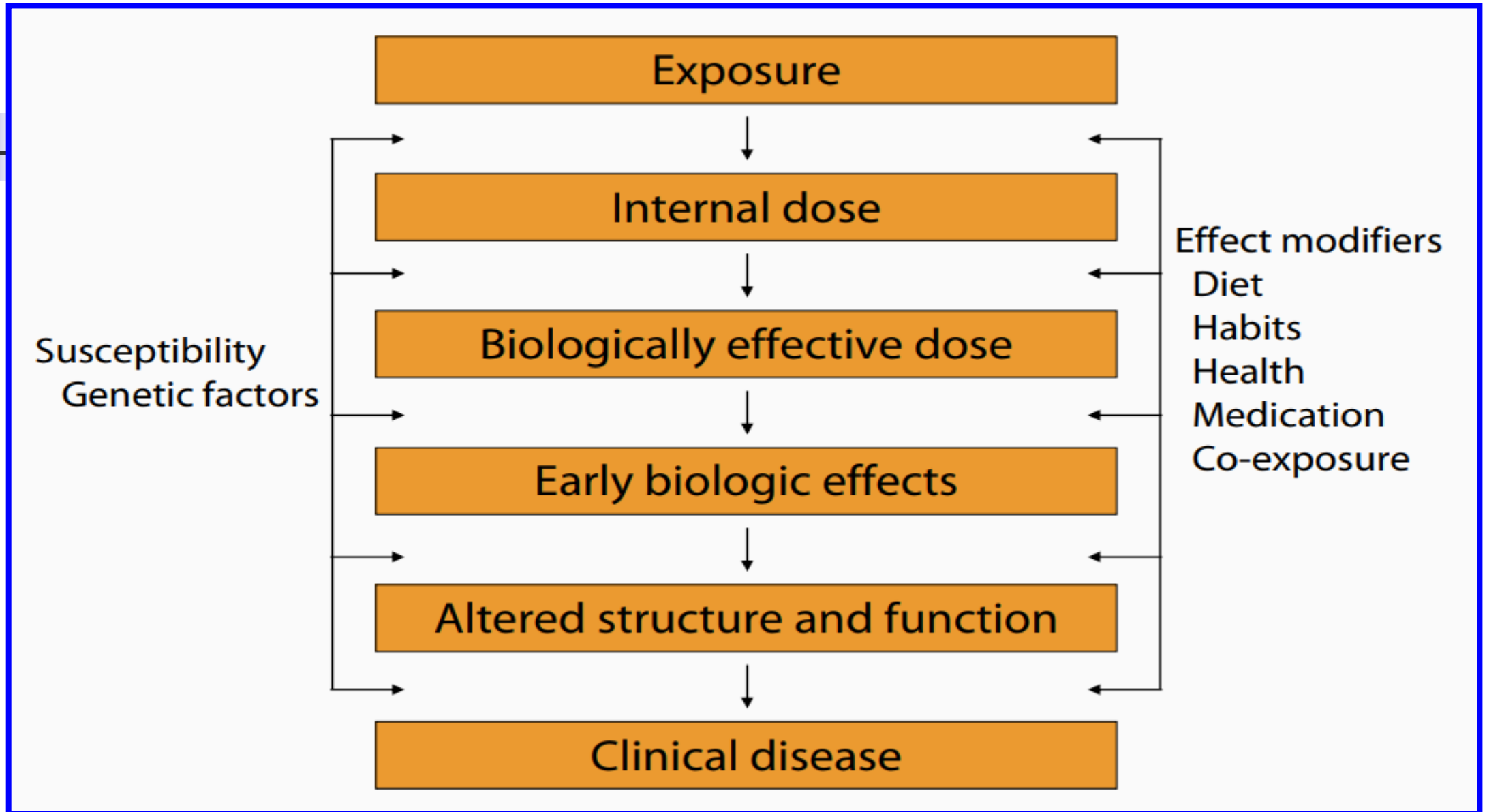
Distinction between exposure and dose

Exposure is “outside” the body

Dose is “inside” the body

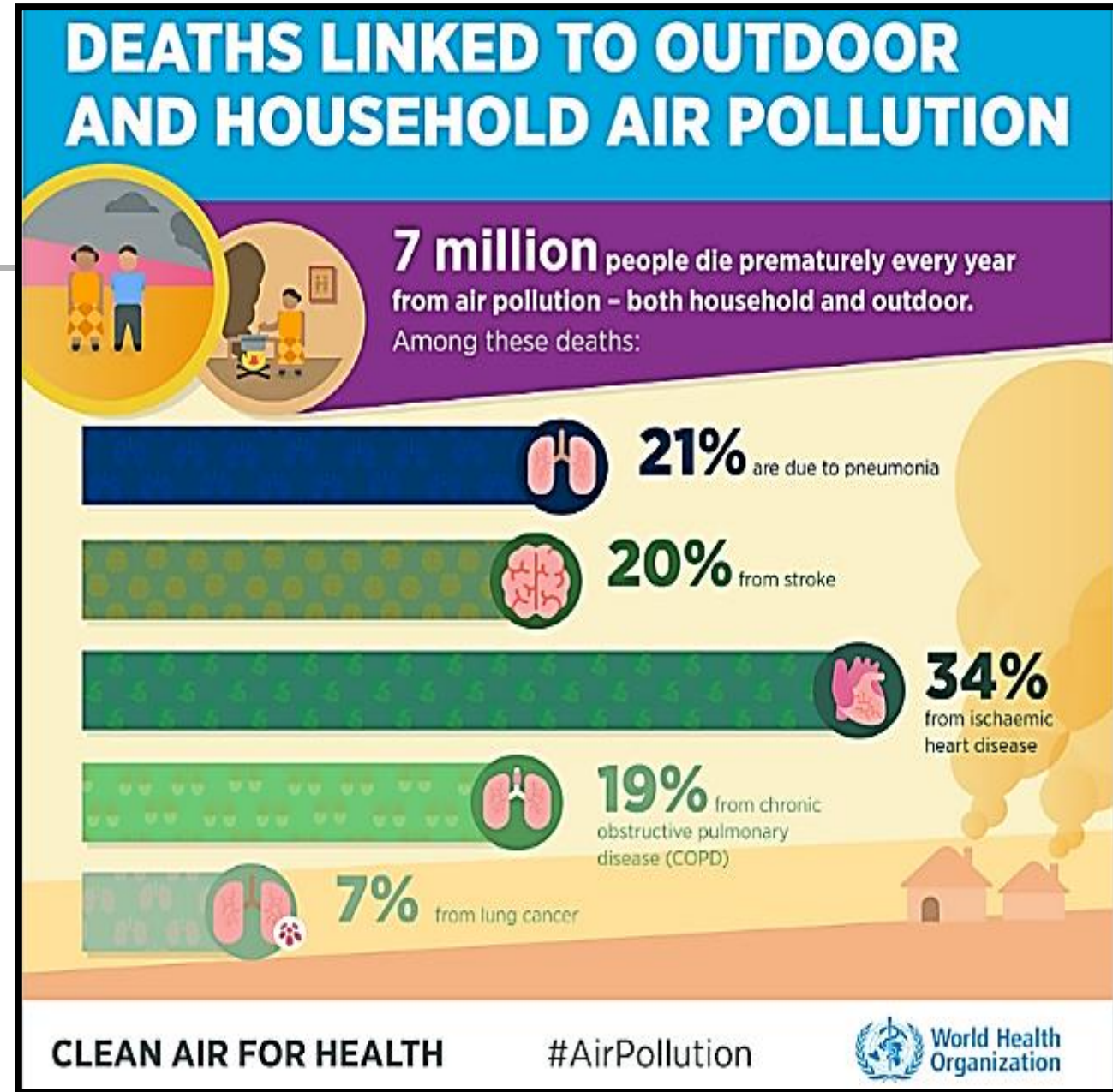


Pathogenesis of environmental diseases



Health Effects..

