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Interculturality and Ecosustainability in Digital Storytelling

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# Introduction

This thesis aims to explore two fundamental and interconnected themes in the contemporary context: sustainability and interculturality, with a particular focus on digital storytelling as a tool to promote environmental awareness and intercultural dialogue.

In the first chapter, we will delve into how digital storytelling can be used to raise awareness of environmental sustainability. Different digital narrative modes will be analysed, showing how engaging and accessible stories can sensitise audiences to ecological issues. We will explore how these narratives not only inform but also inspire and motivate collective action towards sustainable practices.

We will begin by examining the definition of digital storytelling. Digital storytelling is a form of narrative that utilises digital tools to create and share stories. This practice combines traditional storytelling techniques with digital media such as images, sounds, videos, and text to create more engaging and accessible stories. It can be used in various contexts, including education, marketing, corporate communication, journalism, and the arts.

"It is a form of discourse that has come to dominate all sectors of society and that transcends political, cultural, or professional divisions, and it lends credence to the idea of what researchers in the social sciences call the 'narrative turn.' " (Christian Salmon, Storytelling, 2007).

For this reason, digital storytelling is characterised by its ability to integrate different types of media (multimedia) and by the possibility of being distributed across digital platforms, such as websites, social media, or apps. All this makes it a powerful tool for promoting environmental sustainability awareness, as it allows for the telling of compelling and visually appealing stories, sensitising audiences to ecological issues in a more direct and emotional way. By using media such as video, images, sound, and interactivity, digital stories can create an emotional connection with the audience and inspire more sustainable behaviours.

In the second chapter, we will focus on interculturality within climate injustice. We will analyse why and how environmental issues affect minority cultures more acutely.

Among the primary causes is geographical location and physical vulnerability: many minority communities, including indigenous peoples and marginalised ethnic groups, live in areas

that are geographically vulnerable to climate change, such as coastal zones, islands, Arctic regions, and tropical forests. These areas are more exposed to extreme climate events such as floods, hurricanes, droughts, and rising sea levels.

Another factor is dependence on natural resources: minority cultures and indigenous peoples often rely directly on natural resources for their livelihood, such as agriculture, fishing, and hunting. When ecosystems are altered due to climate change, their sources of food, water, and means of subsistence are compromised. An example is subsistence farming communities in sub-Saharan Africa, which are among the most affected by desertification and water scarcity caused by climate change.

Next is the disproportionate socio-economic impact: minority communities are often economically disadvantaged and lack the resources to adapt to the impacts of climate change. Without access to modern infrastructure, adequate healthcare, and support networks, these communities have less capacity to recover from natural disasters or mitigate negative effects.

There is also exclusion from decision-making processes: minority cultures often lack adequate representation in both local and international decision-making processes regarding environmental policies. As a result, their needs and concerns are not taken into account in adaptation and mitigation strategies (Concern Worldwide Organsation, 2022).

An example of this is indigenous peoples in the Amazon, who are often not consulted when their lands are exploited for the extraction of natural resources, contributing to deforestation and biodiversity loss, which compromises their way of life. It will be analysed how environmental issues impact interculturality and minority cultures, including cultural and spiritual loss: for many indigenous communities, the relationship with the land is deeply spiritual and cultural.

The destruction of natural habitats and sacred sites represents not only a material loss but also a profound erosion of cultural identity. For instance, for Aboriginal peoples in Australia, the loss of ancestral lands due to bushfires and drought undermines not only their subsistence but also their land-based cultural practices.

Another catastrophic consequence is health and environmental inequality: minority communities are often exposed to higher levels of pollution, as many polluting industries are located near their homes. This ongoing exposure exacerbates environment-related health problems such as respiratory diseases and cancer, without access to basic medical resources to address them.

Indigenous populations and marginalised communities often not only face disproportionate environmental impacts but are also the least represented in global decision-making processes.

This section will highlight the structural inequalities and propose ways in which digital storytelling can help give visibility and voice to these communities, aiming for inclusive and fair solutions.

In the final chapter, we will examine how digital storytelling can facilitate intercultural exchange and promote a global dialogue on sustainability. In this context, it will be particularly relevant to consider postcolonial dynamics and the environmental challenges faced by communities in the Global South.

