

One Earth, One Future, Fungi are part of the solutions



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Outline

- ❑ **International Day for Biodiversity**
- ❑ **Egypt's Biodiversity**
- ❑ **Why biodiversity matters?**
- ❑ **Our Earth is suffering**
- ❑ **The solutions are in nature**
- ❑ **Building our common future**
- ❑ **Fungi are part of the solutions**

International Day for Biodiversity 2022

Background/slogan

- Raising awareness.
- Adoption of the CBD text in Nairobi on 22 May 1992.
- This year's slogan **“Building a shared future for all life”**
- Continue building momentum and support of the post-2020 Global Biodiversity Framework.



**BIODIVERSITY
DAY 22 MAY**

Biological Diversity

Ecosystems



Genes



Species



Egypt's biodiversity profile

Why biodiversity matters?

In figures

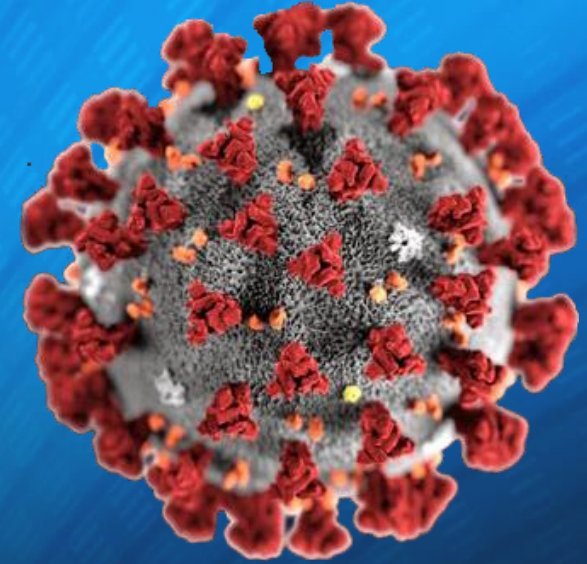
- ❑ Economic evaluation of ecosystem services.
- ❑ Forests provides livelihoods for at least 1.6 billion people.
- ❑ Four billion people rely on medicine from natural sources.
- ❑ Fishes are main source of protein for about 3 billion people.
- ❑ Some 70% of cancer drugs are natural or synthetic inspired by nature.
- ❑ 75% of the global food crops rely on animal pollination.
- ❑ Insect pollinators contribution to the annual global food economy is more than 200 billion USD.
- ❑ Natural ecosystems are the sole sink for carbon of human origin. They can absorb some 60% of the annual emissions.



Why biodiversity matters?

Biodiversity and Health

- ❑ Linkages with pandemics, and new emerging infectious diseases.
- ❑ Role in human nutrition and food security.
- ❑ 60% of the world's population rely on traditional medicine.
- ❑ **Human Health is influenced by the health of ecosystems**



Why biodiversity matters?

Climate change and natural hazards

- ❑ Carbon regulator and sequestration.
- ❑ Flood protection, shoreline protection, regulation of soil erosion and temperature.
- ❑ Forests and green spaces help mitigating drought and extreme weather events.
- ❑ Minimize vulnerability to climate change and enhance resilience.



Why biodiversity matters?

Economy and livelihoods

- ❑ Marginalized and poor communities.
- ❑ True resource users utilize the resource wisely.
- ❑ CBNRM
- ❑ Recreational and touristic values.
- ❑ Economic evaluation of ecosystem services.
- ❑ Biodiversity conservation contribute to ending poverty and increasing national income.



Why biodiversity matters?

The Sustainable Development Goals

- Half of the world's population is dependent on nature for their livelihoods (forestry, Agri, fisheries).
- Provides basis for many economic activities.
- Aichi targets and SDGs.
- Biodiversity and ecosystem services contribute directly to human wellbeing and development priorities.