- **Adverse** vs. beneficial
- **Acute** vs. *delayed onset*
- **Clinical** vs. subclinical manifestations
- **Transient** (*reversible*) vs. *chronic* (*irreversible*)



Environmental health problems

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May be in form of

- Acute environmental catastrophes (*high-level exposures, Bophal disaster*)
- Chronic (*low-level*) exposures
- Indirect effects of global environmental changes



«*Homo sapiens*»
should be evolved to
«HOMO ENVIRONMENTUM»
for survival on the Earth with
the motto «Sustainable life»!

UN DAY : World Environment Day/WED 2021, 5 June 2021

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<https://youtu.be/3DOcQRI9ASc>

- The theme of this year's WED is **Ecosystem Restoration**. Pakistan will act as global host of the day-WED. **World Environment Day 2021** will see the launch of the **UN Decade on Ecosystem Restoration**.
- **Ecosystem restoration** can take many forms: Growing trees, greening cities, rewilding gardens, changing diets or cleaning up rivers and coasts. This is the generation that can make **peace with nature**. Learn more about **ecosystem restoration and the UN Decade..**



**PREVENTING, HALTING AND REVERSING
THE DEGRADATION OF ECOSYSTEMS
WORLDWIDE..**

The UN Decade on **Ecosystem Restoration** is a global rallying cry to heal our planet.
What will you restore?

World Environment Day 2022

The theme for World Environment Day 2022 had been "**Beating Air Pollution**", and the host country was China. **Biodiversity** and its importance is the theme for World Environment Day 2022.

World Environment Day 2023

Theme 2023: Focus on Solutions to Plastic Pollution



There has never been a more urgent need to revive damaged ecosystems than now!

Ecosystems support all life on Earth. The healthier our ecosystems are, the healthier the planet - and its people.

The UN Decade on Ecosystem Restoration

aims to prevent, halt and reverse the degradation of ecosystems on every continent and in every ocean. It can help to end poverty, combat **climate change** and prevent a mass extinction. It will only succeed if **everyone plays a part.**

TEN MORE YEARS TO RESTORE THE PLANET



Burning stubble is harmful for environment!

Better information for better health

✓ TRACKING CONNECTS ENVIRONMENT & HEALTH INFORMATION

Check out CDC's data explorer and state and local tracking programs for more information.



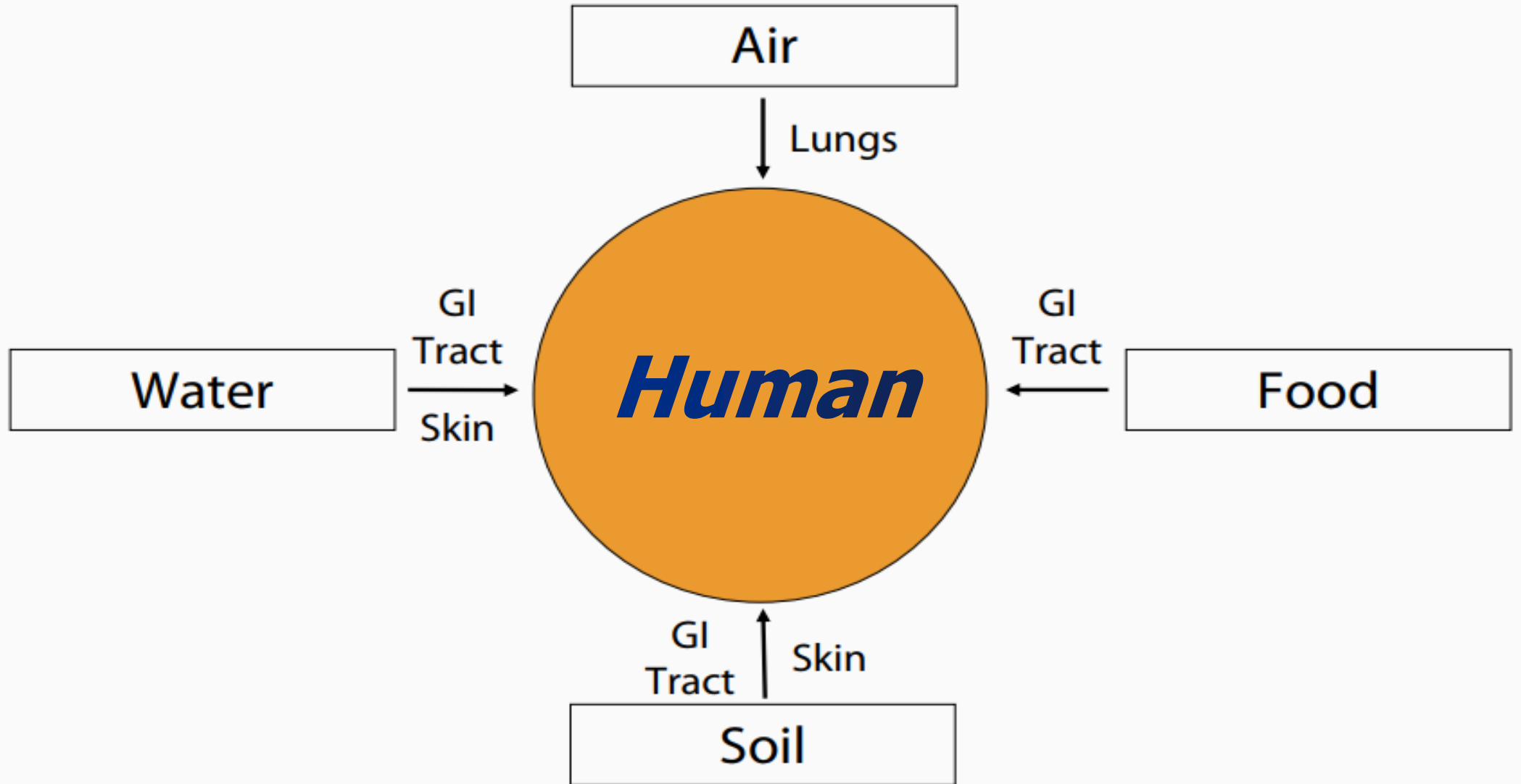
Basic Requirements for a Healthy Environment

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- Clean air
- *Safe and sufficient water*
- Safe and adequate food
- *Safe and peaceful settlements*
- Stable global environment