A reflection on the era we live in, described by G. Giuliani as "monsters and catastrophes" (Gaia Giuliani, 2021 p.115), emphasises how the apocalypse seems to be ever closer, and how the West views the world through a dystopian lens, characterised by fears of invasion, terrorism, and environmental collapse. In this context, the concept of the Western "we" develops defensively against perceived external threats, while vulnerability is unequally distributed, affecting primarily racialised and marginalised populations.

It will be essential to explore how the fear of invasion and repressed colonial violence are present in contemporary Western culture. The recurring idea of a continuous threat from the postcolonial "Other" and, therefore, how the figure of the migrant is perceived as an alien and monstrous figure, particularly in contemporary discourses on the Anthropocene. We will analyse how the genealogy of these fears is traced, beginning with the history of colonialism and racial exclusion, showing how current narratives of borders and separation are a continuation of colonial ones. The figures of the migrant and the refugee are portrayed as threats to Western stability, and these fears are reinforced by media and cinematic representations that perpetuate the idea of a monstrous/catastrophic invasion.

These communities often suffer the most severe consequences of climate change, despite contributing less than others to the causes of the problem. Through digital storytelling, it is possible to give voice to these realities, building bridges between different cultures and fostering a deeper and more nuanced understanding of environmental issues.

The thesis aims to demonstrate how digital storytelling can be a powerful tool to promote interculturality and environmental sustainability, highlighting climate injustices and facilitating a more equitable and informed global dialogue.

# **Chapter One**

# **Defining Digital Storytelling**

# 1.1 What Is Storytelling?

As mentioned in the introductory chapter, digital storytelling is a form of narration through digital tools, and in this chapter, the goal is to demonstrate how this type of storytelling can give voice to environmental and intercultural issues that have become a part of everyday life. Let us start by analyzing the characteristics of storytelling.

Storytelling is a method of narration to highlight real events and explain them according to a logic of meaning, in a context where emotions find their expression through the form of the story. Narrative thinking organizes personal and interpersonal experience in the same way that narrative discourse re-elaborates reflection. A story is told to remember; we look at the interiority (narrative in a reflective function) rather than at the context in which we are immersed.

Every public speaker hopes to leave their audience full of hope and motivation at the end of their speech. For this to happen, it is important to organize the narrative in such a way that keeps the listener engaged.

The development of storytelling, in fact, starts from some fundamental principles: Organization, narration, interpretation.

The organization of the story, or the experience that is being told, is important for the flow of the speech: no one likes to listen to something that is confusing and scattered, and it is often easy to lose focus on the speaker if the ideas are unclear.

Narration, on the other hand, is a process that provides the audience with educational and cultural value, as it stimulates reflection during the narrative. To achieve this, it must follow essential criteria such as:

- Sequentiality: the order given to the story;
- Specificity: highlighting seemingly insignificant details;
- Intentionality;
- Verisimilitude: the listener's perception of the story;
- Composability: the intertwining of narrated parts;
- Referentiality: how plausible the story is;
- Belonging to a genre: fabula and plot.

The narrative aspect in storytelling is important because the listener will identify with the narration, so it must present a familiar and orderly internal structure. Another essential element is the presence of factors that can evoke emotions.

Joe Lambert (founder of the Center for Digital Storytelling in California) identifies several elements that help in taking a personal approach to storytelling, such as: personal point of view, a narrative structure that raises questions and provides non-trivial answers, the inclusion of emotional and engaging content, an effective economy of narration, and a rhythm that suits the narrative style.

The fundamental characteristic of a story is its ability to increase user attention through the perception of authenticity.

Finally, an important aspect of storytelling that should not be underestimated is interpretation: the process of representing reality through projection and reflection. From this, the storytelling methodology (reflective learning) is developed, divided into phases:

- choosing the goal and the target: what you want to communicate and to whom
- defining the timeline: availability of the people involved
- execution: choosing the genre and writing the script
- evaluation feedback from the audience.