Our earth is suffering

1- Loss of Biodiversity

The environmental crises

- ❑ Human activities lead to changes (mostly irreversible) in the diversity of living organisms.
- ❑ During the past 50 years, biodiversity is declining faster than at anytime in human history. The decline will continue to increase.
- ❑ Species extinction is at least tens to hundreds of times higher than anytime in the entire recorded history of earth.
- ❑ One million species face extinction, many of them within decades (25% of the assessed animal and plant groups)
- ❑ 75% of land surface is significantly altered
- ❑ 66% of the ocean area is suffering cumulative impacts.
- ❑ 85% of wetlands area has been either lost or damaged.

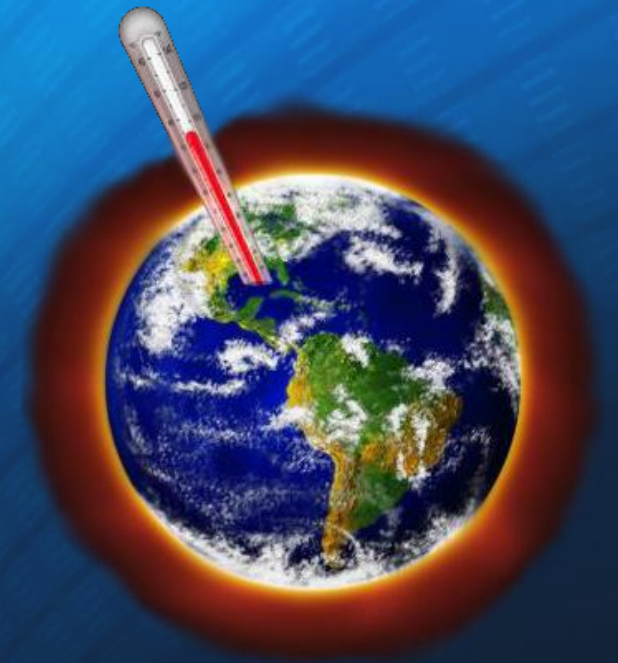


Our earth is suffering

The environmental crises

- ❑ Examples of impacts:
 - ✓ Average global temperature is raised about 0.76°C during 1850-2005.
 - ✓ Average sea level rise is about 12-22 cm during past century.
 - ✓ Projections confirm continuous rise of global temperature to reach $1.4 - 5.8^{\circ}\text{C}$ by 2100.
 - ✓ This will lead to continuous sea level rise, increase extreme weather events, shift in patterns of rain and vector borne diseases
 - ✓ More loss of biodiversity and ecosystem degradation.

2- Climate change



Our earth is suffering

The environmental crises

Air pollution

- ❑ 4.2 – 7 million people die annually.
- ❑ 9 out of 10 breathe air contains high level of pollutants.
- ❑ 258,000 died in Africa in 2017.
- ❑ 400,000 died in Europe in 2012
- ❑ Pollutants and particles contributed to spread of COVID
- ❑ Sources: industrial, vehicles, burning biomass, dust storms.

Plastic

- ❑ Global production swelled from 2 million ton in 1950 to 419 million ton in 2015.
- ❑ Ocean pollution has increased 10 times since 1980.
- ❑ In 2040: oceans receive 29 m.t. or 600 m.t. (microplastics).
- ❑ Directly affects 267 species of marine mammals, turtles and seabirds.