■ Routes of exposure through gaseous, liquid, and solid media

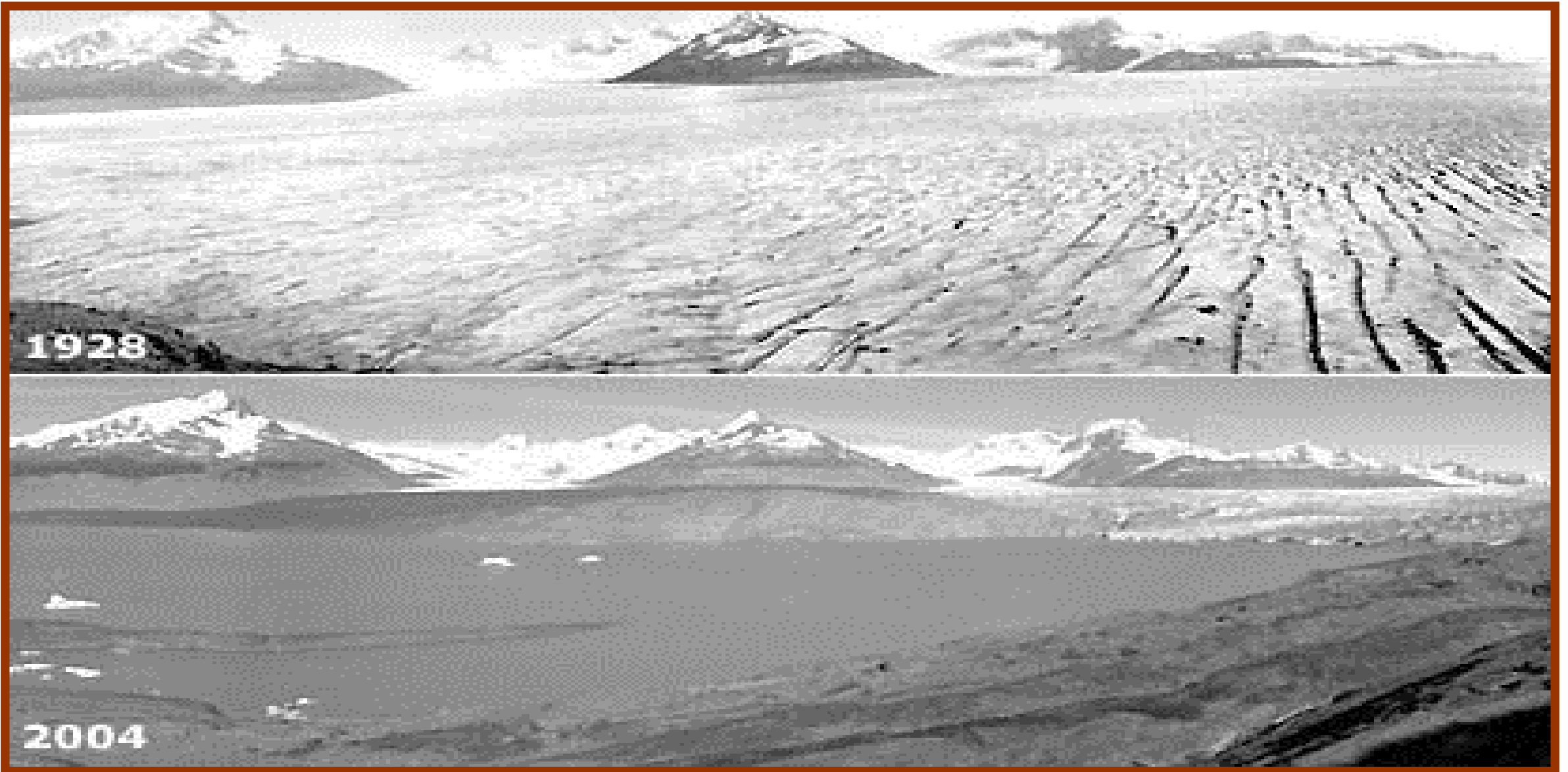


Global warming, cause greenhouse gases

Greenhouse gases consisting of CO_2 , CH_4 , and N_2O are mainly responsible for **global warming**.

HelpSaveNature.com

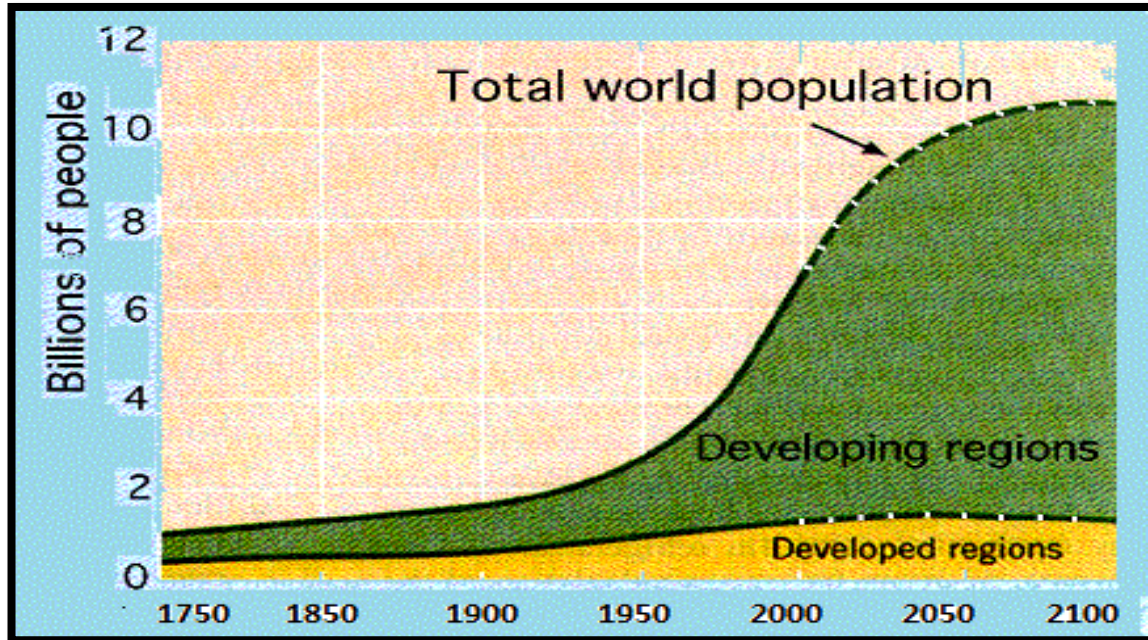
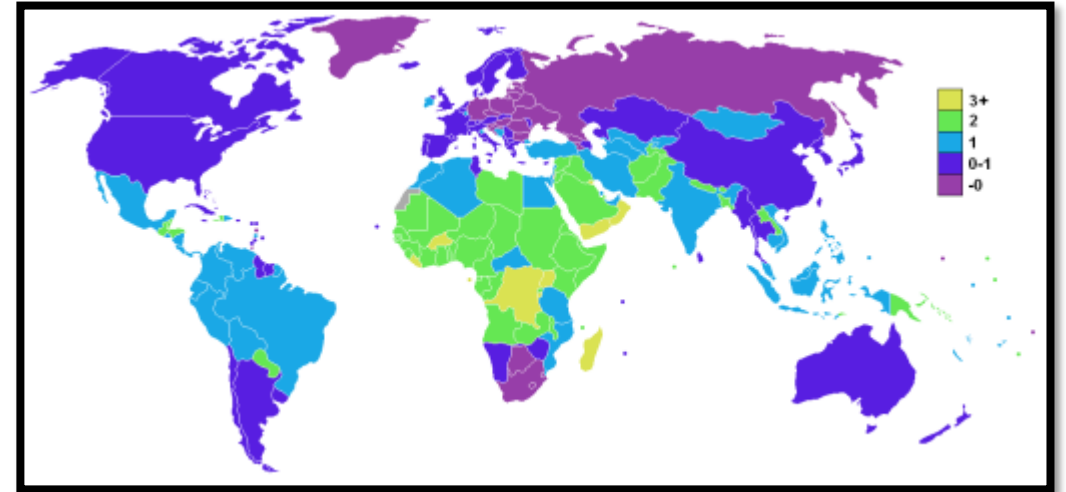
Global warming, glaciers are melting!