In addition to the fundamental principles of storytelling, let us explore eight fundamental techniques identified as storytelling features through which content can be structured in story form. These eight techniques are:

- 1. In medias res
- 2. False start
- 3. Nested loops
- 4. Monomyth
- 5. The Mountain
- 6. Ideas that converge
- 7. Petal structure
- 8. Sparklines

#### 1.In medias res

It refers to when your story begins in the action and then moves back to the beginning to tell how it got there. Your audience will be riveted from the start by being taken to the most exciting part in your story. They will stay interested until the end.

#### 2. False start

When you start telling a predictable story, but then suddenly stop it and start again, it is called a "false beginning". The audience is deceived and believes they are safe, then is shocked when the situation is reversed.

### 3. Nested loops

Nested loops are a storytelling technique that allows multiple narratives to be layered one inside the other. The most important story, which is the heart of the message, must be placed at the centre. The surrounding stories will elaborate or explain this central principle. You should always start the first story and finish the last.

#### 4. Monomyth

Monomites (also known as hero's quest) are narrative structures found in folk tales, myths and religious writings all over the world. In a monomyth, the hero is called upon to leave his home and embark on a difficult journey. He leaves a familiar place and moves to an unknown and dangerous place.

Thus the monomyth is a classical theme centred on the figure of the hero who leaves his home to embark on a journey to unknown places.

#### 5. The Mountain

The mountainous structure is used to trace tension and drama in stories. Because it allows us to trace certain events in a story, it is similar to a monomyth. Since it does not necessarily end happily, it is unique. The first section of the story is devoted to the setting. This is followed by a series of small challenges and escalating actions leading to the climactic finale.

#### 6. Ideas that converge

The convergence of ideas is a framework in which different strands of thought are combined to create an idea or product. It can be used to demonstrate the birth of a movement. It can also be used to explain how an idea was born from the collaboration of many great minds.

#### 7. Petal structure

Petal structure allows you to organize multiple speakers around a single central concept. This is useful for unrelated stories or information that you wish to share all of which relate to one message. Your stories should be told one at a time before you return to the center. Although the petals may overlap, each story should be its own distinct narrative.

#### 8. Sparklines

It is a narrative structure in which the discourse develops on two opposing levels that are continuously intertwined and represent the one "as things are" (to be) and the other "as things should be" (must be).

# 1.2 Digital Storytelling: Brief history and context

Digital storytelling, which originated in California in the early 1990s, is the product of a creative process that, through the use of software, allows individuals to tell their personal experiences. The effectiveness of the narrative approach was first recognized in the field of the humanities. From 1995 onward, this development was identified as the "narrative turn" and quickly extended to the social sciences. Already in the 1980s, economist Deirdre N. McCloskey argued that economics was a narrative-based discipline: "It is no coincidence that the novel and economics were born around the same time." Physicist Steven Weinberg, on the other hand, stated that compelling stories were capable of directing massive research funding. Similarly, Jerome Bruner declared that "the law is based on narratives", while jurist Anthony G. Amsterdam believed that "narrative permeates the legal decision-making process". In 2006, a congress in Finland provided an opportunity to assess the breadth of this phenomenon. With the theme "The Traveling Concept of Narrative", it brought together scholars from various disciplines, all interested in narrative methodology.

After centuries of travel narratives, now storytelling itself is migrating from one scientific discipline to another: from psychology to education, from social sciences to politics, from medicine to law, and even to theology and cognitive sciences. In 2000, Brian Richardson stated: "Narrative is everywhere". Five years later, James Phelan warned of the risk of "narrative imperialism". This shift made the rise of storytelling as a tool of communication, control, and power possible. The narrative turn in the mid-1990s within the social sciences coincided with the growth of the Internet and the evolution of information and communication technologies, laying the foundation for a "storytelling renaissance" and fostering its rapid spread (C. Salmon).

Another aspect embraced by digital storytelling from the mid-1990s onwards was its widespread adoption as a participatory method, aimed at enabling people from different backgrounds to create and share short audiovisual stories. This approach has been used, for instance, to promote digital literacy and creativity in educational settings as in Schleser, 2012, as a support tool in social work as in Lenette, Cox, & Brough, 2015, and to encourage knowledge exchange between generations in Indigenous communities as in Edmonds, 2014. The term digital storytelling can encompass various forms, but it generally refers to the creation and sharing of stories through digital tools. However, it is often used to denote a specific process that results in a five-minute audiovisual clip, combining photographs, voiceover narration, and other audio elements

as in Lambert, 2009, initially applied for artistic, therapeutic, or community development purposes as in de Jager et al., 2017.