3- Pollution

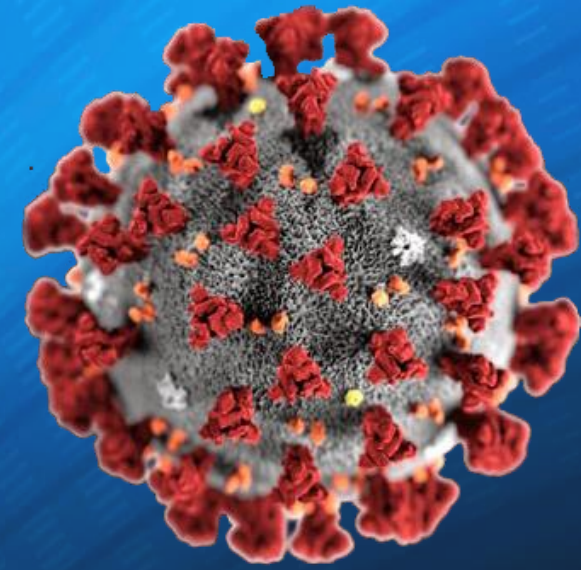


Stop the plastic tap

Our earth is suffering

One of the implications

COVID-19 Pandemic



The main suspect
Horseshoe Bat



Transferred due
to direct contact

Through one or
more hosts
(Pangolin)

Due to
pressures on
animal

What does it
mean>

**Illegal
wildlife trade
is the main
driver**

Our earth is suffering

Am I part of this suffering?



**Mass irresponsible
tourism**



Our earth is suffering

Am I part of this suffering?



**Corals
destruction**

Our earth is suffering

Am I part of this suffering?



Urbanization



Our earth is suffering

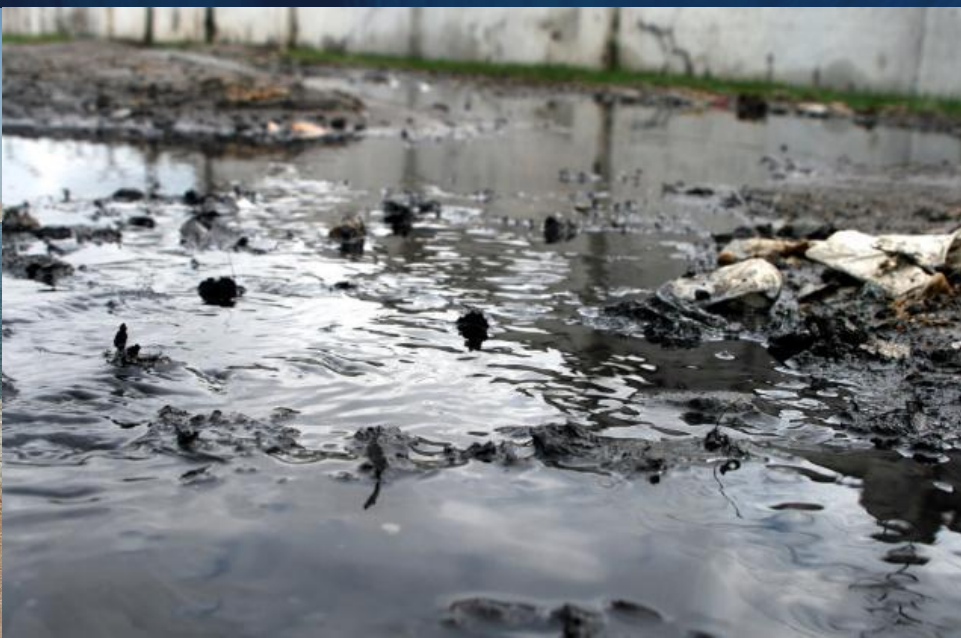
Am I part of this suffering?



**IUU
fishing**

Our earth is suffering

Am I part of this suffering?



Pollution

Our earth is suffering

Am I part of this suffering?



**Over
exploitation**

Our earth is suffering

Am I part of this suffering?



Plastics

هل نحن جزء من المشكلة



**Irresponsible
safari**

Our earth is suffering

Am I part of this suffering?



**Oil
pollution**

Our earth is suffering

Am I part of this suffering?



overgrazing

Our earth is suffering

Am I part of this suffering?