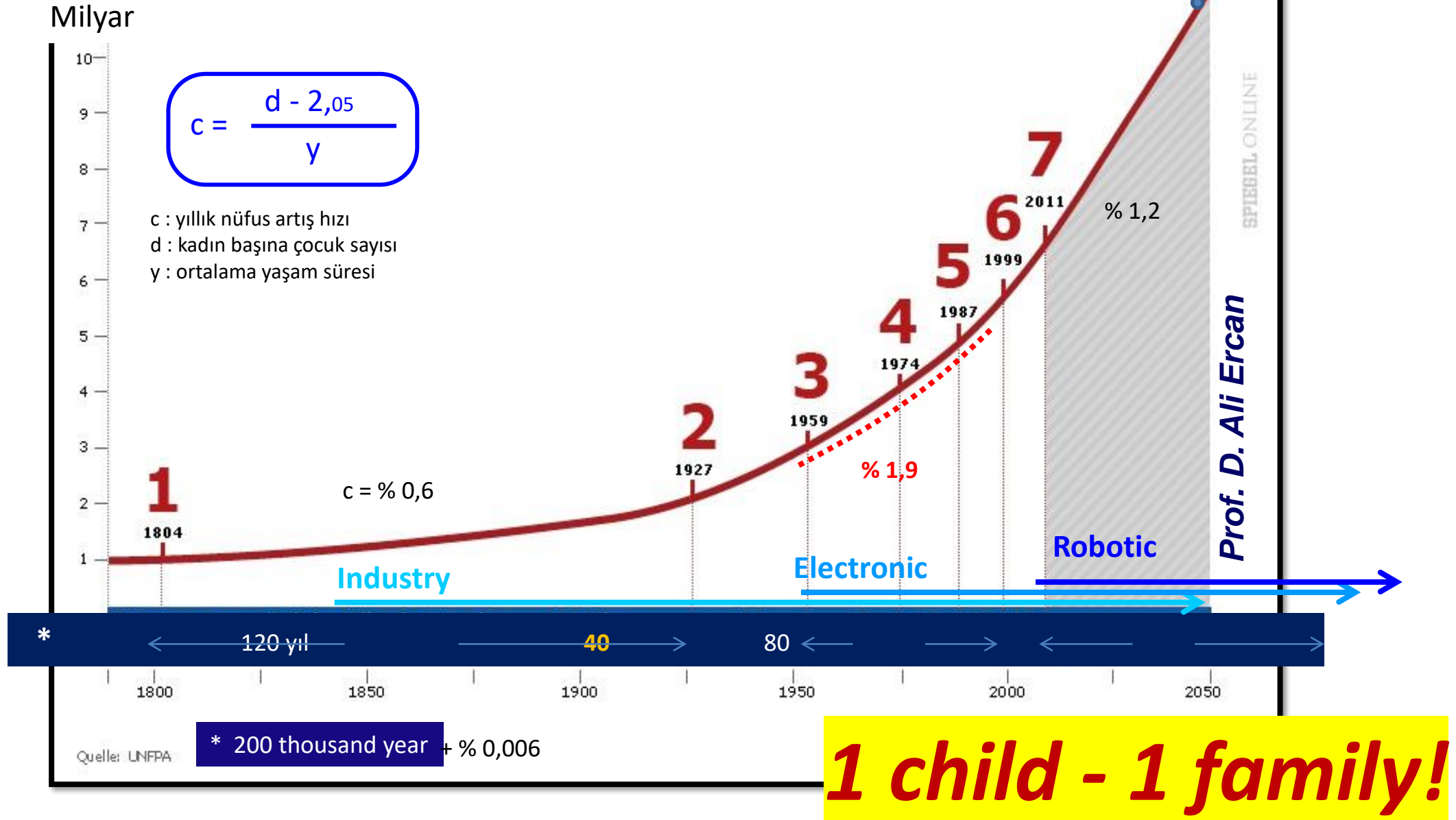
The Finite World is getting crowded and older!



1 child - 1 family!



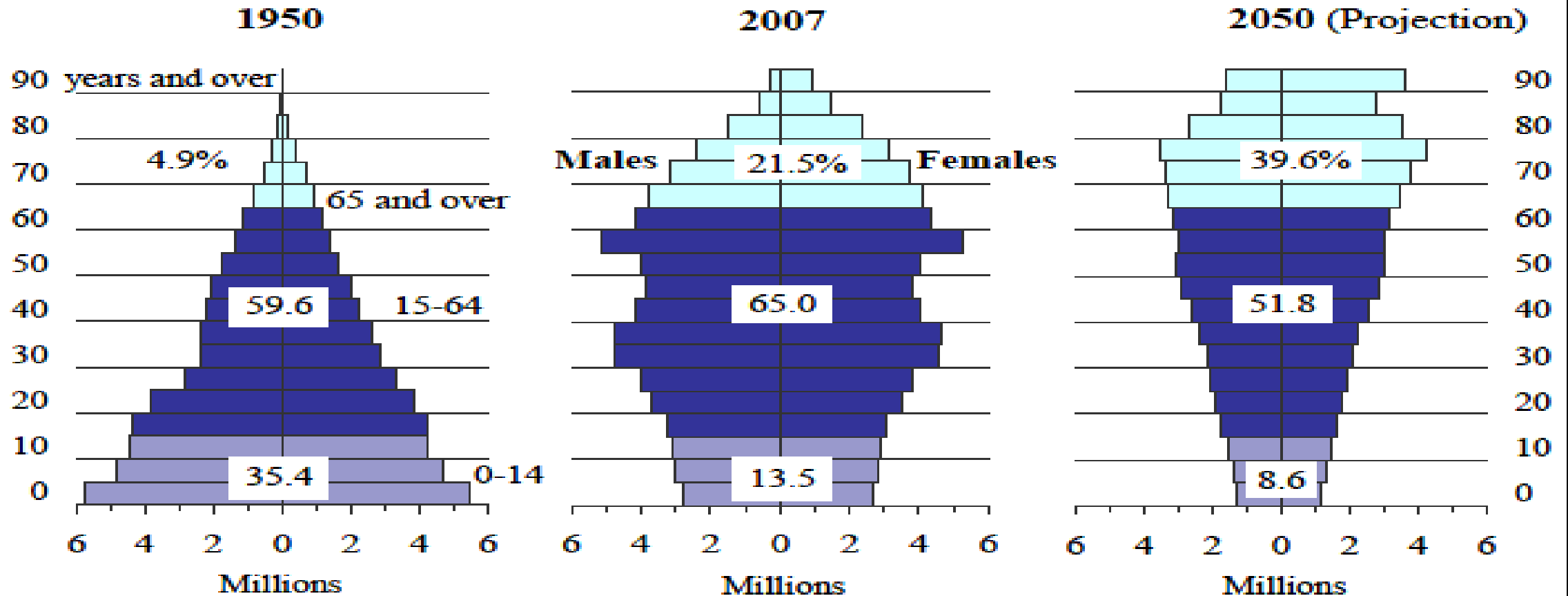
Increasing of World population



The world is growing rapidly and getting older!

Figure 2.3

Changes in the Population Pyramid



Source: Statistics Bureau, MIC; Ministry of Health, Labour and Welfare.

