TOWARDS SUSTAINABLE & CLIMATE-SMART COMMUNITIES THROUGH ARTS & SOCIAL ENTREPRENEURSHIP

COMMUNITY CHALLENGERS

THE SUSTAINABILITY & CLIMATE ACTION HANDBOOK: BACKGROUND INFORMATION

Co-funded by the European Union

INTELLECTUAL OUTPUT 1.1

INTERNATIONALE AKADEMIE BERLIN für innovative Pädagogik, Psychologie und Ökonomie gGmbH (INA)
IYCE Institute for Youth and Community Empowerment
YEPP EUROPE
IDEJU MĀJA
supernatural
DYPALL DEVELOPING YOUTH PARTICIPATION AT LOCAL LEVEL
9 Out Of The Box INTERNATIONAL
HRVATSKO DRUŠTVO LIKOVNIH UMJETNIKA
YEPP ITALY

INTELLECTUAL OUTPUT 1.1

THIS HANDBOOK IS PUBLISHED AS THE FIRST PART OF THE INTELLECTUAL OUTPUT 1 OF THE PROJECT “COMMUNITY CHALLENGERS” WHICH IS FUNDED BY THE ERASMUS+ PROGRAMME OF THE EUROPEAN UNION.

THE HANDBOOK IS DESIGNED IN A YOUTH FRIENDLY LANGUAGE, FEATURING CARTOONS, ILLUSTRATIONS, INFOGRAPHICS AND VIDEOS. IT ACTS AS ILLUSTRATIVE STORYTELLING. PRACTICAL INFORMATION ON HOW TO CONDUCT WORKSHOPS FOR THE HERE LISTED TOPICS, ADDED WITH INFORMATION ON COMMUNICATION CHANNELS OR STUDY OPPORTUNITIES ARE LISTED IN THE SECOND PART “PRACTICAL INFORMATION:

IT IS AVAILABLE IN A PDF VERSION AND ONLINE VERSION WITH INTERACTIVE FEATURES WHERE USERS CAN LEAVE COMMENTS AND FEEDBACK.

THIS HANDBOOK IS AVAILABLE IN SIX LANGUAGES: ENGLISH, ITALIAN, PORTUGUESE, SERBIAN, CROATIAN AND LATVIAN.

TABLE OF CONTENTS

1.INTRODUCTION: CLIMATE ACTION AND “COMMUNITY CHALLENGERS”

Climate action and activism of young people for the cause of climate and environment protection has become a word of the mouth since the beginning of the global movement “Fridays for Future” in 2018. Whereas the world has moved from using the term climate change to climate emergency in the last few years, and more signs, such as rising sea level, forest fires and floods, are increasingly becoming obvious to all, it is the young people who are concerned about what kind of planet they would have to live on. This concern may take the shape of “eco anxiety” – worry about the future and feeling of helplessness over the potential consequences of climate change for those living now and even more so for those of later generations.
Climate action is a response to these developments and is one of the 17 Sustainable Development Goals (SDGs) that are goals of the Agenda 2030 of the United Nations. Chapter 5 of this Handbook further elaborates the Policy Level and the SDGs. The SDG number 13 pleads:

"TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS".

Education and information about the current situation for everyone, especially young people, joint reflection and finding tools and methods to express feelings as well as take action greatly helps to overcome the sense of struggling alone. It can give hope for the future and is part of the efforts to reduce climate-induced impacts.

The Community Challengers project seeks to empower young people with tools to take and reflect on climate action and mobilise their communities with innovative and appealing measures. It is developed by the Consortium of 7 partners from Belgium, Croatia, Germany, Italy, Latvia, Portugal and Serbia with complementary expertise in the field

of environmental education, youth empowerment, arts, advocacy and entrepreneurship. The project runs for two years (01/2021-12/2022) and is funded by the Erasmus+ Programme field of Youth.
The project is based on a learning model that combines education, arts and social entrepreneurship, and thus targets both the intellectual and emotional levels. The learning model of the project consists of 4 steps: Learn, Analyse, Create, Advocate (LACA). This method enables young people to learn about climate change; analyse their community from the point of view of sustainability; create a vision for the future, combined with entrepreneurship tools, and advocate for change. Four steps of the model correspond to four so-called Intellectual Outputs of the project. These are results and outputs produced by the project partners, bringing compact knowledge about key facts and figures in the environmental field. It is available in diverse formats: as a Handbook, mapping toolkit, instruction & inspiration for arts creation, and video tutorials. Every format is connected to one step of the learning model:

1. Learn – Climate Action & Sustainability Handbook (O1)
2. Analyse – Community Mapping Toolkit (O2)
3. Create – Community Challengers Guide (O3)
4. Advocate – Advocacy Tutorials (O4).

These outputs are developed and tested by all project partners in their respective countries. Young people and youth workers are the project's main target group and will accompany the testing, attend workshops and give their feedback so that the outputs are fine-tuned and validated.

ABOUT THE HANDBOOK

The Climate Action & Sustainability Handbook is the first Intellectual Output of the project and the first step "LEARN" of the above described 4-step LACA model.

It is split into two parts:

1st part: IO1.1: The Handbook: Background information and basic knowledge on climate-related issues

2nd part: IO1.2: The Handbook: Practical tips and experiences: workshop formats, tips by trainers

The objective of this 1st part, the Handbook on background information, is to inform young people and the wider public about key environmental issues, their causes and effects in the ecosystem.

The 2nd part on practical tips shows solutions through best practice examples and creates awareness that everybody can be and needs to be part of the solution.
This combination of theory and practical exercises is meant to give youth workers and educators necessary non-formal learning & teaching tools to deliver engaging, participatory and practice-oriented workshops, including exercises and tasks that provoke further reflection or inspire action.

Understanding key environmental and climate change issues and being able to understand and link the developments between the individual (micro) and community, national and global level (macro) is the expected outcome of this book. Young people and every reader shall become aware of key international initiatives and goals, such as the SDGs, European Youth Goals and the European Green Deal.

It shall support the discovery of actions and initiatives that can be taken to become active and tackle climate related challenges, problems and crises. Ultimately, the goals is that everyone is aware of their potential to act as an individual, as a consumer, as a part of a group or community, and thus act for change.

2. NEEDS SURVEY OF YOUNG PEOPLE

This survey was conducted from February to April 2021 by YEPP EUROPE. Under the title “Climate Action Now” all project partners called for young persons and youth workers asking for their opinion and thoughts about climate change and climate action through a survey. Almost 400 people responded to the call. The following gives an overview of the main survey results, the respondent’s profiles and the main targeted areas.
The results formed the ground of the chosen topics, practical examples and highlighted practical advices of this handbook (chapter 3-5).

Respondent Profile
Total of 365 responses, mostly from: Latvia, Portugal, Italy, Croatia, Serbia, and Belgium.
Other represented countries: Albania, Montenegro, Turkey, France, Greece, Bosnia & Herzegovina, the United Kingdom, Azerbaijan, Brazil, and the USA.
Most prominent age groups: 20 - 24 year olds (23%), 25 - 29 year olds (17%).
53% of respondents were students and 68% of all respondents identified as female.

Level of knowledge and concern regarding climate change
Majority of the respondents have basic – medium knowledge about key environmental issues. When asked about their level of knowledge regarding these issues, 74% gave ratings between 5 - 8 (on a 10-point scale).
Similarly, the majority of the respondents are highly concerned about climate change. 82% gave ratings between 7 - 10.

AWARENESS OF KEY ENVIRONMENTAL ISSUES

Key environmental issues that the respondents were most aware of: pollution (86%), global warming and climate change (82%), industrial and household waste (75%), and deforestation (73%). Issues of least awareness were acid rain (36%) and urban sprawl (22%).
Respondents reported a strong desire to learn more about the loss of biodiversity (51%) and urban sprawl (50%).

AWARENESS OF ENVIRONMENTAL INITIATIVES

Among international environmental initiatives, the Paris Agreement (60%) and the UN Sustainable Development Goals (46%) were most recognised. The knowledge of the main strategic European documents on climate issues European Green Deal (44%), and the Green New Deal (23%) was rather limited.
When asked to rank their optimism regarding reaching the goals of the Paris agreement, 28% of the respondents gave scores of 5, expressing very cautious optimism. Higher rankings (scores of 8 – 10) received the lowest scores.

THE ROLE OF INDIVIDUALS

Respondents show a good degree of confidence in the role of individual citizens in reducing the effects of climate change. 94% agree that young people have a particular role to play in this. However, there remains a strong need for intergenerational and interdisciplinary cooperation. When asked about the significance of their individual roles in reducing the effects of climate change, a high percentage (85%) rated their roles in the upper scale with scores between 5 - 10. Moreover, (98%) were willing to change their habits to help the environment.

PROMOTING ACTION AT THE LOCAL AND COMMUNITY LEVEL

Most of the respondents identified the effects of climate change on their community, such as extreme weather patterns, water contamination, deforestation, and pollution. When asked how they could promote climate action on the local level, cultural, practical, and political layers were outlined. Starting with personal education and habit change, they could then engage in advocacy by informing others. Suggestions were involving the local community and the youth, engaging their networks, utilising social media, and engaging in discussions with government stakeholders.

IN AN OPEN QUESTION, YOUNG RESPONDENTS SHARED THEIR IDEAS ON WHAT SPECIFIC QUESTIONS AND TOPICS REGARDING THE ENVIRONMENT AND CLIMATE CHANGE NEED TO BE COVERED IN THIS HANDBOOK.
THESE ARE THE ANSWERS:

KNOWLEDGE

- Factual answers to the most known false facts about climate change.
- How climate change impacts our community directly.
- Link between individual actions and climate change.
- Impact of corporations and big industries.
- The consequences of not achieving the 2020 and 2050 goals.

CALL FOR ACTION

- How to change individual habits towards green lifestyle (different ways an individual could help battle climate change), e.g. zero waste, recycling, water usage, second hand clothing; solutions for different budgets.
- Small daily actions (show simple and practical solutions that can help the environment in our daily life).
- Practical guidance and examples linked to young people's local reality and daily-life from schools, neighbourhood, bars venues, beaches and forests they know.
- How to get involved in advocacy.
- Where to study environmental science in the EU, what organisations work in the field.

WHAT WOULD YOU LIKE TO GAIN FROM A PROJECT LIKE THAT?

KNOWLEDGE

- More knowledge to speak louder about this problem.
- Practical advice for daily life.
- Scientific, political, economic, social, ethical and cultural perspectives on climate change.
- General reflections on climate change in all sectors of society and education, make climate change being seen as a priority by the big powers in the world.
- More awareness of the environmental world situation and on the actions undertaken by governments and enterprises in order to tackle the problems.

CALL FOR ACTION

- A possibility to take action and make a change in my daily life to have a real impact on climate change.
- A Facebook group in which you post stuff like " Spring cleaning in come and join, free tea for everyone".
- A guide for daily actions to always have handy.
- Actions that can be done immediately and what can be done gradually in terms of harm reduction and habit change.

3.KEY ENVIRONMENTAL ISSUES

If we look around the world and the diversity of life, it becomes very clear that the earth is a well organized system. This system is influencing our lives in a strong way. It creates our clean water, our raw materials, our food, our clean air. Humans are an integral part of this complex super organism, that we call Earth and the wellbeing of Earth.

The perfect life system that has been in the making for billions of years, humans have degraded in less than 200. The environment has been degraded, and the balance between humans and other living organisms is disrupted. Environmental degradation and the way of life of the global society, policies and the way businesses are conducted, causes air pollution, poisoning of food and water, extinction of species and health hazards for local communities across the globe.

This is why the solution to the current global environmental crisis lies in the joint effort of individuals and communities working together with policy makers and business companies. Each individual, enterprise and institution is asked to rethink its way of finding decisions and gaining capital, including the wellbeing of the people and the plant. Hence, everyone can work together to implement impact projects that are beneficial for the economy but also benefit the environment and the communities.

3.1 LAYERS OF THE EARTH

The environment of the earth can be divided into two segments: natural and man-made.
The natural environment consists of the Geosphere (inner earth), Biosphere (area occupied by all life), Atmosphere (area occupied by air), Lithosphere (area occupied by solid materials) and Hydrosphere (area occupied by water). Basically the environment consists of rocks, minerals, magma, plants, animals, birds, microorganisms, light, air, land, water and humans.
The man-made environment consists of elements that are modified and created by humans, such as cities, buildings, factories, roads, cars, and industrial products. It is important to note that all man-made environments also derive from nature, yet it is modified to suit the needs of humans.

GEOSPHERE

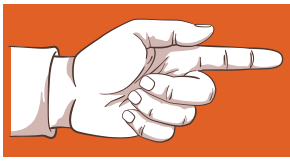
Geosphere is the interior of the earth that goes from the surface to the inner core of the earth. The thickness of the inner earth is approximately 6,700 km. The geosphere consists of rocks, minerals, magma, and sand. The inner earth is divided into three layers: the crust (lithosphere), the mantle, and the core. The crust (continents and the bottom of the ocean) is the thinnest part of the geosphere going from 5-30 km in thickness. The crust is divided into tectonic plates. The next layer of the earth is the mantle. It makes up 80% of the earth's volume and 2,900 km in thickness. The mantle is very hot ranging from 700-1300 degrees celsius.

DO YOU KNOW WHAT THE MANTLE IS MADE FROM?

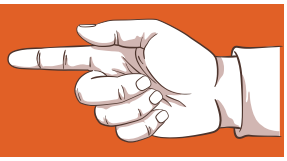
The mantle is made from magma (melting rocks). Magma sometimes gets out of the inner earth, through volcanoes. The core is the innermost layer of the earth and is 3,500 km thick. The core is mostly made up of iron. This is where earth is really hot with temperatures going from 4,000 to 6,000 degrees Celsius. The inner core movement, differences in temperatures and pressures create electromagnetic fields.