In the context of community research, digital storytelling has been particularly appreciated for actively engaging marginalized communities, allowing them to tell their own stories as in Schleser, 2014 and Gubrium, Fiddian-Green, & Hill, 2016. These projects are often seen as participatory processes, giving storytellers the opportunity to create their own narratives independently.

As co-creators, Waycott et al., 2017 define facilitators who act as mediators in the process of constructing meaning within digital stories. Additionally, various stakeholders may be involved, especially in digital storytelling projects that include community development components or advocacy activities; this makes the participation in the design of such stories a complex and layered process. Waycott et al., 2017 also specified that, nevertheless, the primary goal of these projects is often to give a voice to individuals who would otherwise be excluded or marginalized.

A significant strength of digital storytelling in this context is its inherent versatility; in other words, the visual arts-based approach allows participants to choose the story they want to tell, decide how to narrate it, and select the content that best represents their experience. For example, storytellers can use elements such as photographs, music, footage, and alternative storytelling methods (like voiceover, written text, or postcards). This flexibility enables them to share both everyday experiences and intensely emotional and subjective moments.

The ability of digital storytelling to connect the storyteller with their audience is considered one of its most relevant qualities according to Gubrium, Krause, & Jernigan, 2014 and LaMarre & Rice, 2016 works. This aspect is perhaps one of the main reasons why it has been chosen as an ideal medium to give voice to the experiences of individuals from diverse or marginalized communities.

### **Evolution of Digital Storytelling**

There are many other terms to describe this practice, such as digital documentaries, computer-based narratives, electronic memoirs, and interactive storytelling, but they generally revolve around the idea of telling stories with various multimedia, including graphics, audio, video, and web publishing.

Technological evolution has opened new possibilities for telling and sharing stories through different types of multimedia files. Thanks to the Internet, today anyone has the tools and platforms

to become a digital storyteller and easily share their stories. Digital storytelling involves creating a harmonious blend of text, graphics, audio narration, video, and music, with the goal of presenting information on a specific topic. Similar to traditional storytelling, digital stories also revolve around a specific theme, which can be chosen or suggested, and always originate from a subjective perspective.

As already highlighted, there are numerous definitions of digital storytelling in both popular and academic literature, and the term has often been used quite flexibly, encompassing a wide range of products. For this reason, it is useful to refer to the definitions developed by the Center for Digital Storytelling (CDS) in Berkeley, California. According to Joe Lambert, founder of the CDS, this form of storytelling that integrates new technologies is structured around seven fundamental elements:

- 1. Point of view: the story always starts from the subjective perspective of the author.
- 2. A dramatic question: a question or problem is introduced, which will be answered by the end of the story.
- 3. Emotional content: the author uses emotions as a tool to present and address the issues narrated.
- 4. The gift of voice: the narration is expressed in the author's voice, adding a personal touch and facilitating audience understanding.
- 5. The power of soundtrack: the chosen music or sounds support the atmosphere and tone of the story.
- 6. Economy: the narration is short and concise; the author balances information without overwhelming the viewer.
- 7. Pacing: the author determines the speed of the narration, which can be slow or more dynamic, depending on the message being conveyed.

These elements form the foundation for creating effective and engaging digital stories, integrating various available media in the best possible way. Storytelling allows us to bring our reality closer to the audience, fostering a sense of belonging and trust, and thus expanding retaining loyal customer base. or We tell stories to make sense of our chaotic everyday experiences and to make our voices heard where they want to be silenced. What does it really mean to tell a story through different media, and under what conditions is it desirable?

Nowadays, digital media has become an integral part of everyday life. For example, consider how photography has changed over time. Just a few decades ago, it was a privilege to afford a photographer to take a family portrait, for which one had to pose, with a serious expression to convey its importance, and wear one's best clothes for the occasion. Now, photography has become a form of communication: we send photos instantly through messaging apps (like WhatsApp, or Messanger) to express our emotions at a given moment, show what we are wearing, or even just remind ourselves of something we need to do.