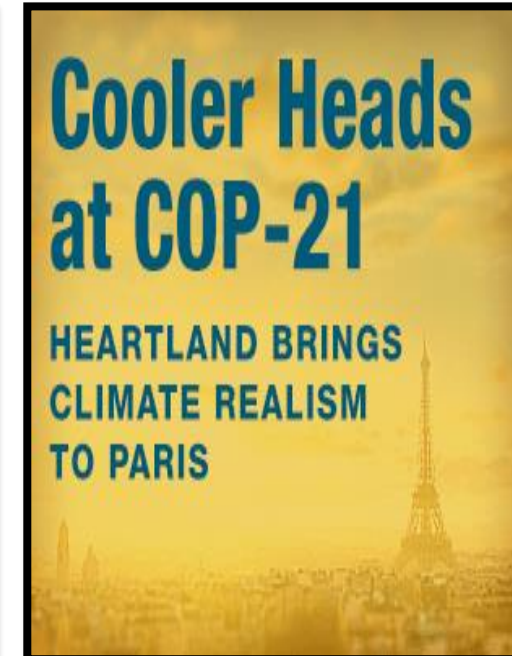
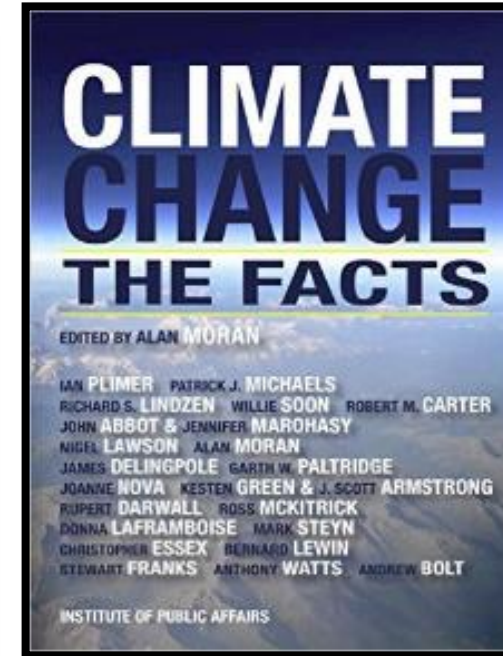
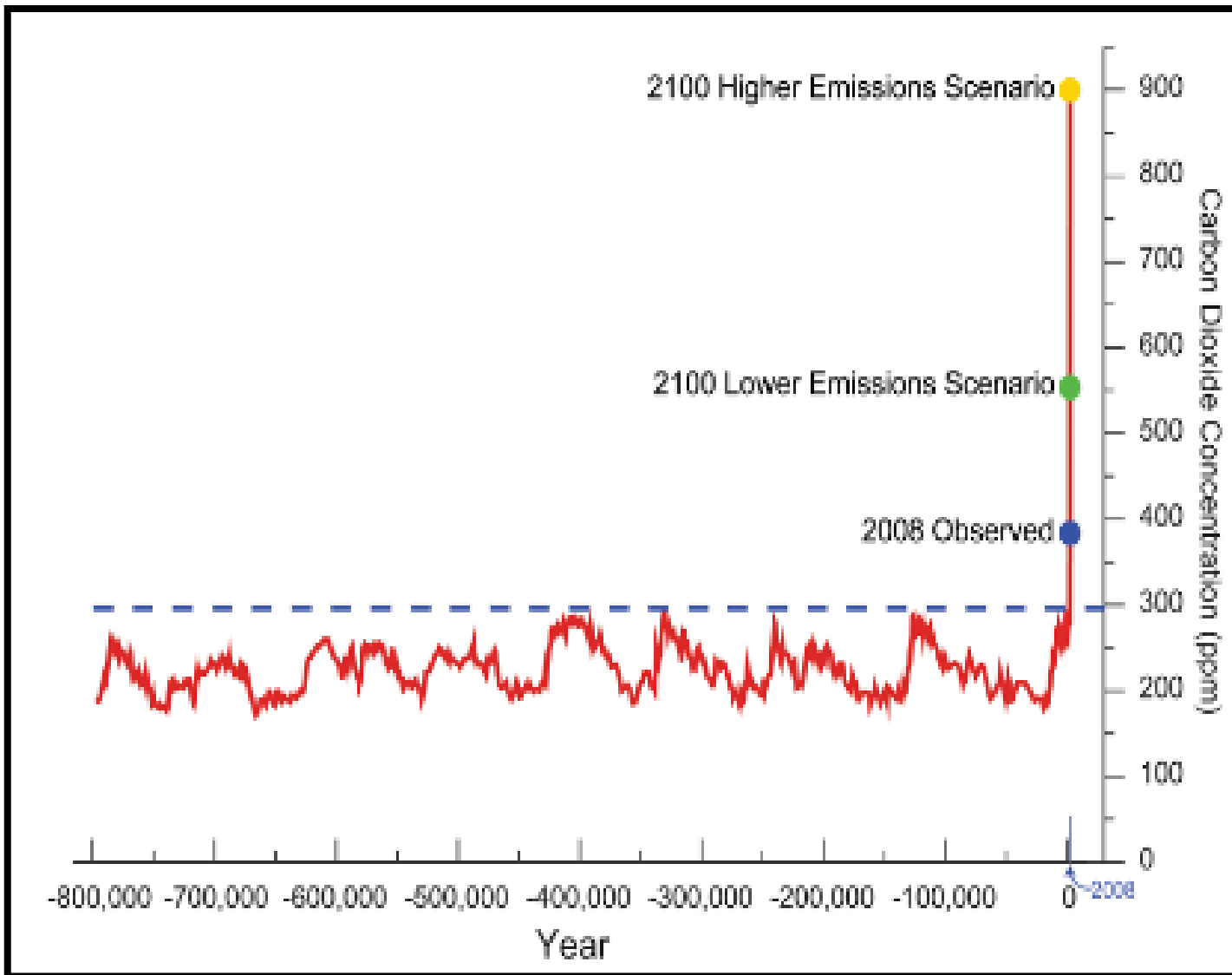
Every family must stay with 1 child!



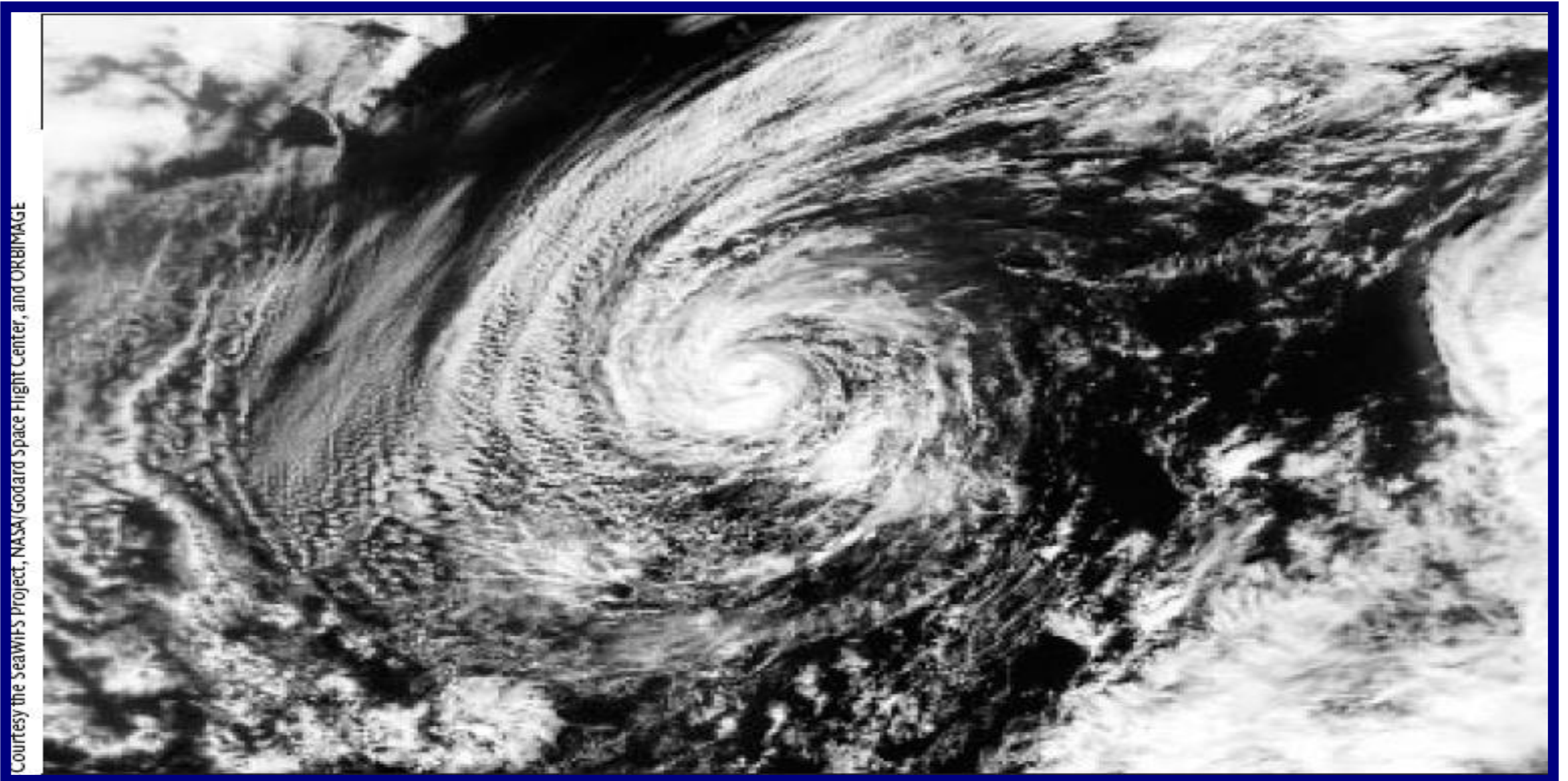
HUNGER, NO WATER!