BIOSPHERE

The Biosphere is a global ecological system that integrates all living organisms and their relationships, on the land, above and below. The Biosphere goes from depths of the oceans to about 10 km above sea level. It is impacted by the Sun, the weather and the climate, and even by the smallest organisms such as worms, who decompose the organic matter.



DID YOU KNOW?



WORMS, ALTHOUGH SMALL, PLAY A HUGE ROLE ON THE PLANET. THEY BREAK DOWN ORGANIC MATTER, LIKE LEAVES AND GRASS INTO ELEMENTS THAT PLANTS CAN USE. WHEN THEY EAT, THEY LEAVE BEHIND CASTINGS THAT ARE A VERY VALUABLE TYPE OF FERTILIZER.

ATMOSPHERE

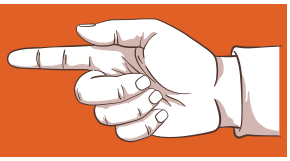
Atmosphere is the outer layer that surrounds the earth. The atmosphere of Earth is made up of gases: nitrogen (78%), oxygen (21%), argon (about 0.9%) and carbon dioxide (0.04%). Oxygen is used by most living organisms for breathing. Carbon dioxide is

used by plants and algae for photosynthesis. The Atmosphere can also be divided into several other layers: Exosphere, Thermosphere, Mesosphere, Stratosphere, Troposphere.

HYDROSPHERE

All of the water on Earth, all of the water in liquid, solid or gas state is called the hydrosphere. The oceans, the seas, the rivers and the lakes, all of the glaciers, ice caps and snow, all underwater, make up the incredible water system of the earth. The water is found in the air, on the surface and in the underground. 75% of the planet's surface is covered in water, where all the fish, whales and dolphins live, as well as crabs, jellyfish and other mysterious and funny creatures.

DID YOU KNOW?



ONLY 1% OF ALL WATER ON EARTH IS DRINKABLE! THIS IS WHY WATER IS SO PRECIOUS AND SHOULD BE TAKEN CARE OF.

LITHOSPHERE

Lithosphere presents the solid layer of the earth. It is the top layer of the earth that is made up of the tectonic plates. It is believed that once upon a time, all earth was one big continent, one big solid landmass known as Pangea, that over time broke down into several continents, as they are known today.

PANGEA

The earth's plates are divided into Pacific plate, North-American plate, Euro-Asian plate, African plate, Arctic plate, Indo-Australian plate, South-American plate. This is where all the earthquakes appear, due to the movement and interaction of the tectonic plates.

3.2 THE ECOSYSTEM

A life community in nature needs space for a life in which members of the community can satisfy their needs: to move, take food, breathe, find shelter etc.
There are various different ecosystems on the planet. They can vary, e.g. being big like the Sahara Desert, or small like the Black sea. Flora and fauna are an important part of the ecosystem, and because of the great numbers of animals and plants on the planet, the ecosystem has many varieties.
The ecosystem is divided into two elements:

1. The **biotope**: the physical surrounding of the ecosystem, such as water, soil, air, wind, light and temperature.

2. The biological community that lives in the ecosystem, known as **biocenosis**. These include plants, animals, and microorganisms.

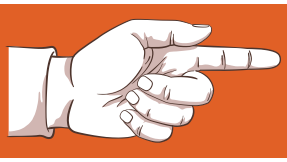
Ecosystems are very carefully designed, in a fine relationship between the resources of each system and the living organisms. Life is very well balanced and the living world is very well adapted: any disruption to the ecosystem can cause serious effects on all the elements.

All ecosystems can be divided into two major categories: **Earth** (terrestrial) ecosystems and **Water** (marine) ecosystems.

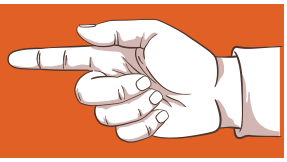
The terrestrial ecosystems include jungles, forests, deserts, taigas, tundra, savannas and grasslands. The marine ecosystem includes freshwater rivers and lakes, salt water oceans and seas. There are also human made ecosystems which include systems like cities.

3.3 BIODIVERSITY

Biodiversity is the biological diversity of all living things on the planet earth. It refers to all genes: genetic diversity, all species: diversity of species, and ecosystem diversity: the diversity of ecosystems.
Genetic diversity is a sum of all genes of all living beings on our planet, because every organism on earth has a unique combination of genes. Diversity of habitats, biogenesis and all the processes and functions of the organisms inside the ecosystem are referred to as ecosystems' diversity.



DID YOU KNOW?



ALL LIVING ON THE PLANET REPRESENTS THE TREMENDOUS DIVERSITY OF SPECIES. MORE THAN 80.000.000 SPECIES LIVE ON THE PLANET. TO THIS DAY „ONLY" 1.7 MILLION SPECIES HAVE BEEN IDENTIFIED.

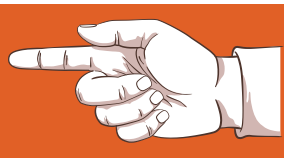
Looking through the eyes of a kid, biodiversity is a bear and a bird, a strawberry and banana, a flower and a bee. Through the eyes of a village man or woman, biodiversity is a grass plain, a sheep, a bull, fruit trees and forests.

THROUGH THE EYES OF AN ACTIVIST, BIODIVERSITY IS A VALUE WORTH PROTECTING.

Imagine you go out on the street and all the people look the same! They had the same eyes and hair, the same nose, the same height, and they all spoke in the same manner? Imagine you went

to the forest, and all the trees were the same! Same color, same species, same height. Imagine instead of all the fruits and vegetables that are out there, we only had pears and carrots? Imagine there was only one bird in nature? Biodiversity is variety. Scientists have identified nearly 2 million species on the planet. These include mammals, birds, fish, plants and birds.
The planet and its biodiversity function in harmony. Diversity of forests provide food for other species, variety of trees and their root system, keep the water intact and protect from flooding. Everything in nature is designed in such a way that it has a purpose and it supports itself in many different ways. The flowers give nectar and pollen for the bees, and the bees pollinate the plants. Pollination is one of the most important aspects of biodiversity, as it is directly responsible for the food chain. No pollinators, no pollination, no plant reproduction, no food! That is why every aspect of this harmony is important. Disruption of this harmony can lead to loss of habitats and loss of biodiversity.

DID YOU KNOW?



BEES POLLINATE OVER 130 AGRICULTURAL CROPS INCLUDING FRUIT, LEGUMES, NUTS, AND VEGETABLE CROPS. POLLINATION BY BEES BOOSTS AGRICULTURAL OUTPUT AND QUALITY BY AROUND 14 BILLION DOLLARS EACH YEAR.

Land productivity depends on variety as well. All species have their role in running the system smoothly. Many agricultural companies these days plant a single species of plant (like soy, pumpkin, corn, etc.) on huge expanses of land, which is called monoculture. Monoculture, compared to biodiversity in agriculture, makes plants less resistant to disease. Variety of plants gives us many options for our medicine.

3.4 ECOLOGY

Ecology is the science of the environment. The name comes from the Greek words oikos (home) and logos (science). The term ecology was first used by the German biologist Ernest Haeckel in 1866. This multidisciplinary science refers to many other scientific disciplines.

LET'S BE CLEAR:
YOU HEAR AND READ 'BIO'?

BIO IS THE ABBREVIATION FOR BIOLOGICAL AND IS RELATING TO BIOLOGY, TO LIFE OR TO LIVING PROCESSES.

The term ecology is often used as a synonym for environmental protection, however environmental protection is only one of the areas of ecology.

LET'S BE CLEAR:
YOU HEAR OR READ 'ECO'?

ECO IS THE ABBREVIATION FOR ECOLOGICAL WHICH MEANS ANYTHING "RELATING TO THE ENVIRONMENTS OF LIVING THINGS OR TO THE RELATIONSHIPS BETWEEN LIVING THINGS AND THEIR ENVIRONMENTS*".

* https://www.merriam-webster.com/dictionary/ecological

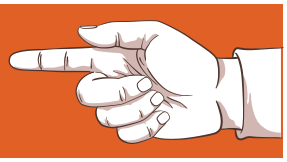
In essence, ecology is a scientific discipline that studies the relationships between living organisms, and the biological interactions between the organisms and their environment. Ecology seeks to understand the connections between plants and animals and the world around them: it provides information about the benefits of ecosystems and how we can use the resources without harming the planet.

This beautiful superorganism, with gorgeous colors, tastes and sounds, brimming with life is called **Earth**. Earth is home for all living beings, and it provides clean air to breathe, clean water to drink, healthy food to eat, medicine, and a place to live in. The harmony of humans and nature has been in balance for many years, but something went wrong.

3.5 LINEAR ECONOMY

“Buy, use, trash”, are the three simple words that could describe the essence of the current economic system.
The current economic model of most countries and companies involves using the planet's resources to produce as many products as possible, most of which will end up in a landfill – wasted. This concept of exploitation of resources that end up as waste is called ‘linear economy’. This system is not sustainable and has a negative effect on the health of people and the planet.

DID YOU KNOW?



21 BILLION TONS OF MATERIAL USED IN PRODUCTION ARE NOT PART OF A FINAL PRODUCT AND END UP IN LANDFILL. 99% OF THINGS WE BUY END UP IN A LANDFILL- IN 6 MONTHS. WE THROW AWAY 50 MILLION TONS OF ELECTRONIC WASTE AND EVEN CREATE ‘E-WASTE’ WHILE LEAVING EMAIL UNREAD, STORING TONS OF UNUSED DATA ON SERVERS.
¾ OF TEXTILES WE USE ARE DUMPED IN LANDFILLS. WE ARE CURRENTLY SPENDING 1.5 PLANETS PER YEAR TO SUPPORT THE CURRENT NEEDS OF HUMANITY (WWF-2012). BY REDUCING WASTE, THE EU COULD SAVE UP TO $600 BILLION IN MATERIAL PER YEAR.

Excessive deforestation, excessive mono-agriculture, land degradation, overuse of chemicals and the use of dirty energy sources pollutes nature, and has a negative impact on our health.

3.6 HISTORICAL LOOK BACK: THE INDUSTRIAL REVOLUTION

Industrial revolution refers to the sudden development of the human civilisation that happened in a short period of time. In the second half of the 18th century, manual power was replaced with a new source of power: the coal and the steam machine. Development of humankind from the end of the 18th century up until the mid-19th century took a quantum leap and brought about many changes in the political, economic and social systems of the time. The Industrial revolution started in Great Britain and quickly spread to Western Europe and North America.

The Industrial Revolution (IR), is associated with new production processes, where manual labor was replaced by power of steam and use of new mechanical, chemical tools and technologies for production and development.

The essence of IR is the use of coal for power, rather than using manual work, wood and other biofuels. The key sectors of the IR were iron founding, steam power, oil drilling, using railroads and steamboats for logistics and transport, all of which increased worker productivity and reduced time spent on travel, transportation and communications. Textile industry was the dominant industry at the time in terms of number of employees, values of the goods and the capital. It was this industry that started using new technological methods for production the most. The textile industry started using new fiber spinning technology for wool, cotton and other fibers, and it used the steam (coal burning) to power the production. Various new chemicals were used to color the fibers.

New technologies made it possible to work faster, and to produce more goods. However, this could be the root of environmental problems that arrived in the 20th century. The air was being polluted by coal burning, and the rivers started to be polluted from the wastewaters created by the chemicals used in textile coloring.

80% of the population lived in the villages and worked manually in the agriculture production. IR had a big impact on village life and brought many changes through technology that started to be used for food production. Food production increased and it marked the beginning of the agricultural revolution. This phenomenon brought about the increase of big private landowners, and the villagers could not sustain their life the way they did before. Some villagers started working for the new big land owners, and others moved to the cities to look for work in factories.

The Industrial Revolution brought many innovations in the way the people lived and worked. It has brought many benefits for society, the fast and massive production, the use of coal and chemicals in the production process, the movement of the people from villages to towns, the changes in food production. But all of them had a massive impact on the environment.

Until this day, the economic system has not changed. Use of fossil fuels and chemicals, massive resource exploitation, and ultimately creation of waste, are associated with the economic system that we refer to as linear economy.

4. PRESENT-DAY ENVIRONMENTAL ISSUES AND PRACTICAL TRAININGS

The following issues are the most pressing issues of today on the people and the planet: deforestation, loss of biodiversity, depletion of the ozone layer, acid rain, climate change and global warming, pollution, industrial and household waste, urban sprawl, and overconsumption. Each chapter contains an infographic and provides further information on the topic. At the end of each chapter, there is a reference to Training and Learning Sessions. These sessions are presented and explained in IO1.2 The Practical Handbook and is addressing European Youth Workers and Trainers.

4.1 DEFORESTATION

Our forests are disappearing at a rate that is extremely destructive for the environment and the ecosystem. Ever shrinking forests have serious repercussions for the fight against climate change.