Alien Invasive Species



The solutions are in nature

Lessons learned from the pandemic

- ❑ A turning and stepping point.
- ❑ Protecting the environment and nature is not a luxury and is no longer an option.
- ❑ Radical changes must be taken for nature and people.
- ❑ Nature should be at the heart of development.
- ❑ Building back better.
- ❑ No way to save the planet except by addressing:
 - ✓ Global warming and its implications.
 - ✓ Destruction of habitats and ecosystems
 - ✓ Loss of species and genetic diversity.



The solutions are in nature

Green Recovery

- ❑ Rebuilding the economy to compensate for the losses while the environmental crises still exist.
- ❑ The recovery plans will undoubtedly influence those crises for decades.
- ❑ Economic recovery plans must have long-term positive effects and be consistent with the pillars and criteria of sustainability.
- ❑ Such plans must be inclusive, address issues of inequality and poor communities, and support better human health, taking into account the impacts on climate change, biodiversity loss, and environmental protection.



The solutions are in nature

Green Economy

- ❑ **Main elements:**
 - ✓ **Low emissions development.**
 - ✓ **Efficiency in resource use.**
 - ✓ **Socially inclusive.**
- ❑ **It considers the protection of the natural capital as one of the most important economic assets.**



The solutions are in nature

Nature Based Solutions

- The UNEA resolution formally adopted the definition of nature-based solution as “actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits”.



The solutions are in nature

The One Health

- ❑ Tripartite and UNEP support OHHLEP's definition.
- ❑ **One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.**
- ❑ Most of human infectious diseases are zoonotic and exist in the ecosystems (over 200 zoonotic diseases).
- ❑ Can't be eliminated through efforts of one sector.
- ❑ Foodborne diseases: 600 million cases and 420,000 die every year due to contaminated food.
- ❑ **Antimicrobial resistance:** The environment and animals play a critical role in keeping the drug resistant microbes.



The solutions are in nature

Building a shared future for all life

- ❑ We have to continue building momentum.
- ❑ The post-2020 global biodiversity framework.
- ❑ The GBF represents an opportunity to reshape our relationship with nature.
- ❑ **Everybody can have a role** to achieve the GBF and the 2050 biodiversity vision of:

”Living in harmony with nature”