1 child - 1 family!

Global emission is lasting !



Ecologic reactions : **Tsunami!..**



Ecological deterministic / inevitable outcome

Poverty, flood; diseases that cannot be prevented ..





...2 billion plastic bottles and..



**Everyday 2 millions of
pocket phones
to garbage...**

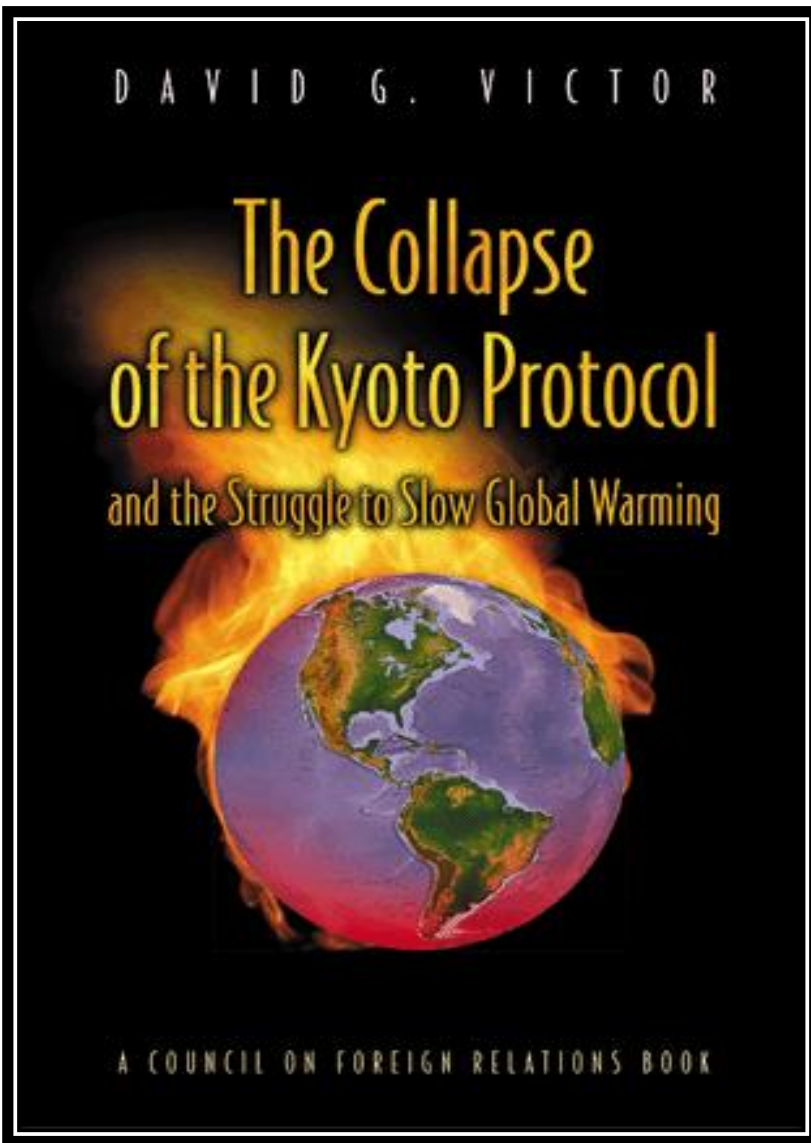
The species are disappearing!

doğa



The Millennium Ecosystem Assessment-2005

- In 2005, the largest ever assessment of the Earth's ecosystems was conducted by a research team of over 1,000 scientists. The findings of the assessment were published in the multi volume *Millennium Ecosystem Assessment*, which concluded that ***in the past 50 years humans have altered the Earth's ecosystems more than any other time in our history.***
- *Therefore* : *Environmental toxic - carcinogen - mutagenic - genotoxic ... chemicals accumulated in the human body, threshold values were exceeded. These chemicals are experiencing over-threshold (stochastic) negative effects, and we are even faced with an increasing **environmental disease epidemic!*** https://portals.iucn.org/library/efiles/documents/2005-027_Sum.pdf



*DAVID G. VICTOR
2001, Princeton Univ.*

17.03.2024

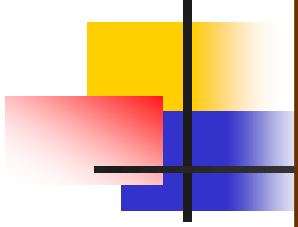
Crisis and Opportunity (pp. 3-24)

- ❖ Worldwide, legislatures are beginning the long process of deciding whether to ratify and implement the December 1997 "**Kyoto Protocol**." Widely hailed as a first serious step towards slowing **greenhouse warming**, the protocol requires each industrialized nation to cap its emissions at specific target levels.
- ❖ *Those targets apply to the "budget period" of 2008-12 and the protocol also envisions that nations will agree on caps for future budget periods.*
- ❖ Although public pressure to do something about **global warming is growing**, legislators will weigh the cost of compliance before they ratify the **Kyoto deal**.
- ❖ *One factor will loom large in the debate:...*

Environmental degradation

- ◆ While there is no global consensus on how best to fight environmental degradation, most people today recognize that humankind is on an unsustainable path.
- ◆ From pollution and *global climate change* to the World's voracious appetite for natural resources..



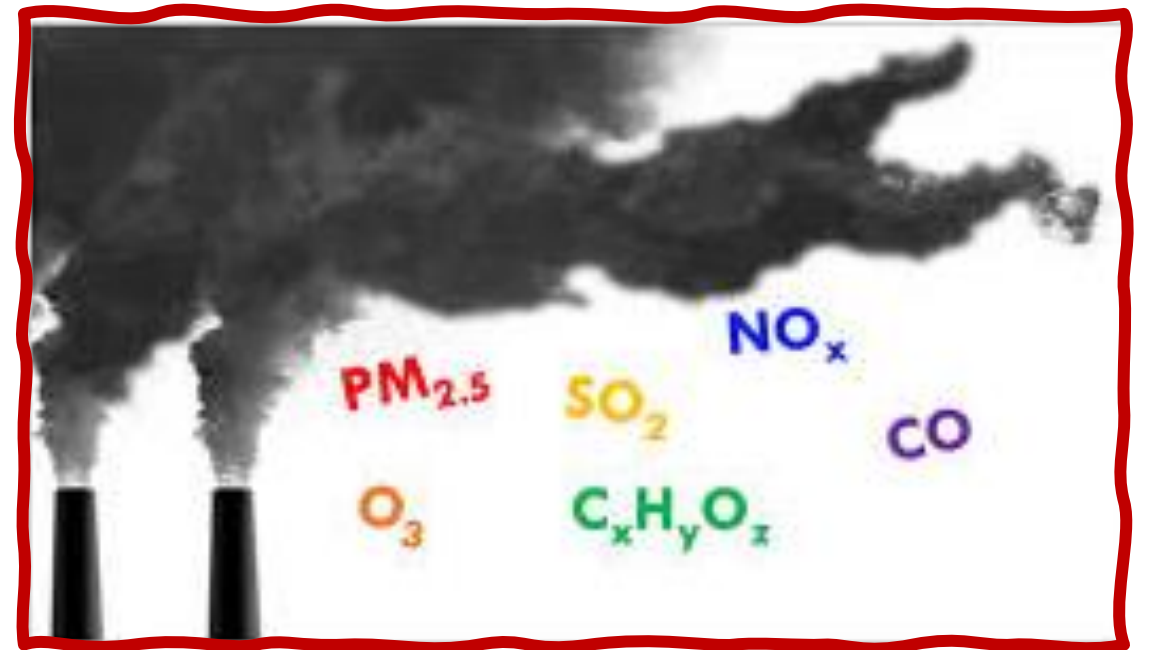


***The Nature, gets you seated on the "Red Sofa"
and conducts an serious exam!***



17.03.2024

Human beauty, evolved through millions years of **Evolution**; is it under threatening of *environmental pollution by repetitive DNA injury* ?!?