Let us take a moment to reflect on how many other forms Digital Storytelling has evolved into: all types of social media like Instagram, Facebook, Snapchat, and many others, through which people post photos and videos of their daily experiences. Or even video résumés to talk about oneself and one's work experiences; video montages to capture in real-time what is happening in the world or simply to tell a story spontaneously and in one's own words.

Let's consider social media as an example, which is used by billions of people daily to express emotions, share experiences with those around them, but also to transmit messages and give voice to issues that are not heard enough. In recent decades, the world of social media has evolved radically, and its power has become increasingly greater.

The first thing that comes to mind when thinking about social media is precisely digital content like photos, videos, and everything shared through them. But the real power of social media lies primarily in its ability to connect people through digital platforms, and to connect them over long distances. This type of connection has allowed people to feel less lonely, to feel part of a global common framework; over time, this has taken shape, and today one can join many virtual groups, associations, and communities, all through a simple click.

This is exactly what is happening every day in terms of sustainability and intercultural exchange: people exchange opinions and thoughts digitally in all forms—via Skype, Zoom, social media—not only to find comfort in addressing these issues but above all to find common solutions, to make themselves heard more and more by the global entities responsible for these matters.

A virtual association I want to use as an example is one I took part in during my university journey, Clivex: *Climate Virtual Exchange*. The Clivex project is committed to connecting diverse realities and cultures around the world and uniting them under a common goal: protecting the planet and the populations most affected by climate change. The theme addressed in the project was, in fact, Climate Injustice: a very complex topic through which I learned that behind the climate problem, there is much more than what is commonly thought and what is shared in public media, as many things are kept silent/hidden or omitted altogether. And I learned this precisely thanks to the encounters and connections I developed during

those months with my companions from all over the world, through a screen. Companions from Egypt, Palestine, the Canary Islands, Lebanon, the Netherlands, and Germany.

I will address the topic of climate injustice in more detail in the following chapters, as I will focus the characteristics of Digital use current chapter to on Storytelling. In addition to the interpersonal development of digital storytelling, we have also seen an evolution in portable and mobile devices, such as smartphones and tablets, which have opened new possibilities for digital storytellers. Until recently, very few documentary formats lent themselves to framing and analyzing bottom-up approaches. However, with the increased accessibility and quality of smartphones and apps dedicated to filmmaking and digital storytelling, many filmmakers, designers, and creatives have begun using digital storytelling and "mobile-mentaries" that is, the creation of documentaries through mobile devices as a means to express political positions and give voice to various communities. Digital storytelling through mobile devices offers great potential for communities, allowing them to use individually or communally owned mobile technologies, put into practice newly acquired skills, and take advantage of free applications like Adobe Clip or Adobe Spark Video. They can also follow templates made available by Schleser on YouTube (Schleser, 2015) to design, develop, and create their own digital stories.

An issue unknown to most of the world (especially in the northern hemisphere) is the difficulty marginalized populations face due to limited access to the Internet, modern, advanced technologies, and therefore digital storytelling. As Jenkins addresses, the focus needs to shift to access to digital spaces, to the opportunities to participate; thus, it is necessary to develop cultural competencies to facilitate this process. Jenkins considers these new media literacies as essential social skills of the 21st century (Jenkins, 2009).

The beauty of the Digital Storytelling methodology lies in its simplicity and versatility, and be effectively adapted in it can to each group and situation. Digital Storytelling is a powerful tool for raising awareness about environmental sustainability, as it combines narrative and digital technologies to communicate complex messages in an engaging and accessible way. Its strength is precisely in not being limited to just one person or local group; rather, with a single action, it can bring together different realities, countries, and cultures around the world at the same time.

Not only does it use images, videos, graphics, and personal testimonies to highlight environmental challenges like climate change, pollution, biodiversity loss, and the sustainable management of resources, but it also emphasizes the social problems caused as a result of these issues. This creates a global connection of voices, ideas, and opinions, coming together to seek alternative solutions to these daily injustices and to amplify their voice.