Convention on
Biological Diversity

22 أيار/مايو 2020
اليوم الدولي
للتنوع البيولوجي
حلولنا في الطبيعة



٢٢ أيار/مايو ٢٠٢١
يوم التنوع البيولوجي
نحن جزء من الحل
#من_أجل_الطبيعة



UNITED NATIONS DECADE ON
**ECOSYSTEM
RESTORATION**
2021-2030

Fungi are part of the solutions

Healthy ecosystems

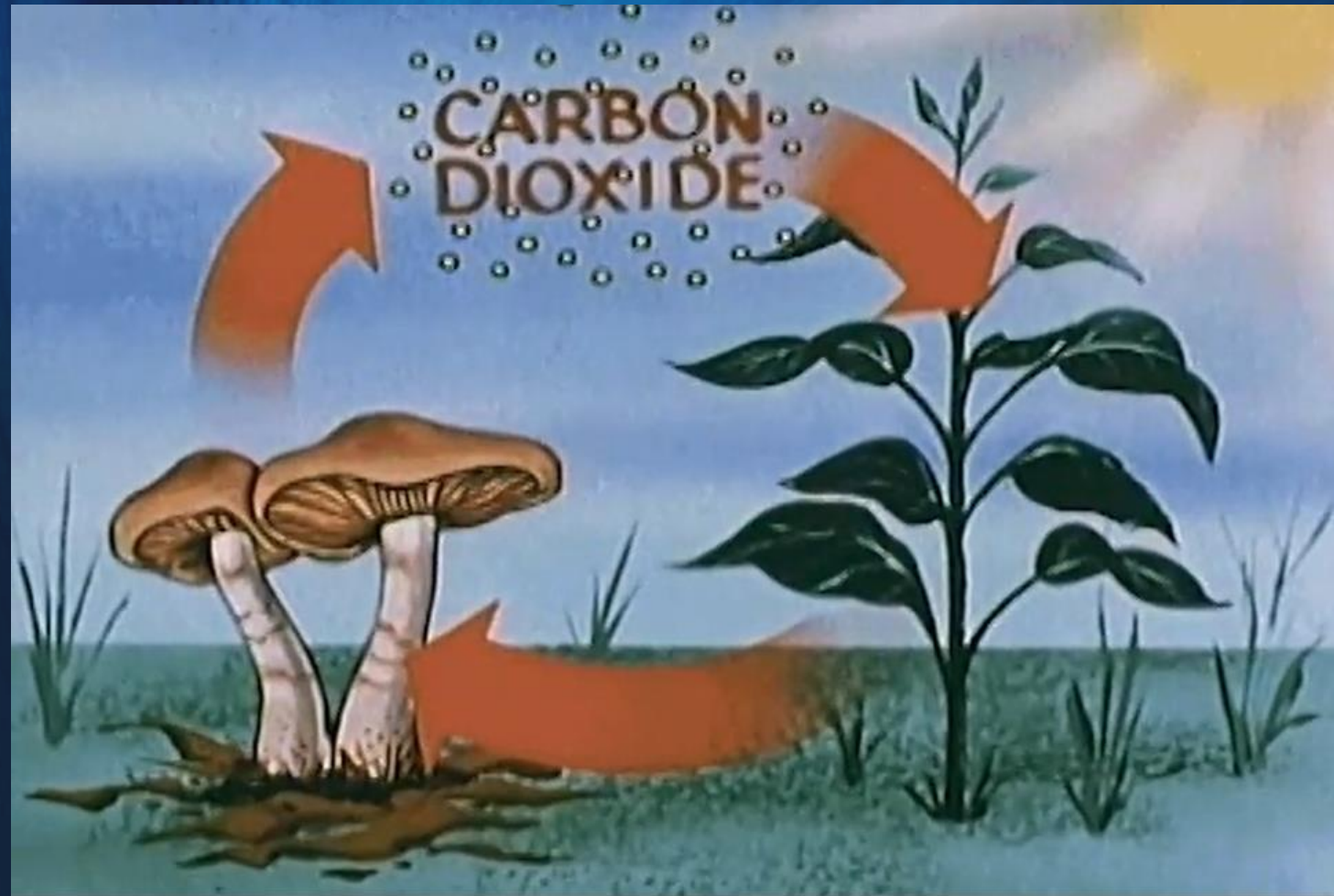
- ❑ Important part of soil biodiversity.
- ❑ Fungi colonize most habitats on Earth.
- ❑ Fungi are important decomposers in the ecosystems.
- ❑ Digestion before ingestion (degrade many insoluble molecules).
- ❑ Recycling of nutrients in the terrestrial ecosystems.
- ❑ Boosting nitrogen fixation and phosphorus mobilization.



Fungi are part of the solutions

Climate regulation

- ❑ Important player in carbon cycle through:
 - ✓ Decomposition of plants and animals.
 - ✓ Mutualistic symbiosis with plant roots.
- ❑ Soil carbon sequestration (with plants).
- ❑ Also release of carbon essential for photosynthesis.



Fungi are part of the solutions

Symbiosis

- ❑ Crucial mutualistic symbiosis.
- ❑ **Lichens:** complex of microorganisms (fungi and algae)
 - ✓ Keystone species in many ecosystems.
 - ✓ Food source, habitat, nesting elements,....etc
- ❑ **Higher plants:** mycorrhizal relationship
 - ✓ Essential for the survival of up to 90% of trees and grasses.
- ❑ **Animal mutualism:**
 - ✓ Insects like scale insects and leaf-cutting ants



Fungi are part of the solutions

Human Health and Nutrition

- ❑ The edible mushrooms as nutritious food:
 - ✓ Vitamins B, C, D and minerals
 - ✓ Good source of protein
 - ✓ Cultivated on Agri waste
- ❑ Antibiotics: penicillin and cephalosporins.
- ❑ Antibiotic production system:
 - ❑ Metabolites of mushrooms inoculated with bacteria.
- ❑ Antivirals, antidiabetics, anti-oxidants, anti-tumor,...