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Let's remember always..

- *“The world is not a heritage from our ancestors to us; it is a deposit that we take to transfer our children.”*

**Letter from : Indian Tribal President
Chief Seattle To USA President
Franklin Pierce, 1853**

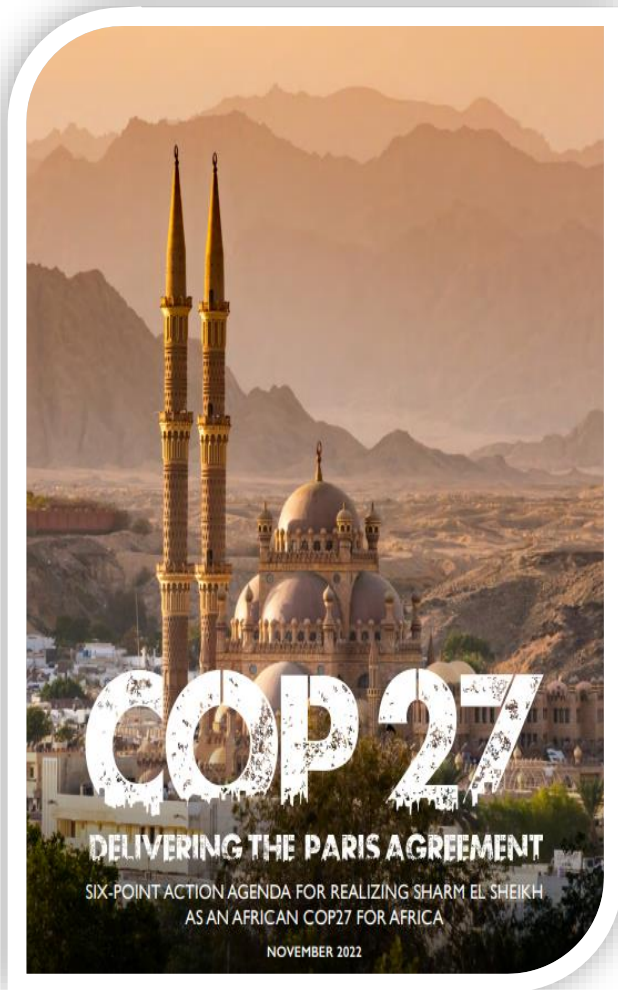
Chief Seattle's Speech Summary



COP26

Glasgow 2021

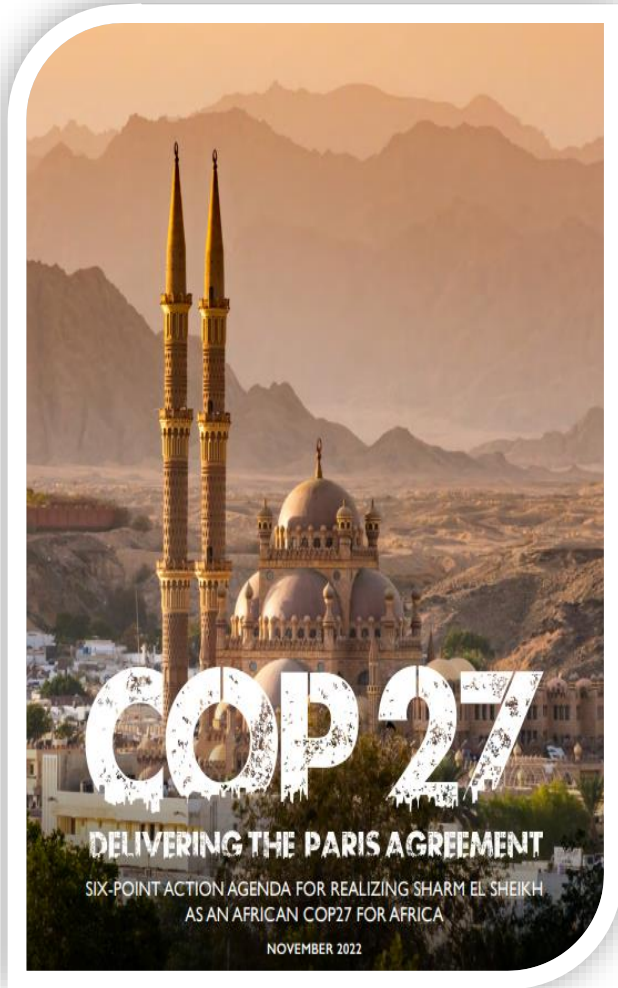




- ❖ The holding of the 27th session of the Conference of the Parties (**COP27**) of the **UN Framework Convention on Climate Change (UNFCCC)** in Sharm el Sheikh, Egypt, in November 2022 carries with it the hopes of the entire African continent for a successful outcome.
- ❖ Success at **COP27** for it to be an African COP, however, should be gauged not simply on reaching agreement on **COP decisions**, but rather, on reaching agreement on decisions that contribute to the further development of a **fair, equitable, effective, and ambitious multilateral climate regime** under the **UNFCCC** and its **Paris Agreement** that enhances international cooperation and increases support to African and other developing countries.

Take our quiz: What's your climattitude?

United Nations online platform for voluntary cancellation of certified emission reductions (CERs) (climateneutralnow.org) 20.3.23



❖ FOUNDATIONAL PRINCIPLES FOR COP27

❖ Any endeavour under which ***international cooperation*** is to be undertaken should be based on certain principles that are agreed by all the participants, and which form the foundation for further action. In the multilateral climate change context, these principles that are founded on ideals of ***fairness and cooperation*** have been explicitly indicated in ***the UNFCCC and its Paris Agreement***.

Take our quiz: What's your climattitude?

United Nations online platform for voluntary cancellation of certified emission reductions (CERs) (climateneutralnow.org) 20.3.23