Some of the ways in which Digital Storytelling is used to raise awareness on sustainability and interculturality include:

- Personal stories and testimonies: Telling the stories of individuals or communities directly affected by environmental issues, such as desertification or rising sea levels, makes these problems more tangible and humanizes the statistics. This type of narrative emotionally engages the audience, encouraging them to reflect and take a stand.
- Digital documentaries and mobile-mentaries: The creation of documentaries through mobile devices allows filmmakers and activists to tell real-time stories, showing the impact of environmental policies or natural disasters on both small and large scales. These tools help spread global messages, even in geographically or socially marginalized areas.
- Awareness campaigns on social media: Through platforms like Instagram, Facebook, and YouTube, environmental organizations and individuals can share visual stories that inspire concrete actions. Photos and videos showcasing the beauty of nature and the damage caused by humans can quickly raise awareness among a wide audience. Additionally, social media fosters active participation, not only allowing people to share stories, experiences, and ideas to promote a more sustainable lifestyle, but also creating groups for ecosystem preservation and environmental associations.
- Interactive stories and educational games: By using interactive digital storytelling, such as games or educational apps, key sustainability concepts can be taught to younger generations. These tools directly engage users, encouraging them to reflect on their choices and the consequences of their actions on the environment.
- Global collaboration: Through digital platforms, people from different cultures and countries can connect and share innovative solutions to address global environmental issues.
   Projects like the Climate Virtual Exchange (Clivex) enable the exchange of ideas and best practices among international communities, contributing to a global approach to sustainability.

The main strength of Digital Storytelling lies in making complex topics related to environmental sustainability accessible to everyone, while also stimulating empathy and action. It creates a sense of urgency and belonging to a common cause, encouraging people to reflect on how their daily actions can contribute to a more sustainable future.



Picture of young activists who are making a difference: Climate change in the Middle East

#### 1.3 The Narrative Turn

The turn toward narrativism in the social sciences in the mid-1990s coincided with the explosion of the Internet and advancements in new ICTs, creating the conditions for a "resurrection of storytelling" and enabling its rapid dissemination. Popularized through effective lobbying by the new power players, the management of storytelling is now considered essential for decision-makers. Whether you aim to close a successful deal, persuade a rival faction to sign a peace treaty, launch a new product, convince your team to embrace significant changes, design a "serious" video game, or help a GI suffering from post-conflict trauma, storytelling is seen as a panacea.

The rise of storytelling, however, seems to have led to a victory of sorts, trivializing the very concept of storytelling itself, blurring the lines between true stories and simple tales, between eyewitness accounts and fiction, between spontaneous narratives and structured ones. This may have caused a deliberate confusion among annual reports. From Homer to Tolstoy, from Sophocles to Shakespeare, the great stories that shaped human history recount universal myths and teach lessons for past generations. Storytelling, on the other hand, goes in the opposite direction. We paste artificial narratives onto reality, obstructing interaction and saturating symbolic spaces with them.

Building a story is a highly complex task. Before finding the right story, you need to take a closer look at yourself - not just your company but the people who shape it - and decipher which emotional threads connect you to potential clients or users of your content. Translation: storytelling does not come out of nowhere in five minutes. We need the fundamentals: a vision, a mission, a strong differentiating element, and a "why" for what we do. The complexity of this reflective

process is the main reason why the largest international brands have managed to produce intricate content such as storytelling in their advertising videos.

The "narrative turn" of the 1990s arose from the simple discovery by management researchers that companies are microcosms where many stories are created and circulate. But storytelling is also a central part of business activity, from client visit reports to job interviews. "Storytelling management" is nothing more than the attempt to control how these stories evolve.

New management techniques rely less on procedures or mechanisms involving objects and more on people and how they use resources requiring their physical presence, emotions, gestures, voice, and so on. Adaptability is, in fact, a key requirement for navigating networks, ensuring the ability to transit through the heterogeneity of being minimally defined by a body and its corresponding noun. Neo-management has developed mechanisms based on consensus and agreement that can achieve their goals only by merging with forms possessing the typical traits of an authenticity grammar: spontaneous and friendly relationships; trust; requests for help or advice; attention to illness or suffering; friendship, and even love. Those involved in these mechanisms cannot categorically refuse to participate in such exchanges.