FACTS

1.3 million square miles of forest was lost between 1990 and 2016.[1]

17% of the Amazon rainforest has been destroyed over the past 50 years.[1]

30 soccer fields' worth of forest were lost every minute in 2019.[4]

66% global forest cover loss is occuring mainly in the tropics and sub-tropics, subsequently destroying the important ecosystem services forests provide.[5]

CAUSES

The most common causes of deforestation and forest degradation are agriculture, unsustainable forest management, mining, infrastructure projects and increased fire incidence and intensity.[6]

EFFECTS

Soil is more prone to erosion, causing the remaining forest to become more vulnerable to landslides and fires.[7]

80% of land-based species live in forests. Forests are also home to a great number of plant species. Deforestation results in a loss of habitat and can drive many species into extinction.[4,7]

We are all affected. However, **250 million**, those who are living in forest and savannah areas, are directly affected. Moreover, all people people rely on the forest for their food, shelter, and livelihood.[4,1]

Since trees protect against pollution by filtering harmful chemicals from air and water sources (rivers, lakes, etc., deforestation threatens both the health of the ecosystem and the world's population.[3]

33% of global emissions are absorbed by trees each year. The carbon dioxide released into the atmosphere, including heat trapping gases resulting from human activity, is absorbed by trees. Deforestation therefore accelerates global warming.[1, 3]

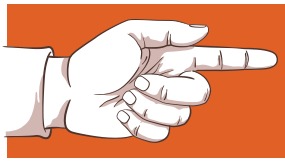
ACTION

Conservations still have many reasons for hope. A lot of global organisations are shifting to more sustainable and eco-friendly processes. Although big companies can make the most impact on eliminating irresponsible and unsustainable deforestation, as consumers, we still have a big role to play. Making informed consumption choices, reducing single plastic usage, and educating our friends and family are great ways to start.[8]

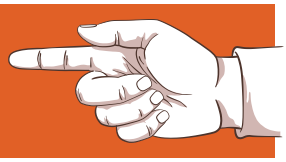
According to the World Wildlife Fund, 30% of the Earth's land surface is covered in forests. These forested areas can provide food, medicine and fuel for more than a billion people. Worldwide, forests provide 15 million people with jobs in the forest sector, and more than 40 million people have jobs related to forests*.

Forests do not only provide for the people, they play the main role in the function of the biosphere of the planet. They produce oxygen vital for all of life, they use and store CO2, they hold the land together to prevent erosions and capture water. Trees are home to birds and millions of other species and living creatures. They regulate the climate and lower the temperatures. For example, the difference in temperatures in the cities with trees is significantly lower than the cities without trees. Trees are a super biological machine, without which no life can be sustained on our planet.

Wood is not only used for furniture, paper production and other timber products. Forests are permanently destroyed to make room for massive land areas that are used for agriculture, like for feeding the animals used for meat production, and urban development, e.g. for the construction of roads. Deforestation is taking place all over the globe but most concentrated deforestation occurs in tropical rainforests.



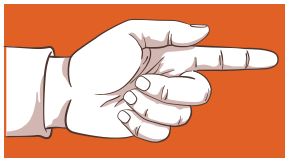
DID YOU KNOW?



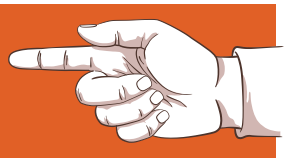
EVERY YEAR A FOREST AREA THE SIZE OF IRELAND IS DESTROYED (70,000 SQUARE KILOMETRES).

We now know that forests provide life for the people and the planet: they produce oxygen vital for all of life, they use and store CO2, they hold the land together to prevent erosions, they capture water. Trees are home to millions of species, they regulate the climate.

* https://www.worldwildlife.org/threats/deforestation-and-forest-degradation



DID YOU KNOW?



A MATURE OAK TREE CAN ABSORB UP TO 1,200 LITERS OF WATER PER DAY. A SINGLE TREE CAN ABSORB MORE THAN 5KG OF CO2 PER YEAR. ONE TREE PRODUCES THE SAME COOLING EFFECT AS 10 AIR CONDITIONING UNITS.

Yet, forests are permanently destroyed to make room for massive land areas that are used for agriculture. Deforestation not only occurs by cutting, it is also being done by burning to make room for cattle grazing; a process lead by the meat industry. The impact of the meat industry is colossal, and numbers are still increasing.

WHAT CAN YOU DO?

Reducing your meat consumption can put pressure on the industry and force them to switch to more sustainable practices. The strong negative impact of meat consumption on health, especially the heart, is well known, and can be used as a further incentive to turn to (partial) vegetarianism or veganism.

You want to know more? The World Health Organisation published a Question & Answer section on 'Cancer: Carcinogenicity of the consumption of red meat and processed meat', highlighting answers on what processed meat is, which risks are run and which effects consumption can have*. In addition, if you're curious to learn about the catastrophic environmental effects of the meat and dairy industry on our planet, check out Jonathan Safran Foer's book We Are The Weather from 2019.

According to NASA, if the current level of deforestation remains unchanged, the entire world's rainforests would be wiped out in

* Cancer: Carcinogenicity of the consumption of red meat and processed meat (who.int)

100 years. That is why deforestation is considered to be one of the main drivers of CO2 increases in the atmosphere. Forests capture and store CO2 for food, while burning forests releases massive amounts of CO2 into the air. Moreover, the loss of biodiversity is directly impacted by deforestation. To reverse the trend of loss of habitats, forests and trees, we need to get active.

AND THERE ARE SEVERAL WAYS TO GO ABOUT FOREST PROTECTION. FOR EXAMPLE, WE CAN PLANT MORE TREES. PLANTING TREES IS PARTICULARLY IMPORTANT IN CITIES. URBAN SPRAWL, OVERDEVELOPMENT, CONSTRUCTION INDUSTRY ARE ALL CAUSES OF DEFORESTATION OF THE CITIES!

SUSTAINABILITY

When it comes to the economy, the production of paper, furniture and other timber products need to be produced in a sustainable way. This simply means: a company using wood for production needs to plant the same amount of trees to offset the damage. There are brands that use certification, such as the Rain Forest Alliance*. Rainforest alliance certification uses a little frog symbol, a symbol of environmental, social, and economic sustainability and can be found on farm and forest products around the world. This seal promotes collective action for people and nature. It amplifies and reinforces the beneficial impacts of responsible choices, from farms and forests all the way to the supermarket check-out. The seal is an example to recognize and choose products that contribute toward a better future for people and the planet.
That is why it is important that every citizen buys wisely and responsibly. Each choice of buying a product can also be a choice for sustainability, the circular economy and can impact that companies are working responsibly.

LEARNING AND TRAINING ACTIVITIES ARE:

THE TRUTH OF THE MAP (PAGE 6, I01.2)
THE SOUNDS OF THE FOREST (PAGE 7, I01.2)

* https://www.rainforest-alliance.org/

4.2 DEPLETION OF THE OZONE LAYER

Ozone is gas made from three oxygen atoms (O3). Ozone in the stratosphere is formed naturally through the interaction of solar ultraviolet (UV) radiation with molecular oxygen (O2). The ozone layer is approximately 15-30 km above the Earth's surface and prevents most harmful wavelengths of ultraviolet (UV) light from passing through the Earth's atmosphere.
Although in 2019, NASA reported that the Ozone layer has been the smallest ever recorded layer, due to weather patterns, it is important to understand that the layer can be damaged due to pollution and ozone-depleting chemicals. The main chemical CFC (chlorin, carbon, fluorine) is the cause of ozone depletion. When chlorine meets the ozone, it rips it apart, and this is how the ozone is depleted. The ozone layer can be damaged due to pollution and ozone-depleting chemicals.
In 1989, the Montreal protocol banned the production of ozone depleting chemicals. Since then, the amount of chlorine in the stratosphere has been reduced, and the ozone hole has been shrinking.

DID YOU KNOW?

OZONE DEPLETING CHEMICALS CAN BE FOUND IN REFRIGERATORS, CLEANING AGENTS, SPRAYS, PESTICIDES, AIR CONDITIONERS, CAR EMISSIONS.

WE AS ACTIVISTS NEED TO BE AWARE THAT THERE ARE PRODUCTS THAT CONTAIN THESE CHEMICALS, AND WE HAVE TO MAKE SURE TO AVOID THE PRODUCTS THAT CONTAIN THEM. USING OUR CARS LESS, AND WALKING AND BIKING MORE CAN DECREASE THE AMOUNT OF POLLUTION. WE HAVE TO BE EDUCATED SHOPPERS, AND AVOID CLEANING AND SELF-CARE PRODUCTS THAT MIGHT CONTAIN THESE CHEMICALS. BUYING LOCAL STAFF, INSTEAD THE ONES THAT HAVE TRAVELED THE GLOBE TO REACH US IS NOW BECOMING COMMON SENSE.

LEARNING AND TRAINING ACTIVITIES ARE:

SEE HOW THICK (PAGE 9, 101.2)
RECORD IT OUT (PAGE 11, 101.2)

4.3 OVERPOPULATION

According to scientists, overpopulation occurs when a species' population exceeds the carrying capacity of its ecological niche*. Right now, the number of the existing human population exceeds the actual carrying capacity of Earth. The effects of it are unsustainable depletion of natural resources to have access to food, degradation of environment with the overuse of coal, oil, and natural gas, the destruction of natural habitats, such as forests, and water shortage, as well as wars, conflicts, rising unemployment rate and higher living costs. In the long run, it can lead to increased pandemics, malnutrition and lower life expectancy.

* https://www.conserve-energy-future.com/causes-effects-solutions-of-overpopulation.php

Growing advances in technology and science have affected humanity in many ways. While it is assumed that the global human population is not increasing exponentially, but predicted to stabilize at around 11 billion people by 2100, it is also proven that fossil fuel companies have contributed to one-third of all modern C02-emissions*.
On the other hand, human medical science has developed tremendously in the last centuries. This results also in the ability to save lives, reduce mortality, increase the fertility rate and create a better medical treatment for all. A direct result of this has been the increased lifespan and the growth of the population. Hence, it is the global environmental level and individual level that are in responsibility.

WHAT CAN WE DO? THE SOLUTIONS TO OVERPOPULATION ARE BETTER EDUCATION ON ENVIRONMENTAL IMPACT OF COMPANIES, HUMAN ACTIONS, JOINT ENVIRONMENTAL RESPONSIBILITY AND ITS IMPACT ON THE HEALTH OF HUMANS AND LIVING SPECIES.

LEARNING AND TRAINING ACTIVITIES ARE:

THE TRAFFIC THAT CLOGS THE ROAD (PAGE 14, I01.2)
THANOS' ETHICS (PAGE 16, I01.2)

* https://theecologist.org/2020/apr/16/debunking-overpopulation

4.4 OVERCONSUMPTION

Global consumption and production heavily relies on the use of natural resources. However, our consumption and production habits have grown to be destructive to the planet, leading to environmental deterioration and resource depletion.[1,2]

FACTS

We are currently consuming an equivalent of

1.5 planets

to maintain the resources we use every year.[3]

1.3 billion

tons of food, or one third of the food produced globally per year, ends up in the bin due to poor harvesting or transporation practices.[1]

80% of the world's natural resources are only used by 20% of the world's population.[4]

Overconsumption is directly linked to the current economic system that promotes consumerism in order to drive growth.

CAUSES

In recent years, some industries have strongly contributed to overconsumption by producing more than necessary. These include fashion, agriculture, manufacturing, and automobile.[4]

Consumption of wealthy households is also a significant contributer to human impact on the environment.[5]

EFFECTS

Our planet suffers from the increasing rate of our overconsumption. Forest, water, mineral, animal, and soil resources are over extracted, resulting in the deterioration of the Earth.[6]

Unsustainable practices lead to the collapse and degredation of ecosystems, habitats, and species.[6]

Overconsumption creates more waste and toxins, polluting our air, land, and water.[6]

As a significant amount of resources are utilised by the global North, most of the world's resources are utilised by only a minority of the world population. These resources are exploited to produce goods and services for the global North instead of being used to provide for the basic needs of the global South.[6]

ACTION

Lifestyle changes and sustainable choices, partnered with a renewed perception of wealth, can help combat consumerism.[5]

Sustainable design, or creating products and systems that are inherently ecological, is a big step towards a circular economy.[5]

Government policies, such as eco-taxes and greater investment in sustainable projects are effective in building, a greener, less consumerist, economy.[5]

Overconsumption can be described as “using more resources than we need”. It refers to a concept where the use of a natural resource has exceeded the capacity of a system.
Therefore, overconsumption is directly linked to the linear economic system, which is designed in such a way that we buy, use and throw away the goods, as opposed to a circular economical model, where we would reuse the goods, and produce them in a more sustainable way.
More people are demanding higher qualities and standard of living, which consequently affects higher extraction of resources and is directly linked to environmental degradation. The demand of the inhabitants for goods and services range from food, clothing, housing, to energy, technology, and transportation. If resources that are needed to produce these goods and services reach beyond a reasonable level, it can be considered as “overconsumption”.

DID YOU KNOW?

ACCORDING TO WWF, THE WHOLE PLANET IS BEING USED 1.5-WISE YEARLY, AND RESOURCES ARE BEING DEPLETED FASTER THAN THEY CAN RECOVER. RESOURCES IN GLOBAL NORTH COUNTRIES ARE CONSUMED 30 TIMES HIGHER THAN IN GLOBAL SOUTH COUNTRIES. AND ALSO DEVELOPING COUNTRIES ARE INCREASING THEIR CONSUMPTION RATE AND PURCHASING POWER.

The main effect of overconsumption is the inability of the planet to restore the resources as quickly as the demand occurs. For example, if there is more demand for paper, or furniture, trees will have to be cut to sustain the needs of humans and this will affect biodiversity loss.

In 2020, a team of scientists published a study, underlining that overconsumption is the biggest threat to sustainability. Overconsumption is directly linked to the current economic system that promotes consumerism in order to drive growth and the people buying and consuming these goods. A new economic model needs to be set up, and consuming habits need to change.

CIRCULAR ECONOMY

Circular economy can be the answer. In the new economic paradigm products need to be produced with higher quality in order to last longer. Remember your grandmother's washing machine? It probably lasts for 40 years and it is still working. Today the technology is being upgraded very often, we are pushed into buying new products.