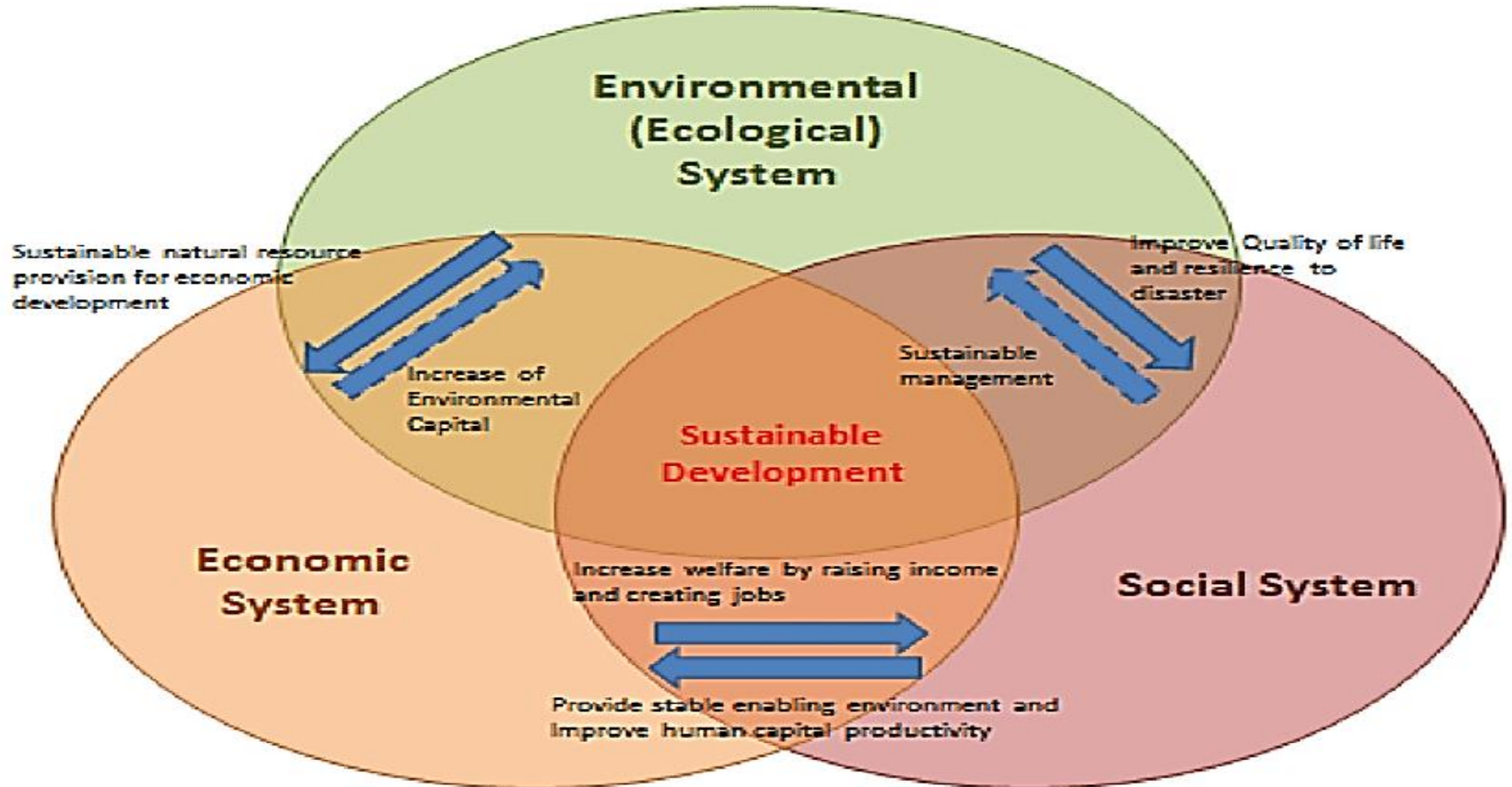
❑ Equity and fair shares

- ❑ In its most distilled essence, the principle of common but differentiated responsibilities and respective capabilities reflects the idea of equity being applied to international cooperation to combat climate change.
- ❑ It recognizes that while **climate change is a global problem** that will require **global solutions**, its underlying causes stem from **unequal** and **inequitable** historical conditions such that these must be addressed and remedied as part of the **global solution**.

❖ FOUNDATIONAL PRINCIPLES FOR COP27

- *Africa is the least contributor to global greenhouse gas emissions with less than 4% of total global emissions and yet the **most adversely impacted region**...*
- As **COP27** takes place in Africa this November 2022, there are high expectations that “**The African COP**” will deliver substantive progress and implementable climate actions on the **priority issues** for Africa and other developing countries...
- ***Solidarity, multilateralism, and international cooperation.***
- Common but differentiated responsibilities and respective capabilities.

Systematic approach to the environment



The UNEP-1

Place and Establishment :

1. UNEP was established by Maurice Strong, its first director, after the United Nations Conference on the Human Environment in Stockholm in June 1972¹.
2. It serves as the **coordinating body** for environmental issues within the **UN system**.

1.Responsibilities :

1. **Promoting International Cooperation:** UNEP fosters collaboration on global environmental matters. It encourages nations to work together to address pressing challenges.
2. **Guidance to UN Organizations:** UNEP provides guidance to other UN agencies, ensuring that environmental considerations are integrated into their work.
3. **Scientific Advisory Groups:** Through its scientific advisory groups, UNEP encourages the international scientific community to participate in formulating policies for various UN environmental projects.

<https://www.britannica.com/topic/United-Nations-Environment-Programme>, 15.3.24

The UNEP-2

Contributions and Funding :

1. UNEP relies heavily on **voluntary contributions** for **95%** of its income.
2. **Voluntary contributions** include support for the **Environment Fund** (*UNEP's core fund*) and earmarked funds.
3. These contributions are complemented by a smaller portion from the **UN regular budget** (around 5% of income).
4. The **Environment Fund** provides flexible funds that form the bedrock of UNEP's work worldwide.
5. Each member state contributes based on their capacity, as determined by the **Voluntary Indicative Scale of Contributions (VISIC)**.
6. UNEP's mission is made possible by partners who fund and champion its work. <https://www.unep.org/who-we-are/about-us>, 15.3.24

The UNEP-3

Focus Areas :

1. UNEP's work centers around:

1. Transitioning to **Low-Carbon** and
Resource-Efficient Economies

2. Strengthening Environmental Governance
and Law

3. Safeguarding Ecosystems

4. Providing Evidence-Based Data
for Informed Policy Decisions⁵.

In summary, UNEP plays a crucial role in advancing global *environmental cooperation, policy formulation,* and *sustainable development (sustainable LIFE!).*

<https://www.unep.org/who-we-are/about-us>, 15.3.24



CONCLUSION-1

10 key points

that should be emphasized in a **systematic approach to environmental health...**

1. Risk Assessment : Begin by assessing the risks associated with environmental factors.

Identify potential hazards and evaluate their **impact on human health**.

2. Exposure Pathways : *Understand how humans come into contact with environmental agents. Consider **air, water, soil, and food** as pathways for exposure.*

3. Chemical Exposure : Investigate chronic low-dose chemical exposures. These can have adverse health effects, especially when widespread or affecting **vulnerable populations**.

4. Epidemiological Studies : *Rely on systematic reviews and meta-analyses (SRMAs) to examine **associations between chemical exposures and health outcomes**.*

*Ensure clear study questions and sound methods for revealing **causal relationships**.*

5. Data Extraction : Properly extract relevant data from studies.

Pay attention to exposure heterogeneity and other biases.

CONCLUSION-2

10 key points

that should be emphasized in a **systematic approach to environmental health**

6. Policy Implications : Integrate policy implications into SRMAs (Systematic Reviews & Meta Analysis). Consider how findings impact public health decision-making.

7. Population Size : Many studies involve large populations.
Understand the implications of findings at this scale.

8. Positive Associations : Note that associations are often positive and statistically significant.
Investigate **potential causality**.

9. Guidelines : Develop and adopt **EH-specific SRMA** (Systematic Reviews & Meta Analysis) **guidelines**.
These will strengthen tools for decision-makers.

10. Translation to Practice : Translate up-to-date **scientific research** into accessible evidence for **risk assessment, policy formulation, and individual health behaviors**.


Remember that a systematic approach ensures rigorous evaluation and ***informed decision-making*** in environmental health.



BILL GATES

**HOW TO
AVOID A
CLIMATE
DISASTER**


THE SOLUTIONS WE HAVE AND THE
BREAKTHROUGHS WE NEED



*Try to keep
minimum your
carbon footprint..
Live green...*


ipcc
INTERGOVERNMENTAL PANEL ON climate change

Climate Change 2022
Impacts, Adaptation and Vulnerability
Summary for Policymakers



WGII

Working Group II contribution to the
Sixth Assessment Report of the
Intergovernmental Panel on Climate Change



Thank You