### **Digital Storytelling in Postdigital Condition**

Digital Storytelling represents one of the most significant narrative expressions of the contemporary era, where the convergence between the digital and non-digital is redefining how we tell, share, and interpret stories. In the context of the postdigital condition, as analyzed by Spencer Jordan, the dichotomy between what is digital and what is not dissolves, leading to a fluid hybridization that intertwines the two domains dynamically and creatively. This condition reflects an epistemological shift: the digital is no longer merely a tool or platform but a pervasive element reshaping the boundaries of human experience.

Postdigital storytelling is transmedia and participatory, embracing formats that span from social media to web platforms, virtual reality, and augmented reality. Narration becomes an immersive experience where the audience actively interacts with the content. Iconic examples include works like *The Cartographer's Confessions* by James Attlee, which employs digital maps and locative storytelling, or *Twitterature* projects such as Jennifer Egan's *The Black Box*, leveraging the dynamics of social media to create serial storytelling formats. These experiences demonstrate how storytelling has evolved into a collaborative process where the author, the reader, and the medium all participate in constructing the story. In the postdigital condition, however, not all is without challenges. The boundary between authentic storytelling and manipulation becomes

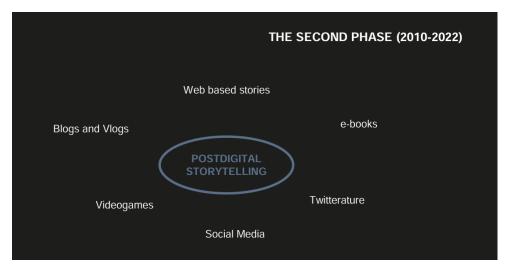
increasingly blurred, particularly within the context of the "society of the spectacle" described by Guy Debord, where images and stories become tools for mediating social relationships. This phenomenon is evident in marketing, where storytelling is often used to sell products, transforming experiences into mere tools of consumption. While this approach can create strong emotional connections with the audience, it risks reducing storytelling to a purely functional element devoid of depth and authentic meaning.

Another critical aspect of Digital Storytelling in the postdigital condition is the ethical dimension. Creativity, as Jordan asserts, is inherently situated and political, influenced by social and cultural dynamics. Digital storytelling, therefore, should not merely entertain but also challenge and question existing conventions, offering new ways of thinking and interacting with the world. Projects like *Sea Prayer* by Khaled Hosseini, which uses virtual reality to raise awareness of humanitarian crises, demonstrate how storytelling can be a powerful tool for promoting social change.

The postdigital condition calls for a reconsideration of the author, the medium, and the audience. In an increasingly hybrid world, where the boundaries between digital and non-digital are blurred, storytelling is no longer a unidirectional act. It becomes an interactive and multimodal process requiring new skills and sensitivities. From this perspective, Digital Storytelling is not just a means of telling stories but a way to navigate the complexity of the contemporary world, making visible the connections and possibilities that might otherwise remain hidden.

Digital Storytelling in the postdigital condition represents a field of extraordinary innovation but also a terrain of challenge. It demands critical reflection on the nature of stories, the role of technology, and the ethical implications of our narratives. Only by balancing authenticity, creativity, and responsibility can we fully harness the potential of storytelling to transform not only how we narrate but also how we understand and live in the world.

Postdigital refers to the condition where this binary divide between digitality and non-digitality is no longer representative of how we actually experience our lives. Instead, postdigital offers a new kind of epistemological mash-up, a hybridised approach towards the digital and the non-digital, finding characteristics of one within the other. (Spencer Jordan, 2021)



Spencer Jordan, Postdigital Storytelling, 2021

### Electronic Literature and Digital Storytelling: an intrinsic connection in the Digital Age

Electronic literature represents an innovative realm of contemporary cultural production, where texts, images, sounds, and interactions merge into a narrative experience enabled by digital technology. This term refers to works conceived, distributed, and consumed through digital platforms, in which code, interactivity, and multimedia are integral to the text itself. It is not a simple transposition of traditional literary works into digital format but a literary form that exists solely thanks to digital technologies.