Fungi are part of the solutions

Reduce pollution

- ❑ Help degrade many pollutants like plastics, pharmaceuticals, and oils.

Ecosystem restoration

- ❑ Help reforestation by improving soil health, soil biodiversity, and controlling pests.



Fungi are part of the solutions

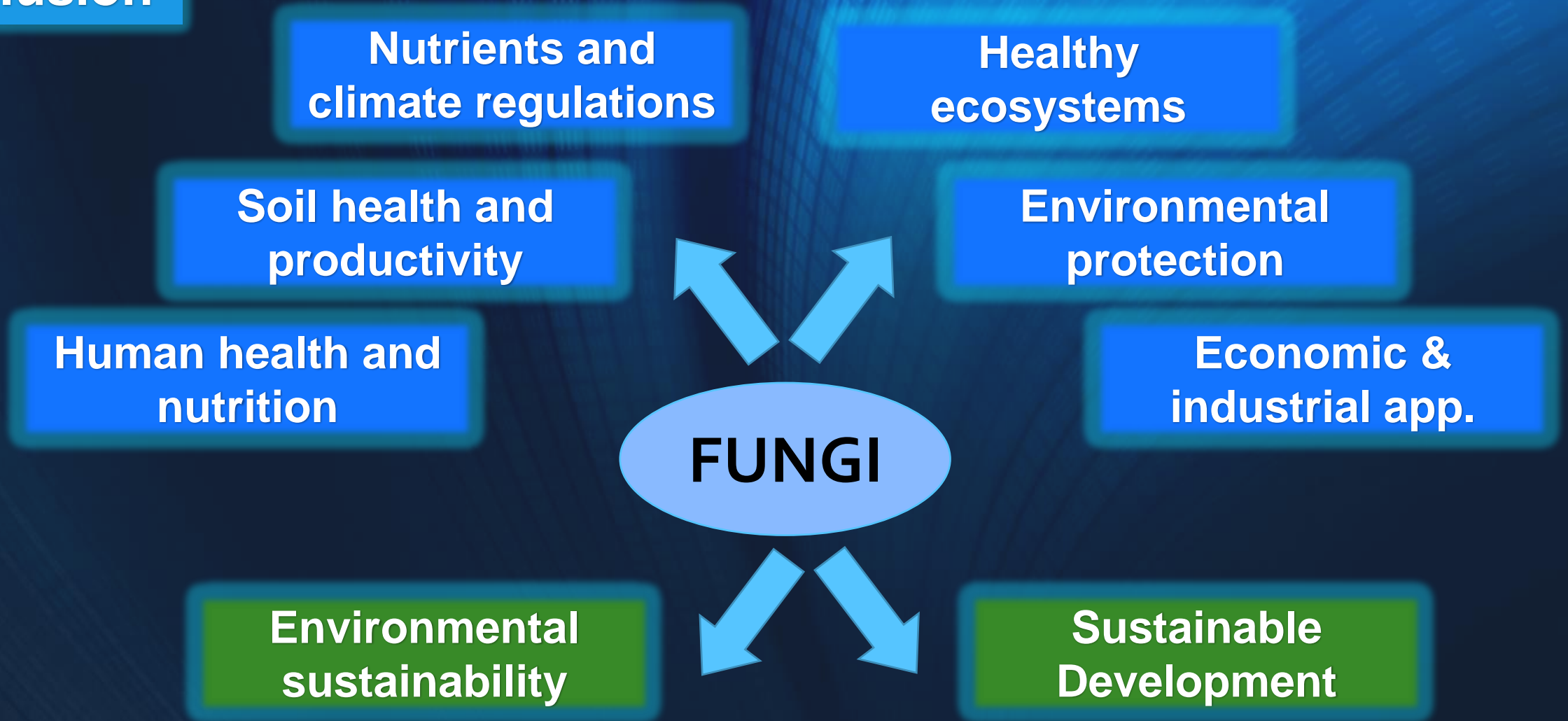
Economic, industrial, and engineering applications

