Definition of Biodiversity.

**Biodiversity:** The term Biodiversity consists of ‘biology’ and ‘diversity’.

Biodiversity is the variety of life on Earth (plants, animals, fungi, microorganisms), including the genetic, the species, communities, habitats, and ecosystem level.

Definition of Ecosystem.

**Ecosystem:** The term consist of ‘ecology’ and ‘systems’.

A biological community of interacting organisms and their physical environment. The ecosystem consists of biota, water, soil, and air.
Which ecosystems and parts of the ecosystem are affected by plastic pollution?

Major ecosystems include:
- agro-ecosystems (agricultural areas; silvicultural areas)
- aquatic ecosystems (lakes, swamps, moorlands, rivers, brooks, ponds)
- coastal ecosystem (beaches, rocky shores, mangroves, salt marshes)
- marine ecosystems (algal reefs, coral reefs, seagrass beds, benthic systems)
- terrestrial ecosystems (prairie, deserts, forests, rainforest, savanna, steppe, taiga, tundra, urban ecosystem, cities, villages, communities)

All of them are affected by plastic pollution, and some of them are places of origin of plastic pollution, such as agro-ecosystems, urban ecosystems.
Why is this a problem?

Plastic pollution has become a major global environmental health dilemma in aquatic, coastal and marine ecosystems.

ENVIRONMENTAL
Loss of biodiversity, degradation of marine, coastal and terrestrial ecosystems and reduced water quality

HEALTH
Contaminated seafood and exposure to harmful chemicals from plastic degradation. Blockage of water-drainage system; stagnating waste-water as breeding ground for pathogens.

ECONOMICAL
Loss of tourism due to pollution and clean up cost, especially at coastal ecosystems. This is also a legal problem, if not yet, than certainly in the future.

ETHICAL
Do we really want to pollute our planet so that there is soon more plastic than fish in the oceans?
Do we want to live wasteful lifestyles?
Or do we wish to live in harmony between people and nature?
Do we really want whales, dolphins, turtles, birds to suffer disease and slow painful death from plastic pollution?
What type of UNESCO designated sites are there?

BR / WHS / GG

UNESCO’s World network of Biosphere Reserves consist of 714 BR in 129 countries. BRs foster the harmonious integration of people and nature based on socio-ecological sciences. BRs are learning places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention. They are places that provide local solutions to global challenges.

UNESCO World Natural Heritage Sites

Globally unique landscapes of international importance.

UNESCO Global Geoparks

UNESCO Global Geoparks are landscapes of international geological significance. They are managed with holistic concept of protection, education and sustainable development.

These sites are internationally recognized, nationally managed, based on a management plan that has been accepted by UNESCO’s external advisors, including biologists, ecologists, geologists, geographers, and environmental managers. The status can be withdrawn in case the management plan is not implemented.
Example: Ranong Biosphere Reserve

Mangrove ecosystems as well as hilly islands with natural forests and coconuts
What to do with the plastic trash?

Example: Ranong Biosphere Reserve
Example: Cat Ba Biosphere Reserve

Mangrove ecosystems as well as Kegel-Karst systems
Example: Cat Ba Biosphere Reserve

Daily landing of marine plastic clean up in Cat Ba, Viet Nam
Plastic pollution is a serious issue in the Arab States of the Gulf – in Khor Dubai not yet so much
A flamingo take-off in Khor Dubai
Example: Lake Tana Biosphere Reserve

Pelicans, hippos, eco-tourism, plastic is an issue, but not yet as pronounced as elsewhere
Example: Lake Tana Biosphere Reserve

One of the two remaining places where people still use Papyrus-tankwas
Mangroves at high tide (marine ecosystem)

Example: Planned BR Myeick Archipelago
What to do with the non-biodegradable trash?
Example: Satun Global Geopark

The Plastic Initiative
Every year 450,000,000 tons of plastic produced globally
The issues

More than 50 percent of this land-based plastic leakage is contributed by just 5 Asian countries; China, Indonesia, Thailand, Vietnam and the Philippines.

But: Many other countries are not much better.

Some countries have taken serious action. All of them should do it, develop national action plans and start redressing plastic pollution urgently and seriously.

UNESCO designated sites can play immensely important roles for testing and demonstrating best practices.
The issues

By 2050 12,000,000,000 tons of plastic in the world’s oceans. (1.2 tons per person)
An example on what can be done: Koh Chang, Thailand

Possibly the most difficult challenge: to make our cities and communities sustainable
An example on what can be done: Koh Chang, Thailand

Recycle all plastic into marketable re-usable products – generate knowledge and develop the skills
An example on what can be done: Koh Chang, Thailand

Keep the mangrove ecosystems intact
An example on what can be done: Koh Chang, Thailand

Keep the beaches clean
An example on what can be done: Koh Chang, Thailand

All of us people in the world have to attain knowledge and skills how to reduce plastic pollution and actively participate

Private sector & Foundations

Schools & Universities

UNESCO

Implementation

Inspire youth

Evaluate results

Disseminate best practice

Government & UN agencies

The Plastic Initiative
The main objectives

- National plastic-waste-management-action-plans
- Open Science online information hub https://quest4action.org/plastic/
- Engage all schools, all universities, all students. Support their grass-root-level-projects in UNESCO Biosphere Reserves, cities, rural areas, and elsewhere

**Clean-up campaigns are not enough!**
The SDGs of relevance for The Plastic Initiative

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

Photo credit: Justin Hofman
We have a plan and we need your help

Mangrove Forum

Plastic Initiative

Green Academies
https://quest4action.org/plastic/

Science and education is absolutely essential for solving the global plastic pollution.

Visit and utilize the UNESCO sites for your action and testing of ideas in an outdoor laboratory.
Conclusion

Enough taking – take action

Turn from being helpless to being smart, knowledgeable, and responsible

Study, test, apply, participate

The world’s ecosystems suffer from plastic pollution, macro-, micro-, nano-plastic.

How can we utilize the UN Decade for Ecosystem Restoration 2021 – 2030 for a serious restoration drive, and restore and repair the marine, coastal, terrestrial and aquatic ecosystems?

It needs the participation of all Government environment authorities, schools, universities, and the general public, supported by the private sector and foundation, and UN agencies. We are just at the beginning....