AN EXAMPLE:

Imagine a building with 25 flats. This is 25 washing machines, 25 irons, 25 dishwashers. What if we could share these appliances? Sharing economy is gaining momentum. People are sharing cars to move around, people are swapping goods, second hand textiles can be as good as new.

Changing our eating habits can have an impact, too. We could ask ourselves if we need to consume 50-100 kg of meat every year. Or if we are aware of the health impact of overconsumption of meat? On the other hand, exported global products can have a huge negative impact on the ecology as goods need to be grown, produced and transported. Mass-consumption has a negative impact, regardless the product. So, every citizen should rethink her or his eating and consuming habits. This will bring change.

LEARNING AND TRAINING ACTIVITIES ARE:

I BUY, I EAT, I CONSUME, I POLLUTE (PAGE 18, IO1.2)

CREATE, NOT CONSUME (PAGE 20, IO1.2)

4.5 ACID RAIN

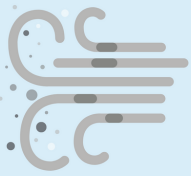
ACID RAIN

Acid rain, or acid deposition, is any form of precipitation containing high levels of nitric and sulfuric acids. This can include rain, snow, fog, hail, or dust. Acid rain causes negative disruptions in ecologogical systems and hazards to human health.

FACTS

4.2 - 4.4 is the pH level of acid rain. Normal rain has a pH level of around 5.6.[1]

Winds can carry pollutants far from their original sources, making acid rain a transboundary and international concern.[4]



When fossil fuels are burned, sulfur dioxide and nitrogen oxides are released into the atmosphere. These react with other elements and form acidic compounds that spread through the air, enter water systems, and sink into the soil.[3]

66% of sulfur dioxide and **25%** of nitrogen oxide found in the atmosphere come from electric power generators.[7]

CAUSES

Acid rain can result from natural causes, such as volcanic eruptions and rotting vegetation. However, most acid rain is a product of human activities, such as coal-burning power plants, factories, automobiles, and oil refineries.[1,3]

EFFECTS

Acid rain has many ecological effects, especially on aquatic environments. Acidic water contributes to more aluminum absorption from the soil, making waters toxic for aquatic animals and threatening their survival. Animals that depend on the water for their food are also affected.[2,3]

Acid rain also removes minerals and nutrients from the soil, leaving trees and plants more vulnerable to disease, cold temperatures, and insects. Moreover, trees' and plants' capactiy to reproduce is also stunted.[2,3]

Acid rain particles in the air are harmful to humans. When inhaled, these have negative effects on heart and lung function.[2]

Natural weathering caused by rain, sun, snow, and wind are accelerated by acid rain. This damages structures, such as buildings, statues, and monuments.[2, 3, 4]

ACTION

Reducing acid rain starts with eliminating the pollutants that cause it. This means shifting to sustainable energy sources and implementing emission regulations and standards. Individuals can do their part by reducing single vehicle use and using public transportation, carpooling, walking, or biking instead.[3, 4, 7]

Acid rain, as the name itself suggests, is toxic. Due to rising pollution, sulphur dioxide and other poisonous chemicals interact with water, evaporate, and fall down on the Earth to damage life on the planet. This is a main cause of forest extinction, as sulfur dioxide in reaction with water is converted into sulphuric acid, which has a devastating effect on the entire flora. Sulphuric acid disrupts the process of photosynthesis, which results in damage to leaves and death of forests. Further, it has devastating effects on plants, aquatic animals and infrastructure. Acid rain has shown to have harmful effects on water and soil, killing insects and aquatic life forms. In addition, buildings, bridges, and stone statues can be damaged because acid rain causes corrosion and degradation of steel structures.

Acid rain seriously pollutes waters, and drastically lowers the water pH levels. A large decrease in pH leads to the extinction of microorganisms, and it impacts the quality of the drinking water and impacts all life. After falling onto ground, acid rain enters underground streams, which further threatens life and the quality of drinking water. This is one of the main reasons for the reduction of drinking water supplies worldwide. And this can have serious impact on human health.

Many parts of the world get heating from coal, pollution from car industry has not been adequately been tackled. On one side, governments are in charge to take responsibility and pass laws addressing the usage and consequences of dangerous chemicals. Also, corporations are asked to switch to renewable energy sources.

“However, this will merely solve the root causes of it all. We need to envision a new system, one that will entirely put the use of fossil fuels and dangerous chemicals in history books. We need to set up a system that will embrace a circular economy, use of clean energy. A design of a totally new paradigm. One of the ways to do this is to get active at the local level, to work closely with companies, local governments, NGOs, scientific organizations and to design a new world. We can change the world for the better with small but steady steps.” (Srdjan Stankovc, Supernatural, 2021)

LEARNING AND TRAINING ACTIVITIES ARE:

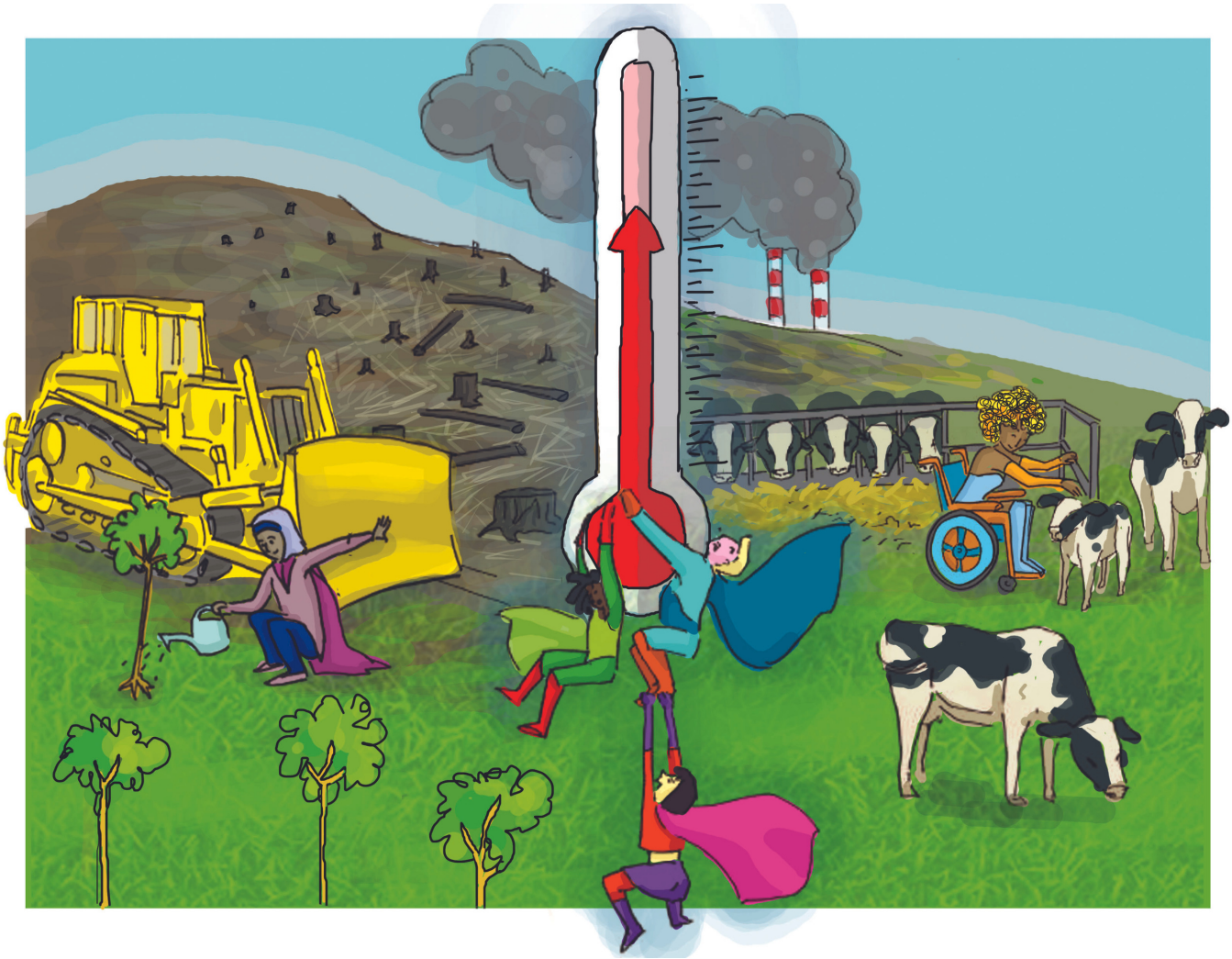
UTOPIA (PAGE 22, IO1.2)

ACID RAIN ROLEPLAY (PAGE 24, IO1.2)

4.6 CLIMATE CHANGE & GLOBAL WARMING

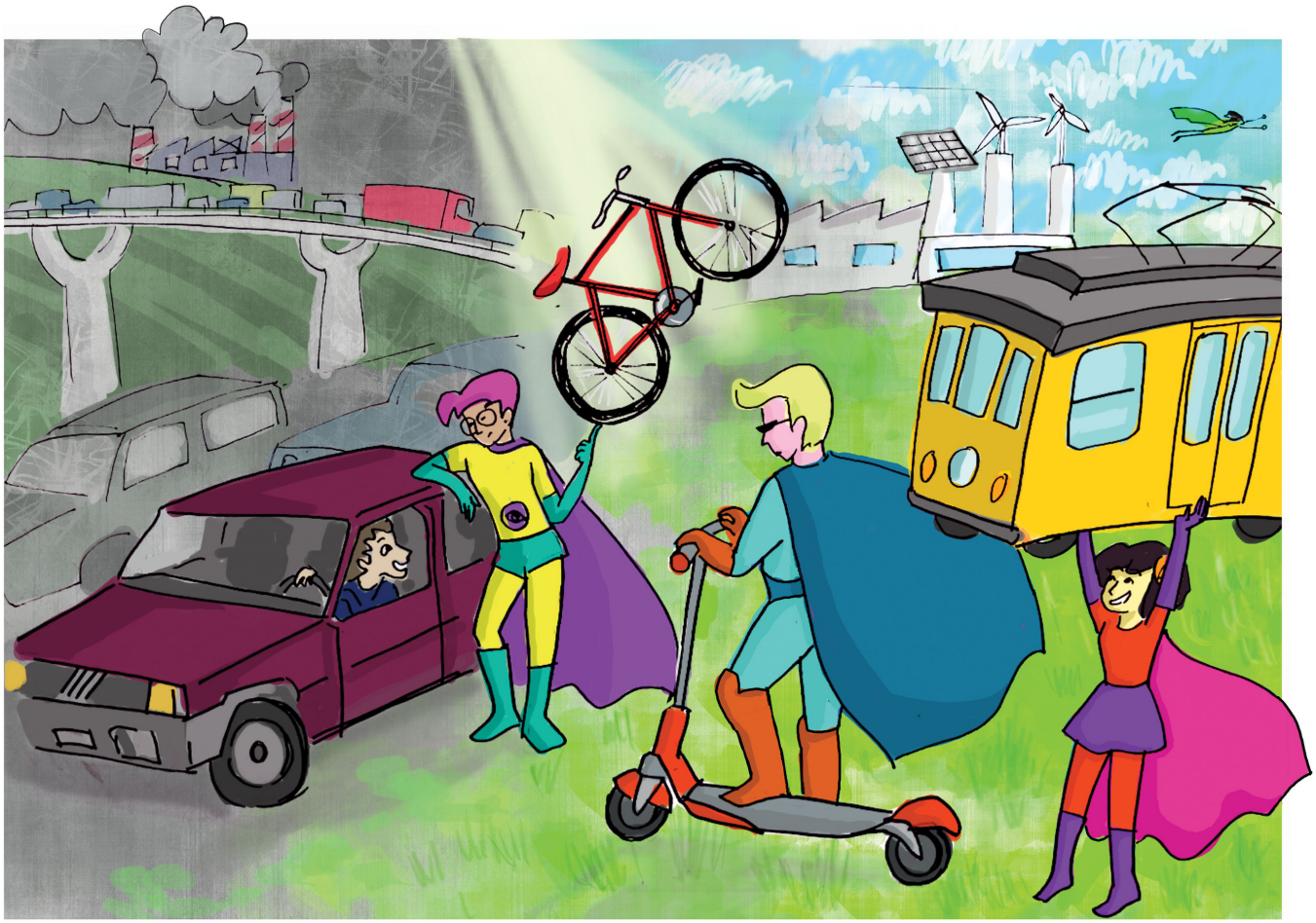
Climate change (and global warming) are the main environmental topic in the last decade. It mainly refers to emissions of greenhouse gases (GHG) that contribute to changes of climate and rise of average global temperatures. The rise of temperatures affects the ice sheets, polar caps, and all ice on the planet where water is stored. The melting of ice will raise the sea and ocean levels and thus impact millions of inhabitants and the infrastructure of people living on the coastline. Climate change threatens people with food insecurity, water scarcity, flooding, infectious diseases, extreme heat, economic losses, and displacement. These impacts have led the World Health Organization to call climate change the greatest threat to global health in the 21st century.
The vast majority of scientists have come to the conclusion that climate change and global warming are caused by human activity. The emissions of greenhouse gases into the atmosphere are the main cause of the planet's ever increasing warming. The greenhouse gases are carbon dioxide, nitrous oxide, methane, and ozone; water vapor also has a greenhouse effect. Scientists argue that rising temperatures on the planet can have devastating effects on all life, and it is critical to take action to avoid the worst scenarios.

The gases that end up in the atmosphere are in a great part caused by the industry. The root causes of almost all of the environmental problems are in the linear economical system that has been in place for more than 200 years.