- ❑ Mycelium is used for producing sustainable biodegradable replacements of plastic and animal-based products:
 - ✓ Clothes, shoes, leather, and packaging.
- ❑ Fungus bricks could be a portable and durable construction material.
- ❑ Potential use in water filtering.
- ❑ Fungal enzymes are preferred over chemical catalysts in many industrial applications like in food, textile, agriculture and human health



Fungi are part of the solutions

Conclusion

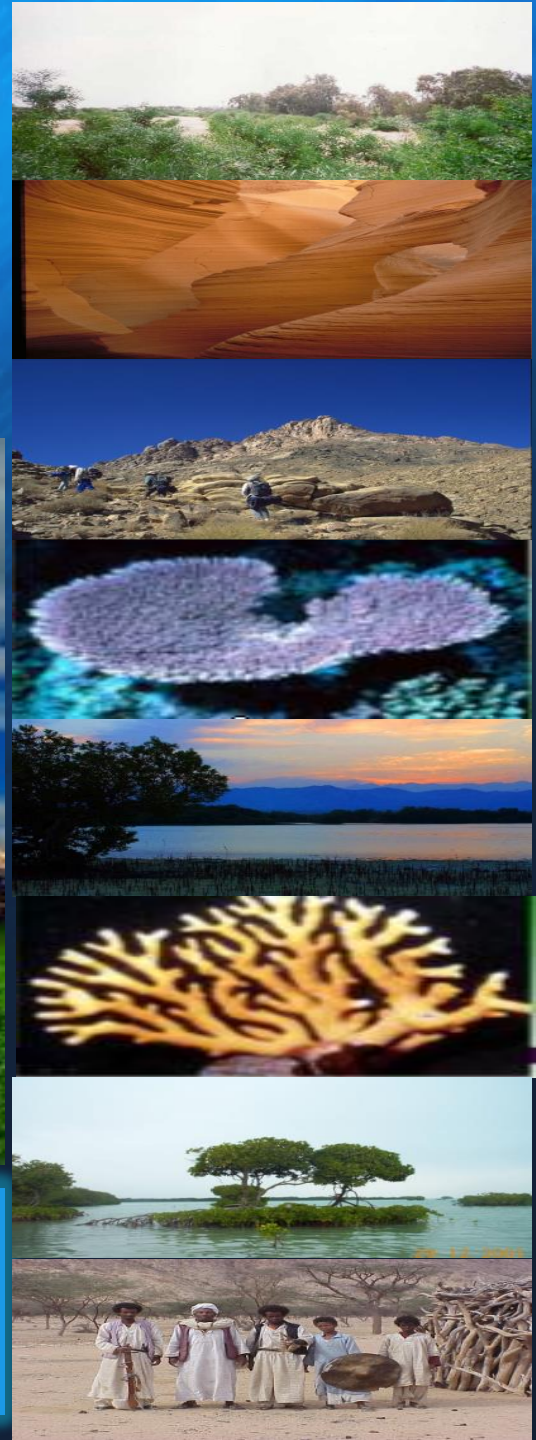


Finally

**Don't be part of the
environmental crises**



**Be part of the solutions to
build our shared future**



A white rectangular card is centered in the frame, featuring the words "thank you!" in a gold, elegant serif font. The card is surrounded by a variety of colorful glass marbles in shades of blue, green, and white. The background is a soft-focus field of these marbles, creating a vibrant and textured environment. The lighting is bright and even, highlighting the reflective surfaces of the glass and the clean lines of the card.

thank
you!