In this text we will look at the causes and effects of man-made climate change, but it is important to research other scientists who argue differently, in order to have a better and more precise perspective on the issue. No matter which scientific argument is considered, it is a fact that emissions produced by the coal and oil industry do have a devastating effect on human health, biodiversity and the planet overall.

Emissions of greenhouse gases is a serious planetary problem and it calls for planetary solutions. A coal plant in one country can launch poisonous particles into the air and pollute the surrounding countries as well. Nature has no borders, and problems that occur at one place, can cause harm thousands of kilometers away from its source.



It is an open question if global warming trends and climate change problems can be solved. Nature has awesome regenerating powers, but humans need to work alongside nature, too. Although there are many issues to be tackled and solved, and problems are complex, the most important thing is to be focused on causes of the problems, rather than on symptoms and effects. Therefore, people need to be educated and informed in order to seek and develop nature-friendly solutions. Circular economy solutions at home and in companies can be a method as well as enhanced societal participation in decision-making processes. Getting active, starting composting to reduce household waste, buying organic and local goods, creating bee gardens, planting trees are some of possible ways each individual could start with. All in the sense of being the best in the end for the world.

LEARNING AND TRAINING ACTIVITIES ARE:

CHALLENGE THE MYTHS (PAGE 26, IO1.2)

CALCULATE YOUR CARBON FOOTPRINT (PAGE 27, IO1.2)

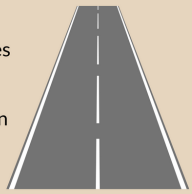
4.7 URBAN SPRAWL

URBAN SPRAWL

Urban sprawl is the rapid expansion of urban areas (e.g. cities, towns, commercial properties) over large expanses of land. This is usually characterised by poor urban planning and a driver of several challenges for the environment.[4,6]

FACTS

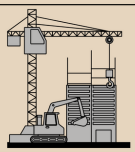
1 million square kilometres of land comprised the world's urban settlement area (cement, asphalt, etc.) in 2010. This is almost double the area of France.[3]



If the current urban sprawl trend continues, the area of the planet covered by urban areas will increase to more than **3 million** square kilometres by 2050.[3]

73% of the European population lives in cities. By 2050, this is expected to increase to 82%.[7]

1,120 square kilometres of natural and semi-natural areas in Europe were lost to urban land development from 2000 to 2006.[7]



CAUSES

Lower land rates in suburbs prompt people to settle outside urban areas.[1]

Unprecedented development, loss of green cover, traffic jams, and overpopulated areas lead residents to move out to new areas.[1]

Improved infrastructure fuels expansion by lowering costs of development and construction.[1]

Population growth causes residents to move out of city areas, as the number of people exceeds the maximum capacity.[1]

EFFECTS

Increased dependency on automobiles and by-products of development and construction causes an increase in air, water, and land pollution.[1,2]

CO_2

Moreover, this contributes to higher greenhouse gas emissions, which has a lot of consequences for the climate and environment.[5]

Expansion of urban areas causes displacement of wildlife and disturbances in the ecosystem, which also has ripple effects for the environment.[1]

Urban expansion also leads to increased risks for natural disasters (floods, wildfires), health issues, sanitation concerns, and the overall quality of life.[2]

ACTION

New urbanism promotes principles of well-designed cities, walkable streets, and sustainable urban practices. Its goal is to create greener cities and support the wellbeing of residents. This limits the uncontrolled expansion of urban areas.[1,2]

Policies and regulations can lessen trends of urban sprawl (e.g. zoning provisions, growth boundaries, and development phases).[2]

Educational programmes aimed to promote the understanding of the effects of urban sprawl and ways to mitigate it are also helpful.[2]

Urban sprawl generally refers to rapid expansions of urban areas and over urbanisation: building of houses, roads and other infrastructure disregarding proper urban planning.
Urban sprawl refers to uncoordinated growth, the expansion of urban areas without concern for its consequences; unplanned, incremental urban growth which is often regarded as unsustainable.
Urban sprawl affects life in many ways: increases travel time from home to work, increases transport costs, creates pollution, and destroys the environment as e.g. living spaces are built, roads railways constructed for which green spaces, forests and fields are replaced by man-made constructions.
Urban sprawl is caused in part by the need to accommodate a rising urban population and is also connected with increased energy use, pollution, and traffic congestion. Additionally, by increasing the environmental "footprints" of metropolitan areas, this phenomenon leads to the destruction of wildlife habitat and to the fragmentation of remaining natural areas.
Worldwide, people are moving to cities. According to the United Nations Population Division, 29% of the world population lived in urban areas in 1950. By the late 2000s this figure had increased to about 49%. In countries of the Global North, this fraction was much higher. In the United States, for example, the urban population rose from roughly 64% in 1950 to about 81% in 2007. Similarly, Japan's urban population increased from roughly 40% to about 66 % over the same period. In contrast, countries of the Global South contain fewer urban residents. In India, for example, the urban population increased from 17% in 1950 to about 29% in 2007. Similarly, Egypt's urban population rose from about 32% to approximately 43% over the same interval*.
It is important to state that urban sprawl is not related to the growing population worldwide. According to data collected in 2002 by the European Environment Agency, the population of a subset of European countries 1980-2000 increased by 6% yet, urban sprawl of these countries increased by 20%. The global trend is that people are moving to cities.
Urban sprawl has a devastating effect on the environment. To make room for new housing, buildings, commercial and industrial zones, fertile land is urbanized, small streams and rivers are put into pipes, and destruction of habitat increases.

*https://www.britannica.com/topic/urban-sprawl

Energy for heating, cooking, cooling, lighting, and transportation is generally produced from polluting and unsustainable sources, such as coal and oil, further contributing to air pollution. Due to rapid urbanization, waste water systems don't get planned or built, creating a huge impact on the ecology of surrounding water systems.
Some other big problems for the communities are also noise and light pollution that urban sprawl is associated with. Generally speaking, urban sprawl is one of the main threats to the natural habitat, because of its complexity and massive impact.

GREEN CITIES

One of the solutions to this complex problem is designing for nature-inclusive cities. Rewilding cities is a new global trend; bringing nature back to urban areas is a new paradigm of urban development.
Cities are rich ecosystems and represent a habitat not only for humans but also for flora and fauna. The inclusion of nature in urban areas raises the quality of life, and cities become more resistant to different climatic conditions. Citizens should be motivated to return nature to cities, and inspire and influence decision makers, architects and the building sector to promote and implement this new paradigm! In order for future urban systems to become real ecosystems, it is necessary to include ecologists, biologists, landscape architects, architects, and designers in decision-making and urban planning, and through a holistic approach to development, encourage urban biodiversity, and thus increase quality of life for all.

ACTIVISM: HAVE YOU EVER BEEN INTERESTED IN DEVELOPMENT PLANS OF YOUR MUNICIPALITY? DO YOU KNOW THAT YOU CAN INFLUENCE THE DECISION MAKERS TO MAKE MORE ROOM FOR NATURE IN YOUR LOCAL TOWN? BE AN ACTIVIST !

LEARNING AND TRAINING ACTIVITIES ARE:

URBAN GARDENING (PAGE 30, IO1.2)
VIA VERDE (PAGE 31, IO1.2)

4.8 POLLUTION

Pollution is the introduction or presence of harmful substances, called pollutants, into the environment. Although pollutants can come from natural causes, pollutants caused by human activity are most damaging to the environment. Due to our overproduction and overconsumption, pollution is increasing in an unprecedented and destructive rate.[4,7]

FACTS

There are three major types of pollution: air, water, and land.

40% of plastic produced annually is disposable, and will only be used for a few minutes before disposal.[1]

80% of litter in the ocean originally comes from land.[1]

60-90% of this is made of plastic materials.[1]

The Great Pacific Garbage Patch contains approximately **1.8 trillion** plastic pieces. This continues to float on the ocean and affects marine with toxic materials and substances.[1]

7 million premature deaths are due to effects of air pollution. Air pollution is also the fourth-largest risk factor for early death.[2,3]

According to authorities, plastic waste kills around **100,000** marine mammals yearly, and millions of birds and fish.[1]

It takes an estimated time of at least **400 years** for plastic products to break down, due to additives.[7]

CAUSES

Runoff is the term for chemicals dumped into waterways, which is often done by factories. Such practices create a toxic environment for aquatic ecosystems.[7]

The extraction of fossil fuels, which is also the main cause of CO_2 emissions, is a major cause of air pollution. Air pollution contributes to climate change, and is also worsened by it.[2,3]

Irresponsible mining practices sometimes leave soils contaminated with toxic substances.[7]

Garbage collection systems are often inefficient and improper, people maintain careless recycling and trash disposal habits. As a result, trash, such as paper, junk appliances, plastic, and cans, accumulate and spoil the landscape.[7]

EFFECTS

Waste accumulation hinder plants from creating and absorbing nutrients and can also cause animal deaths. Moreover, pollutants contaminate the soil and eventually harm people.[7]

Air pollution excaberates climate change by influencing the amount of sunlight absorbed by the atmosphere.[7]

Polluted water exposes humans to hazardous materials, causing immediate or future illness. Air pollutants harm the eyes, throat, and the lungs.[3,6,7]

ACTION

Refrain from using of disposable petroleum-based plastics, eliminate the single-use plastics, and instead utilise reusable and compostable alternatives.[1]

Improving systems in product design, recycling, reusing, waste management, crop rotation, and precision farming contribute to decreasing the production of pollutants.[5]

The cooperation between different actors on both local and international levels, as well as environmental, political, and economic leadership is necessary.[1,7]

Pollution is one of the biggest threats to the health of the planet and the people. Practically every single product that is bought has a trace of pollution.
When it comes to pollution, several industries lead the way:
- Oil industry has a massive negative impact on the environment as it burns non-renewable, toxic fossil fuels to acquire energy. Currently, this powers the global economy.
- The agricultural industry pollutes the land by using pesticides, which has significantly affected the wellbeing of bees.
- Car industry and factories produce other common pollutants, including nitrogen oxide, sulfur dioxide, and hydrocarbons. These chemicals react with sunlight to produce smog, a thick fog or haze of air pollution. Smog makes breathing difficult, especially for children and older adults.
- The construction industry is designed in such a way that it uses lots of energy (heating) and, because it is mainly driven by profit, it disregards the massive negative impact on nature and biodiversity.
- Industries and homes generate waste which pollute the land and water. Plastic also pollutes the land and waters: Microplastic from straws, plastic bags, PET bottles etc. can travel from waste dumps to rivers and oceans and are threatening the animal world.

DID YOU KNOW?

PLASTIC WASTE TURNS INTO MICROPLASTICS AND ENDS UP IN OUR FOOD CHAIN.

Looking at the World Health Organization chart of the pollutants and their effects, the impact of pollution to our health is evident. This is why pollution is one of the most serious problems that needs to be tackled. It is important to note that pollution is the effect while industrial and consummation behavior can be considered as the cause. National Geographic reminds us: „All living things—from one-celled microbes to blue whales—depend on Earth's supply of air and water. When these resources are polluted, all forms of life are threatened*.

* https://www.nationalgeographic.org/encyclopedia/pollution/

Pollution is a very serious and complex problem, and one of the biggest threats to the health of all living beings. Pollution affects the air through burning fossil fuels, while pesticides and poisons affect the land. The industry dumps wastewaters into river streams that end up in seas, oceans, and our food chain. Although a lot is being done to reduce the pollution (filters are being installed onto factory chimneys, wastewater plants are built), this is not sufficient enough, as this is just treating the symptom of the problem, and not the cause.

Srdjan Stankovic from Supernatural 2021 explains: "That is why we need to start setting up a new system, that will be nature and people friendly. The best way to do this is to reduce consumption of goods and to purchase the ones that are planet friendly. No matter if it is clothes, houses or food: our buying choices need to change. We the people need to change our lifestyles and live more in tune with nature. This means riding more bicycles, more walking and less driving a car. This means buying local and whenever possible organic food, rather than buying food that has travelled the world to reach our tables. This means going to repair your old shoes before you decide to buy new ones.".

Activists, NGOs, academic institutions can work together with decision makers and corporations in designing new systems that are clean, and truly sustainable.

LEARNING AND TRAINING ACTIVITIES ARE:

RIVERS AND STREAMS (PAGE 33, IO1.2)

CYCLING (PAGE 34, IO1.2)

4.9 INDUSTRIAL AND HOUSEHOLD WASTE

Industrial waste is generated by manufacturing and industrial processes. All industries and all economical activities create waste, for example:

- **Construction industry**: This industry leaves behind toxic wreckage and debris. Chemicals used in the construction also pose hazards: acetone, chlorobenzene, methylene chloride, paint, petroleum. This is potentially very dangerous if they end up in the water system.

- **Textile industry**: on the surface it's all fashion, shopping and style. Below, the surface textile industry has a massive negative impact on the environment. The chemicals used to dye the fabrics end up as wastewaters in the rivers. Pesticides are used in cotton production, and they poison the land and underwater system. In addition, cotton requires enormous water for irrigation. Mass consumerism leads to outsourced production in developing countries where production workers often work under unethical standards and in working environments often neglecting human rights and working safety.

¾ OF ALL THE CLOTHES WE BUY ENDS UP IN LANDFILLS.

One of the most devastating effects of industrial waste is **pollution of water**. For many industries water is essential for running the production, and the result is wastewaters. If they do not have a proper wastewater treatment, chemicals used in the production can seriously damage the environment.

One of the most vicious industries that creates waste is the food industry. Not only does it leave behind land full of pesticides and poisons, the packaging waste from the food products is colossal. Monoculture and vast single crop lands have a big impact on loss of biodiversity.

Household waste refers to waste produced goods at homes. It is also called domestic waste. Although this waste is not as dangerous as the industrial waste, it still impacts the environment in a massive way. The majority of waste generated by the household are from products that have been designed and packaged in an unsustainable way. Non-hazardous waste can include food scraps, paper, bottles, various plastics and other packaging. Products such as paints, detergents, cleaners, oils, cosmetics, and batteries can contain hazardous ingredients and are referred to as household toxic waste. If not disposed of in a proper manner, they can end up in water or land systems and create the dissemination of toxic chemicals.

Billions of people produce waste every day and this amounts to mountains of garbage worldwide. And much of the waste is not biodegradable. It stays on land for many decades. This has resulted in numerous waste dumps across the globe. While some of them are managed properly, others are just illegal wild waste dumps. These dumps produce 12% of the world's total methane*, leading to both greenhouse pollution and frequent fires, creating additional air pollution.

DID YOU KNOW?

21 BILLION TONS OF MATERIAL FROM PRODUCTION DO NOT END UP IN THE PRODUCT BUT IN WASTE DUMPS. 99% OF THINGS WE BUY OR CONSUME END UP IN LANDFILL IN 6 MONTHS. WE THROW AWAY 50 MILLION TONS OF ELECTRONIC WASTE.

COMPOSTING

In order to reduce household waste, there are several things to do. The first and the best thing is to separate organic materials (food scraps and paper) from other waste materials, such as plastic packaging. The food waste makes up 30-50% of total household waste; lots of food is thrown away.

DID YOU KNOW THE LIFE CYCLE OF DECOMPOSITION?
A PLASTIC BAG NEEDS - 20 YEARS TO DECOMPOSE
PLASTIC COFFEES - 30 YEARS
PLASTIC STRAW - 300 YEARS
PLASTIC WATER BOTTLE: 450 YEARS

A very sustainable solution is compost. Compost is organic material that can be added to soil to help plants grow. Composting keeps food scraps out of landfills where they take up space and release methane, a greenhouse gas.

https://drawdown.org/solutions/landfill-methane-capture

Making compost is simple and fun. All composting requires three basic ingredients:
Browns - materials such as dry leaves and branches
Greens - materials such as grass, fruit and vegetable waste, coffee grounds.
Water – adding water, greens and browns start the magic of compost development.

Depending on weather conditions, place of storage (e.g. smell and flies can have an impact on where to compost), the time period on full compost can vary. But, already after 3-6 months, all food scraps mixed with browns and greens can create perfect compost material that can feed your garden.
As we now know, the Industrial waste is generated by manufacturing and industrial processes. The waste generated comes from various industrial sources and processes, and until a new system of circular economy is used, the majority of problems cannot be solved in the long run. However, there are things individuals and communities can do. Focusing for example on the textile industry. It is the fourth largest industry in the world with a massive negative impact on the planet. The chemicals used to dye the fabrics end up as wastewaters in the rivers. Pesticides used in cotton production end up poisoning the land and underwaters system. ¾ of all the clothes we buy end up in landfills.

EVERYONE CAN DECIDE WHICH PRODUCT TO BUY AND CHANGE THE INDUSTRY. LOOKING FOR SUSTAINABLE BRANDS, BUYING ORGANIC COTTON MATERIALS, SEARCHING FOR NEW MATERIALS, BUYING LOCAL ARE SOME SOLUTIONS.

LEARNING AND TRAINING ACTIVITIES ARE:

COMPOST (PAGE 36, IO1.2)
TEXTILE REMAKE (PAGE 38, IO1.2)

4.10 LOSS OF BIODIVERSITY

Biodiversity is the diversity of the living of the planet, from individual species to the entire ecosystems. Biodiversity is also the variety of genes, the variety of seeds and food crops, and the variety of ecosystems.

DID YOU KNOW THAT THERE ARE AROUND 10,000 VARIETIES OF TOMATOES? HAVE YOU EVER SEEN A BLACK CORN?

All of these varieties have value; they provide numerous ecosystem services. The ecosystem services are among the most important functions of biodiversity: it keeps the air clean, decomposes organic material so to get clean food and water, energy and medicine.

Pollination by bees is a crucial service provided by nature; it reproduces the plant world, which is an essential food source for humans and animals. Insects, birds, plants and mammals play a key role in food production, providing clean water to humanity and removing harmful gases from the atmosphere. Due to pesticides used in agriculture, and other chemical toxins that are being released by the industry, bees are threatened to the point of extinction. If there were no bees to pollinate and to foster biodiversity, life on the planet would collapse in 4 years. Life is literally impossible to sustain itself without pollinators.

Loss of biodiversity is caused by human activities such as fishing, hunting, soil and air pollution, deforestation and massive agricultural activities. These activities destroy the environment and endangers the earth's and all species' survival. Habitat loss, lack of drinking water, lack of food and medicine are evident. Biodiversity loss has a crucial impact on climate change and has a huge effect on human health and the health of the planet.

The web of life that make up the ecosystem and biodiversity are under pressure. Pollution of air and land, cutting of forests, massive mono agriculture, chemical industry destroy our environment and are putting the life of the planet and the people under threat.

According to the Red List of Endangered Species produced by the International Union for Conservation of Nature (IUCN), more than 26,000 species of wildlife are currently in danger of extinction. Bees are particularly endangered because of the pesticide used in agriculture, deforestation and lack of bee-friendly plants.

DID YOU KNOW?

BEES POLLINATE 70% OF FAUNA, AND HELP PLANTS REPRODUCE. IT IS BELIEVED THAT IF BEES BECOME EXTINCT, HUMANS WOULD HAVE ONLY 4 MORE YEARS TO LIVE.

That is why taking actions for the wellbeing of bees is urgently necessary. Urban beekeeping is gaining popularity worldwide. Beehives can be placed in the garden or at rooftops. The best way to learn about biodiversity and how to protect it is to start beekeeping.
Srdjan Stankovic from Supernatural 20201 supports this idea: “We need to motivate young people to get interested in bees. Planting more bee plants in the cities, and setting up beehives in the urban areas is a great way to learn more about biodiversity and to do concrete steps to its protection and restoration.”

LEARNING AND TRAINING ACTIVITIES ARE:

TREEHUGGER (PAGE 40, IO1.2)

BEES (PAGE 41, IO1.2)

5.STAKEHOLDER ACTIONS

To promote environmental awareness among people, including knowledge on ecological balance and the preservation of a healthy environment, different stakeholders need to be involved: individuals, communities, businesses, government and the media.

Whereas these issues were traditionally decided by government, the irreversible climate crisis is forcing individuals, organisations, as well as companies around the world to give priority to these issues and carefully create and implement environmentally-friendly initiatives.

5.1 INDIVIDUALS

Individual actions matter because of multiple reasons. Being informed can thrive and motivate everyone to act in a conscious way. For example, if you know what goods and services are produced causing high pollution levels, you can decrease your environmental footprint by consuming less of that. Other individual action can include personal choices in diet, means of long- and short-distance travel, household energy use, family size, as well as engagement in local and political advocacy around issues of climate change*.
Individual consumption plays a role in the global supply of fossil fuels and greenhouse emissions, and regulates the demand for corporations to produce in a certain way.
Climate solutions exist for nations, municipalities, businesses, investors, homeowners, so that consumers can shift towards a system that benefits all.

Knowing the climate impact of your daily choices can empower you to change your own behavior. With knowledge and action, you can inspire others. Together, you can demand collective action. If all 8 billion people on this planet initiate a small change, the cumulative effect will be tremendous. As some researchers have argued, lifestyle change of people can build momentum for systemic change.
Individuals are most vulnerable to climate crises but are also the most creative beings. Nowadays, many inventions start at the individual level and develop from being technological innovations created by school graduates to become important dents in environmentally-friendly policies. You can be the change, too.

*https://en.wikipedia.org/wiki/Individual_action_on_climate_change

5.1.1 TURNING ECO-ANXIETY INTO ECO-ACTIVISM: YOUNG PEOPLE'S INITIATIVES

The way out of depression and a sense of helplessness is to act. Below are seven initiatives of young people from all over the world that offer climate change solutions. It can be as simple as this:

- Maxime Leroux, a 19-year-old student in France is creating an environmental app to motivate others to make a difference daily: https://www.ecowatch.com/ecowatch-live-one-save-day-2640914814.html.
- Recent Penn State graduate Sarah Schanwald aspires to raise awareness about environmental issues as government intern: https://news.psu.edu/story/620731/2020/05/20/academics/breath-fresh-air-environmental-student%E2%80%99s-internship-fixes-climate.
- A project by Kherann Yao from Côte d'Ivoire to make schools entirely out of recycled plastic bricks and convert plastic waste into modular bricks to build classrooms in Africa, as well as fight pollution, improve education and increase employment through creating a market for recyclables: https://www.unicef.org/press-releases/unicef-breaks-ground-africas-first-its-kind-recycled-plastic-brick-factory-c%C3%B4te.
- Two Indian youth-led sustainability projects that win the Children's Climate Prize 2020: https://www.mynewsdesk.com/se/childrensclimateprize/pressreleases/two-indian-sustainability-projects-win-the-childrens-climate-prize-2020-3047425.
- The Ocean Cleanup, a non-profit organization founded by entrepreneur Boyan Slat in 2013 that successfully catches plastic in the Pacific Garbage Patch: https://theoceancleanup.com/.

5.1.2 IDEAS WORTH SPREADING – INSPIRING TED TALKS

Increasingly more people are getting involved and work hard on climate solutions. Below there are five TED Talks on climate issues to inspire you, give you the hope and encourage you to act right now:

- John Marschall. 3 strategies for effectively talking about climate change – TED 2021.
- Clovel Hogan. What to do when climate change feels unstoppable - TED Talk 2021.
- Greta Thunberg. The disarming case to act right now on climate change – TED 2019.
- Kim Stanley Robinson. Remembering climate change ... a message from the year 2071 – TED 2021.
- Climate Action Tracker. The state of the climate crisis in 2021 - TED Talk 2021.

5.1.3 DEGREES FOR A CAREER IN CLIMATE CHANGE

- Environmental studies and sustainable development are some of the fastest growing fields in both education and employment. As the issues become more significant, this will become an increasingly important field to focus your career on.
- There are numerous lists ranking the best universities in specific environmental fields or providing search on innovative climate-related subjects: sustainable leadership, environmental engineering, climate change science, environmental geoscience, environmental policy, agriculture, political science*.
- A number of universities in Europe are already offering master's programmes in climate change 2021/2022*.
- Many online courses are also available through Coursera.org. You can take a free online course from the online platform EDX and learn about climate science, policy, carbon capture, resilience, or biotechnology, to name few topics.

* https://www.kaplanpathways.com/about/news/the-7-best-degrees-for-a-career-in-climate-change/
* https://www.masterstudies.com/Masters-Degree/Climate-Change/Europe/?page=2

5.1.4 CLIMATE-SMART COMMUNITIES

Both individual and community level can be empowering and impactful in making a difference to the environment. Communities play a decisive role in addressing the climate crisis and can be engaged in sustainable and climate-smart policies and decision-making processes. Starting from community actions such as cutting CO2 emissions, reducing waste and redistributing food, upcycling furniture, further benefits can be generated, such as improved health and wellbeing, increasing community cohesion, supporting skills, training and jobs.

Through the work of local community, climate action can be sparked and sustained through small and tangible steps including: making small changes to behavior, harnessing people's desire to connect with their communities, using good examples to demonstrate what's possible, measuring and showing the difference you are making, creating a network of advocates and enthusiasts, taking active steps to be diverse and inclusive and to be honest about what is and isn't effective.

Below are three best practices from project partner communities that highlight different community initiatives on a way to become sustainable and climate-smart. Further examples can be found in the Handbook: Practical Guidelines, Chapter 3.

GREEN WAVE IN RIJEKA, CROATIA

Rijeka 2020 project was created to transform the grey post-industrial City of Rijeka within the framework of European Capital of Culture. According to the Rijeka 2020 website, the aim of the Green Wave project is to fill the city's areas, squares, streets, windows and balconies with remedial, fragrant, edible and indigenous herbs. In this way, the European Capital of Culture wants to contribute to the positive evolution of the cityscape, to improve the microclimate of city streets, and to raise awareness on ecology. SenzoRI, sensory garden of the Krnjevo

Kindergarten (suburb of Rijeka), which is part of the participating program Green Wave, was finished in February. The project aimed to arrange the garden for generations of children, with special emphasis on sensory integration and preservation of the environment and nature. From now on, the children of Krnjevo will have the opportunity to enjoy the new yard, which includes a wall with water games as well as a music wall. A new seesaw has been purchased, sandboxes have been arranged and a fragrant garden has been planted. This is a unique example of such a garden in the immediate vicinity of Krnjevo.

BREATHING SPACE FOR THE SAVA RIVER, SERBIA

Helen Mayer Harrison and Newton Harrison created their art project Breathing Space for the Sava River in 1989-1990. While on a DAAD – German Academic Exchange Service – fellowship in Berlin, they were invited to the (former) Republic of Yugoslavia by Dr. Hartmut Ern, of the Berlin Botanical Gardens. They were asked to help with the formation of the nature reserve in the area that had once been a no-man's land situated at the border between the former Austro-Hungarian and Ottoman Empires. This nature reserve existed as a many hundred sq. km floodplain and the last of its type remaining in that part of Europe with endangered species and an ancient farming community who lived by an endangered wetland oak forest, a miraculous place. They felt that such a reserve would find its uniqueness under attack from effluent of the surrounding industrial farming. Therefore, they proposed a nature corridor to protect it that would run the length of the Sava River from its twin beginnings above Ljubljana to its ending in Beograd at the Danube River, where it supplies the lower Danube with one third of its clean water and presented it as an art project.

PROJECT "GREEN BAROMETER", LATVIA

Five leading Latvian nature protection organizations- Latvian Fund for Nature, World Wildlife Fund for Nature, Latvian Ornithology Society, Association of Latvian Organic Agriculture and NGO "Green Liberty"- in 2020 started to implement a project called "Green barometer". The goal of the project is to supervise and evaluate political development related to nature and environment topics, to encourage discussions about nature and environment problems among policy makers and to achieve the inclusion of these issues in the agenda of Latvian policy makers and parties. This is the first comprehensive political parties and political decision valuation from an environmental perspective in Latvia.

Within the project, the organisations are creating regular policy reviews who are looking at current issues related to environment, nature and climate questions, but the main activities are connected to elections. "Green barometer" was analysing and evaluating political party programs in 2021 during regional elections and will do the same in 2022 during parliamentary elections. Project partners in this project are also giving their view and vision of what are the main "green" actions that need to be included in party programs and invite politicians to discussions. Discussions are called "Green Grill" and they are happening during the time of elections and throughout the project. Also the organisations are challenging politicians to "Green tests" to test politician knowledge about environmental questions and their environmentally friendly habits. And they are creating a podcast called "Green Barometer" where they are speaking about environmental politics with various experts.

This is a big step towards more conscious policy makers at the local, regional and national level. And it helps people to get a deeper look at the political party programs, plans, politician opinions and perspectives about nature and environment topics.

This project will be active till October of 2023 and is supported by the programme "Active citizens fund*".

* More about the project and activities in Latvian: http://www.zalais-barometrs.lv/

5.2 INDUSTRIAL LEVEL/BUSINESS

According to Boston Consulting Group, focusing on sustainability in business models and corporate governance can give businesses a lasting competitive advantage*. There is global consumer demand for companies that care about environmental issues*. Doing so can attract the best talents, as most millennials are even willing to take a pay cut if it is to work at an environmentally friendly company. It can also lead to new opportunities, as a strong sustainability strategy can help drive companies* into new markets.

There are many actions businesses can take to address climate change. The leading US business magazine Forbes outlines a few*:

Work towards carbon neutrality, which means to reduce carbon emissions and switch to renewable energy.
Bring more innovation, focus on renewable energy and waste management, involve all employees in brainstorming and trying new things and encourage diversity of genders, ages and cultures.
Drive your supply chains towards sustainability and carbon neutrality, so it will require their supply chain vendors to become sustainable, resulting in a ripple effect.
Work to change behaviors inside your offices to get used to working in a sustainable environment, so that employees may take their changed habits back home and influence their families in a big way.

Businesses are the main polluters and the driving forces of climate change, especially with industrial activities, agriculture

* https://www.bcg.com/capabilities/social-impact-sustainability/climate
https://www.nielsen.com/us/en/insights/article/2018/global-consumers-seek-companies-that-care-about-environmental-issues/
https://www.fastcompany.com/90306556/most-millennials-would-take-a-pay-cut-to-work-at-a-sustainable-company
https://www.forbes.com/sites/forbesbusinesscouncil/2021/03/24/actions-businesses-can-take-to-fight-climate-change/?sh=749d054c3379

and overfishing, but they can be a driving force to reverse the impact of global warming if they change their business model and fulfil the demand for environmentally sustainable products. As drivers of innovation and having the resources and power, they have their role to play in the global ecosystem to resolve the current climate crisis. They can help change customer behavior, and vice versa, customer behaviors can influence supply by making more environmentally conscious purchases, supporting fair trade, checking the eco certifications. Thus, all stakeholders play a crucial role in reducing emissions and slowing climate change, and their cooperation at all levels of society is needed.
Industry moves the world: buy, spend, trash, is the concept of development. Everybody can act, governments, corporations, individuals, e.g. through purchasing products and brands that have a proven track record of working in harmony with nature. There are many things we can do as activists. The process is long and complex, but there are ways and solutions to global environmental problems.

5.2.1 CIRCULAR ECONOMY: A NEW ECONOMIC PARADIGM

There is a need for a new economic model that implies a complete change of approach to the economy. This approach involves changes in all segments from product design: use of new material types, use of resources in a responsible manner, new energy sources, new distribution ways, new approach to sales, even marketing. Circular economy leads to ecosystem renewal, and positive impacts on nature and society.
The very concept of a circular economy is quite simple. Dismantling the existing economic model however is very complex, because we are all very dependent on the existing model. The current economic model of most countries and companies involves the use of planetary resources to produce as many products as possible, most of which will end up in landfills. This concept of resource use is called linear in theory. Such a system is unsustainable from the aspect of the environment and it is an approach that has a negative effect on the health of people and the planet.
The circular economy is evident in many situations from everyday life. The simplest example is family food management. For

example, if we buy apples and don't eat them on time, they start to overripe. We have two solutions: to throw the apples away or to make an apple pie. Another example is after we have eaten our jam from the glass jar, instead of throwing the jar to waste, we can use the glass jar for food storage.

There are several important aspects of circular economy:

- Design: Designing products that can be easily recycled or reused, or easily repaired. Current design of products in most cases is not circular. Products cannot be easily recycled or be repaired (like smartphones).
- Materials: Circular economy advocates the use of biodegradable materials or materials that can be reused in the production process; materials from which something new can be made. Like this, products stay longer in the production life cycle. This has positive effects on reduction and elimination of waste and reduction of resource exploitation.
- Energy: Circular economy promotes clean energy sources and directly impacts the reduction of pollution.

Circular economy is about using alternatives like electric cars, trains that run on electromagnetic field (Maglev). It is an economy that uses clean energy (solar, wind, geothermal). It is the economy that could return the miraculous hemp, from which 75,000 products can be made including oil for cars and industry, clothes, houses, paper, furniture.

5.2.2 DESIGN OUT WASTE AND POLLUTION

What if waste and pollution do not occur at all during the production process for products and services?
Circular economy invites all to make concepts and models that do not create waste and pollution. This can be done at the earliest stage of the production process: the design. All industrial processes start with design. This is why it is important to design products and services with the lowest possible impact on the environment.
In the initial phase of the circular system, the design of products and services defines the possible activities of the next phases of

the circular economy. Companies need to rethink the design of the products and services, from the very beginning of creation. This includes types of resources used in production and the way they are assembled. What are the recycling possibilities, how efficient is the use of resources, how long is the product life, can the product be easily repaired? These are the questions that need to be answered before starting the production process and launching the goods onto the market.

REFUSE, REUSE, REPAIR, RETHINK, RECYCLE

Keep products and materials in use: Can we create an economic model that uses materials endlessly in a circular way, instead of endlessly exploiting resources? Do you remember your grandma's washing machine? It lasted for 30 years and it is probably still working. The idea is to keep the materials that make up the product in the cycle for as long as possible, without losing its value and without ending it up on a landfill.
Remember these five simple rules: 5R: Refuse, Reuse, Repair, Rethink, Recycle!

CAN YOU THINK OF WAYS TO REDESIGN PRODUCTS OR UPCYCLE? WHY NOT ALSO MAKE A PURSE OUT OF AN OLD PAIR OF JEANS OR, FROM OLD BRICKS YOU COULD MAKE PATHWAYS FOR YOUR GARDEN.

Materials that cannot be biodegradable must be made in such a way that they can be easily recycled, or converted into something else. This means that we change the use and development of materials that are more biodegradable and can be easily recycled without disturbing ecosystems.
Circular economy promotes products and things that can be easily repaired - a big trend are repair shops or do-it-yourself workshops. Repair workshops are opening in shopping centers. There is no reason to buy a new pair of shoes every season. It is important that products have been designed in such a way that they could be easily repaired.

DID YOU KNOW?

THAT ALL THE MEDALS AT THE 2020 OLYMPIC AND PARALYMPIC GAMES IN TOKYO WERE MADE FROM RECYCLED ELECTRONIC WASTE? A PROJECT WAS STARTED IN 2017 TO COLLECT ENOUGH ELECTRONIC WASTE, INCLUDING OLD SMARTPHONES AND LAPTOPS, TO IMPLEMENT THIS CIRCULAR IDEA.

The circular economy also leads to new trends and the creation of new services: sharing and renting. Sharing cars, bicycles, renting clothes or sharing flats. Parents that have small kids exchange clothes and equipment for children and babies: strollers, shoes, wardrobe, feeder. This is a circular economy and we all can participate. Owning things that lose value over time individually can be rethought while involving others around you. Sharing spots for transportation, clothes and other goods is becoming more and more popular and everyone can start as of now. What would you like to share? A pair of jeans, your bike or even food? You can just start!

DID YOU KNOW?

IN DENMARK, ONE CAR, WHICH IS DESIGNED FOR 4 PASSENGERS, TRANSPORTS ON AVERAGE ONLY 1.4 PEOPLE A DAY - GO MORE APP WAS MADE SO PEOPLE CAN SHARE CAR SEATS. OVER A MILLION PEOPLE NOW DRIVE VIA THE GO MORE APP IN DENMARK, AND CAR OWNERS EVEN EARN SOME BUCKS.

Can we not only protect nature, but also improve its status? The circular economy of the future is an economy that uses renewable energy sources in the process of production, storage and distribution.

5.3 POLITICAL LEVEL/POLICIES

Climate change emerged as a political issue in the 1970s, where activist and formal efforts were taken to ensure that environmental crises were addressed on a global scale. International policy regarding climate change has focused on cooperation and the establishment of international guidelines to address global warming. Domestic policy on climate change has focused on both establishing internal measures to reduce greenhouse gas emissions and incorporating international guidelines into domestic law*. Despite the concerns raised about the treatment of those most impacted by climate anomalies, e.g. the developing nations and marginalised groups, the political framework brings awareness and validates climate action on all levels, without which sustainable change is impossible.

The growing speed of irreversible natural catastrophes, such as wildfires, tornadoes, floods and record high temperatures in summer, shifts the focus from climate change being a side issue to climate emergency from 2016 onwards*, and forces governments to act.

The world is in need to see not only long-term change, but also immediate actions. Since the politicians depend on the support of the community, and the community is affected by the results of their actions, the interlinked nature of relations means that there is a need to join forces and foster collaboration of all society sectors, so that local, national and global climate goals are achieved, and the individual and collective impact can multiply and synergise.

https://en.wikipedia.org/wiki/History_of_climate_change_policy_and_politics
https://en.wikipedia.org/wiki/Climate_emergency_declaration

5.3.1 LOCAL, NATIONAL, INTERNATIONAL LEVELS

For over a decade, climate change has been considered one of the most significant political issues facing communities on local, national and international levels. In order to address this challenge, attention needs to be focused not only at the international level of treaties and conventions, but also on how climate protection policy is taking shape at the local level.

On the local level, the main local vulnerabilities dictate the action plans. For example, flood protection and water management, built environment and urban planning. Therefore, on the local level, different patterns of adaptation planning and adaptive capacity were identified among different regions.
Large municipalities generally fund adaptation locally, whereas international and national funding appears to be more important for adaptation in less urban or densely populated territories.
On the national level, it is important to take, case by case, the national climate change policies, the structure of local governments, their competencies and powers, the institutionalisation of local climate change policies, as well as the most important spheres of action and the different roles played by municipalities in local climate protection policy.
Internationally, the commitment of the countries when it comes to Climate Change has increased within the last 30 years through numerous agreements and treaties on the EU level as well as globally. However, the main changes in implementation have been mostly observed within the last decade, paving a top-down way for the countries to implement on local as well as national level, while at the same time collaborating internationally.

5.3.2 INTERNATIONAL INITIATIVES

The last 30 years, starting with the UN Framework Convention of Climate Change, mark a visible shift in the perception of climate change. On the global level, the main relevant milestones to consider are the following:

United Nations Framework Convention on Climate Change (1992)
The Convention marks a shift in recognising a problem, with the main aim of achieving stabilization of greenhouse gas

concentrations in the atmosphere. It entered into force in 1994*.

Kyoto Protocol (1997)
Operationalizes the United Nations Framework Convention on Climate Change by committing industrialized countries and economies in transition to limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets. The Convention itself only asks those countries to adopt policies and measures on mitigation and to report periodically*.

Bali Climate Change Conference (2007)
The Bali Action Plan, which launched a "new, comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, now, up to and beyond 2012", with the aim of reaching an agreed outcome and adopting a decision at COP15 in Copenhagen*.

Copenhagen Climate Change Conference (2009)
The Copenhagen Accord contained several key elements on which there was strong convergence of the views of governments. This included the long-term goal of limiting the maximum global average temperature increase to no more than 2 degrees Celsius above pre-industrial levels, subject to a review in 2015. However, they did not agree on how to do this in practical terms.

The Paris Agreement (2015)
The Paris Agreement is a landmark in the multilateral climate change process because, for the first time, a binding agreement brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects. It works on a 5- year cycle of increasingly ambitious climate action carried out by countries. By 2020, countries submit their plans for climate action known as nationally determined contributions.
Furthermore, it invites countries to formulate and submit by 2020 long-term low greenhouse gas emission development strategies. And last, it provides a framework for financial, technical and capacity building support to those countries who need it*.

https://unfccc.int/process-and-meetings#:d8f74df9-0dbd-4932-bf3c-d8a37f8de70e
https://unfccc.int/kyoto_protocol
https://unfccc.int/process-and-meetings/conferences/past-conferences/bali-climate-change-conference-december-2007/bali-climate-change-conference-december-2007-0
https://unfccc.int/process-and-meetings/conferences/past-conferences/copenhagen-climate-change-conference-december-2009/copenhagen-climate-change-conference-december-2009
https://www.un.org/en/climatechange/paris-agreement

COP26

As of Fall 2021, COP26 was the most recent and the most actionable global conference on the climate crisis. It involved 197 attending parties and resulted in the Glasgow Climate Pact. Notably, this was the first climate deal to explicitly commit to reducing the use of coal. Some other milestones of the pact include better regulations of the carbon offsetting market, the introduction of the term “climate justice” into the conversation, more commitment to phasing out fossil fuels, larger funding for mitigating the devastating effects of the climate crisis – especially in the Global South. And, importantly, the review and updates of countries’ pledges to climate goals were accelerated from five year cycles to yearly cycles, underlining the sense of urgency and emergency.

United Nations Sustainable Development Goals

The Sustainable Development Goals or Global Goals are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The SDGs were set in 2015 by the United Nations General Assembly and are intended to be achieved by the year 2030*. The SDGs cover essential climate topics such as Clean Water and Sanitation (SDG6), Affordable and Clean Energy (SDG7), Sustainable Cities and Communities (SDG11), Responsible Consumption and Production (SDG12), Climate action (SDG13), Life below Water (SDG14), Life on Land (SDG15).

EU Green Deal (2019)

The European Green Deal’s main aim is to improve the well-being of people, making Europe climate-neutral and protecting the natural habitat, leaving no one behind.

The aims of the EU Green Deal are: becoming climate-neutral by 2050; protecting human life, animals and plants by cutting pollution; helping companies to become world leaders in clean products and technologies; ensuring a just and inclusive transition. The Commission has further committed to propose a European Climate Law, turning the political commitment into a legal obligation and a trigger for investment*.

https://sdgs.un.org/goals

https://ec.europa.eu/commission/presscorner/detail/en/fs_19_6714

European Youth Goals / EU Youth Strategy 2019-2027
The EU Youth Strategy is the framework for EU youth policy cooperation for 2019-2027, based on the Council Resolution of 26 November 2018. EU youth cooperation shall make the most of youth policy's potential. It fosters youth participation in democratic life; it also supports social and civic engagement and aims to ensure that all young people have the necessary resources to take part in society. The EU Youth Strategy focuses on three core areas of action, around three words: Engage, Connect, Empower, while working on joined-up implementation across sectors. During a 2017-2018 dialogue process which involved young people from all over Europe, 11 European Youth Goals were developed. These goals identify cross-sectoral areas that affect young people's lives and point out challenges*. One of the goals, Sustainable Green Europe, shapes the understanding of sustainability and climate protection from the youth perspective.

Through various initiatives, commitments and careful planning from local to international level, people are changing their lifestyle to help protect the plant. **In the words of President von der Leyen on the Occasion of the Adoption of the European Green Deal, this progress may be Europe's 'man on the moon' moment, uniting communities to act for a green, sustainable world.**

https://ec.europa.eu/youth/news/eu-youth-strategy-adopted_en

5.4 MEDIA

The media plays an important role in society as a source of information, but also as a "watchdog" or scrutiniser. Since the media shapes public opinion, the coverage of climate emergency reports influences the perception of the topic by individuals, communities, industries and politicians.
The rhetoric around global warming has changed a lot over the last 20 years from climate denial to a general scientific consensus that human activity is driving global warming. Still, there are now subtler ways of undermining action on climate change that range from looking at the cost of climate solutions to the impossibility of the transformations that are needed. Also, there is still only a slice of media coverage, not the full span of places where people are getting information about climate change — social media and newsprint, as well as conversations with friends and family*, and it varies from country to country. Media attention is especially high in carbon dependent countries with commitments under the Kyoto Protocol*.

There is a variety of sources to learn about climate issues. Find out more in the upcoming Resources Chapter.

https://grist.org/science/good-news-the-media-the-facts-on-climate-change-bothsidesism/
https://www.kooperation-international.de/uploads/media/Media.Attention.for.Climate.Change.pdf

6 RESOURCES: LITERATURE, PODCASTS, MOVIES, ART, PERSONALITIES, PROJECTS

6.1 PROJECTS AND BRANDS

- Designing for Climate Action: A circular economy project (Activities for educators):World's Largest Lesson's Design Thinking Project, created in partnership with TU Delft University of the Netherlands, supported by UNICEF and UN. 2020
- Patagonia
- GOT Bag
- Armed Angels

6.2 LITERATURE AND SCIENTIFIC STUDIES

- CLEAN Climate Literacy & Energy Awareness Network
- The CLEAN Collection of Climate and Energy Educational Resources: A collection of 700+ free, ready-to-use learning resources rigorously reviewed by educators and scientists suitable for secondary through higher education classrooms.
- Climate Curriculum | K-12 Science Lessons on Climate Change. A comprehensive curriculum that provides engaging and informative science lessons on Earth's changing climate.
- Shell Study: A study with young people in Germany aged 12 - 25. Besides researching on the political and societal beliefs of young people, issues concerning the environment is a major "worry factor" of young people, compared to just 10 years ago, when young people's major concern was economic (finding jobs, a stable salary, etc.)
- Country progress on climate change education, training and public awareness: an analysis of country submissions under the United Nations Framework Convention on Climate Change 2019.

- Hargis, Kristen & McKenzie, Marcia. (2021). Responding to Climate Change: A Primer for K-12 Education. The Sustainability and Education Policy Network, Saskatoon, Canada.

6.3 ACTIONS AND GUIDES

- UN Climate Change Learning Partnership (podcasts, learning platforms)
- Office for Climate Education (OCE): Activities for teachers
- UN Action on Climate Empowerment (ACE)
- Youth for Climate Action
- Free online course on Community Based Adaptation to Climate Change
- European Commission: Our Planet, Our Future -a magazine style resource for young people about climate change
- United Nations Lazy Person's Guide to Saving the WorldClimate change: Biggest global poll supports 'global emergency'

6.4 MOVIES

- More than Honey
- Seaspiracy (Netflix)
- Cowspiracy (Netflix)
- The Founder
- Before the Flood (Youtube)
- El Olivo - the Olive Tree (You Tube or Amazon)
- My Octopus Teacher (Netflix)
- Die überschätzte Spezies (Arte or You Tube, in German)
- Lösungen gegen den Klimawandel (Arte, in German)
- David Attenbourough Our Life On A Planet
- Michael Moore Planet of the Humans

6.5 SOCIAL MEDIA

You may choose to follow one of 54 sources collected in this blog: https://onlinepublichealth.gwu.edu/resources/sources-for-climate-news/.

Alternatively, for direct opinions, you can follow on Twitter the top climate experts*:

1. MICHAEL E. MANN
@MichaelEMann
Climate Scientist, Professor and Director of the Penn State ESSC; Author of Dire Predictions, The Hockey Stick & the Climate Wars, and The Madhouse Effect.

2. DR. AYANA E. JOHNSON
@ayanaeliza
Marine biologist, founder/CEO @OceanCollectiv, Brooklyn native. Madly in love with our planet and solutions for the climate crisis.

3. MARSHALL SHEPHERD
@DrShepherd2013
Atmospheric Sciences Professor, Fmr AMS Prez/NASA scientist, Host, Weather Geeks, Alpha, 3x FSU Alum, Forbes Contributor, Tweets just mine. RT not endorsement.

4. KATHARINE HAYHOE
@KHayhoe
Not suspicious, just Canadian. Climate scientist, @TTUCSC director, poli sci prof, knitter, pastor's wife, mom. TIME100 + Fortune50. First in line for cloning.

5. ESTHER NGUMBI
@EstherNgumbi

University of Illinois @Urbana-Champaign, PhD Entomology, Activist, AAUWAlumna, FoodSecurity, OYESKAGREENS. http://www.estherngumbi.com/http://www.fauluacademy.org/

6. ED HAWKINS
@ed_hawkins
Climate scientist at University of Reading | Creator of climate spirals & warming stripes | IPCC AR6 Lead Author | Leads http://weatherrescue.org| Views own.

7. ASTRID CALDAS
@climategeek
Climate Scientist @UCSUSA. Thirsty for knowledge and a broader understanding of all things climate change. Opinions and snarkiness are my own.

8. DANIEL GEBREGIORGIS
@dgebregiorgis
Interested in the evolution of Earth's climate: past-present-future. Postdoc @GeorgiaStateU. From – 9˚00'30.3N 38˚47'45.2E.

9. CARA AUGUSTENBORG
@CAugustenborg
Environmental Scientist @UCDEnvPolicy Fellow; Chair @FoEEurope; Adviser @EPAIreland; #DownToEarth @IvanYatesNT @NewstalkFM @ClimateReality Leader.

10. PRAKASH KASHWAN
@PKashwan
Prof. @UConn | @SPEAIUB PhD | Book: Democracy in the Woods http://tinyurl.com/jy2gmtu| Climate Governance & Justice; Env. Policy & Politics; Int. Development.

11. KIM COBB
@coralsncaves
40% Climate Scientist, 40% Mom, and 20% Indiana Jones. Unapologetically obsessed with carbon. Director, http://globalchange.gatech.edu . She/her.

12. MARK BRANDON
@icey_mark
Polar Oceanography Prof at the @OpenUniversity. Londoner. Proud to have worked with the BBC on #FrozenPlanet, #BluePlanet2 & others. Heart always in the ice.

13. DR. JACQUELYN GILL
@JacquelynGill
Ice Age ecologist in a warming world. Professor @UMaine. Co-host of @ourwarmregards. Like Dana Scully, with mud and mammoths.

14. ANTTI LIPPONEN
@anttilip
Research scientist at Finnish Meteorological Institute (@IlmaTiede). #Satellite images, #aerosols, #climate, #remotesensing, #dataviz, etc. Opinions are my own.

15. TWILA MOON
@twilamoon
Cryosphere, climate, #scicomm. Scientist at National Snow and Ice Data Center, University of Colorado. Co-Founder/Co-Director of Wheelhouse Institute.

6.6 GLOBAL MOVEMENTS

- Fridays for Future
- Earth Tribe: global youth movement for environmental action
- Creative Climate Cities
- Zero Waste Networks
- ActNow: United Nations campaign for individual action on climate change and sustainability
- Protect Our Planet (POP) Movement

6.7 ART

- Performances where trees are illegally planted
- Bordalo II (Street Art from garbage or recycling)
- Artistic projects from Lavrar o Mar
- Heartbeat of the Earth: A series of online artworks interpreting climate data
- MarMotto project by Sciaena - using art as a means to transmit this message in a simple, incisive, creative way and in order to generate action

6.8 PERSONALITIES

- Greta Thunberg
- Luisa Neubauer
- Leonardo di Caprio
- Roza al Hassan
- Kub Adobeja

- Sebastiao Salgado (Brazilian photographer): Reforestation of Fazenda Bulcão, Brazil
- James Ferraro: Anno 6G

6.9 TECHNOLOGIES

- Ecosia: A web search engine that uses the ad revenue to plant trees where they are needed the most
- Food waste or food sharing apps from restaurants, supermarkets, e.g. TooGoodToGo, Olio, FareShare
- Tesla Gigafactory - works on solar panels
- Cargo bike delivery systems
- Circular Economy - Ellen MacArthur Foundation
- LetUs Grow (aeroponic technology)
- Filamentive (3D printing filament made from recycled plastic)
- Ocean Cleanup (Boyd created large plastic clean up systems for oceans and rivers around the world)
- Reusing old things such as textile and shopping bags
- Introducing more products packaged in other materials than plastic, or no packing
- Green Building Materials
- Eco-friendly catering
- Planting trees for every sold fashion item
- Ocean (water) cleaning invention

6.10 GOVERNMENT INITIATIVES

- The Hague sustainable transport model: incorporating cycle lanes which are separate from the roads to encourage everyone to cycle whilst pedestrianising the city, making it cleaner, safer, and increasing wellbeing.
- Generation of green energy (wind, solar power etc.)
- Banning the use of plastic bags or single use plastic products

6.11 COMMUNITY PROJECTS

- Community garden as a tool to talk to the people, to promote healthy and sustainable ideas
- Eco tourism

- Varina: a sustainable project in the field of tourism and social entrepreneurship using bicycles and involving the community
- Boranka: Croatian afforestation campaign
- Sende: rural co-working and co-living space in Northern Spain
- The Palau Pledge from children of the Pacific community
- Culatra Community for Sustainable Energy and Regenerative Water-based Solutions in Portugal
- Projects where everyone of all ages could participate: art or research in the open air, volunteering a few hours a day, multiple days a week or a month.

6.12 INDIVIDUAL ACTIONS

- Growing greens at home
- Buying local seasonal food
- Becoming flexitarian: prioritizing plant-based foods whenever possible
- Volunteering for Ocean Clean-Ups
- Youth Activists in the Algarve

6.13 EDUCATIONAL PROJECTS

- Educational canteens at schools and workplace / community projects like libraries.
- The Eco-Entrepreneur project implemented by the ImpactEco, an environmental association from Belgrade, is designed as an academy for young people who have green business ideas. The goal of the project "Eco-entrepreneur" is to work on the development of green business ideas, which will affect the solution of environmental problems of our country in the field of renewable energy, recycling, biodiversity protection, sustainable development and reduction of water, air and soil pollution
- DOOR: Society for Sustainable Development Design in Croatia
- AqADAPT
- Green Eyes of Ecology
- Triple benefit Principle by Dr. Klaus Renoldner, or CO2 from a doctor's perspective

THIS COLLECTION SHALL SERVE AS AN INSPIRATION SOURCE. IT CAN BE EXPANDED WITH FURTHER EXAMPLES AND SOURCES SHARED AND DISCOVERED DURING IMPLEMENTED CHALLENGES OF THE COMMUNITY CHALLENGERS PROJECT, LOCAL ACTIVISM, INDIVIDUAL OR COLLECTIVE EXPERIENCES.

Co-funded by
the European Union