Electronic literature is closely connected to Digital Storytelling, as both practices explore the narrative potential of the digital medium. While Digital Storytelling focuses on storytelling through various digital means, from virtual reality to social media, electronic literature expands the boundaries of traditional narrative through the use of interactive interfaces, hypertexts, and algorithms. This connection is evident in both forms' ability to integrate the reader as an active participant, breaking the traditional distinction between author and audience.

As explored in *Electronic Literature* by N. Katherine Hayles, the field of electronic literature encompasses stories, poems, and experiments using digital devices and computers. Hayles examines the unique characteristics of this literary form and considers how digital technologies influence the creation, distribution, and reception of literary works. The theoretical and cultural implications of electronic literature challenge traditional notions of text, author, audience, and narrative. This context opens a field of inquiry, positioning electronic literature as both a participant in the literary tradition and a catalyst for significant transformations that redefine what literature is.

In *Electronic Literature*, N. Katherine Hayles undertakes a fascinating exploration of the dynamic space where technology and literature converge. This groundbreaking work illuminates the diverse landscape of electronic literature and serves as a comprehensive guide for analyzing its influence on contemporary literary theory and practice.

At the heart of the research on advances in digital technology lies the question of how these are transforming the understanding and experience of literature. Through the analysis of various forms of electronic literature, from hypertext to interactive storytelling, the transformative power of digital media and their ability to redefine the boundaries of narrative become evident. A key insight in this field is the concept of "media-specific analysis," which examines the unique opportunities and limitations of digital platforms. This approach emphasizes the importance of adapting literary criticism to the complexities of electronic literature, recognizing the innovative potential of digital media and the need for nuanced analysis and interpretation of these new forms of expression. Moreover, electronic literature represents an invitation to embrace its interdisciplinary nature. It exists at the intersection of literature, technology, and culture, highlighting the symbiotic relationship between these domains. Through interdisciplinary dialogue and collaboration, electronic literature can thrive as a constantly evolving field, enriching the cultural landscape with new modes of storytelling and creativity.

Beyond its academic contributions, *Electronic Literature* also offers profound insights into broader sociocultural phenomena. By interrogating themes of authorship, agency, and reader participation in the digital age, it sheds light on the profound transformations taking place in contemporary literary practices. From collaborative storytelling projects to algorithmic literature, the book illuminates the evolving roles of authors and readers in the co-creation of narratives within networked environments. Additionally, electronic literature invites scholars and practitioners to embrace its interdisciplinary nature. Hayles skillfully navigates the intersection of literature, technology, and culture, underscoring the symbiotic relationship between these realms. Through interdisciplinary dialogue and collaboration, electronic literature can flourish as a vibrant and evolving field, enriching our cultural landscape with new forms of storytelling and creativity.

The ethical and aesthetic complexities inherent in electronic literature are skillfully addressed. As digital technologies continue to shape how we communicate and express ourselves, the authors urge us to consider the ethical implications of algorithmic curation, data surveillance, and the commercialization of creativity. By addressing these pressing issues, electronic literature invites us to think critically about the sociopolitical dimensions of digital culture, imagining ethical frameworks that protect artistic integrity and human agency.

"Electronic Literature" by N.K. Hayles is a groundbreaking work that not only outlines the contours of electronic literature but also points to its future development. Through detailed analysis, interdisciplinary approaches, and ethical inquiry, this book provides a compelling vision of electronic literature as a dynamic and transformative force within contemporary culture. As we navigate the ever-evolving landscape of digital media, Hayles' work serves as an essential guide, inspiring us to embrace the creative possibilities and ethical responsibilities of electronic literature in the digital age.

Defining electronic literature is challenging, emphasizing its diversity and rapidly evolving nature. Electronic literature is described as literary works with significant digital elements, encompassing a wide range of formats such as hypertext fiction, kinetic poetry, interactive storytelling, and generative art.

One of the main characteristics of electronic literature is its reliance on computational processes. Unlike traditional printed documents, which are fixed and immutable, electronic documents often feature dynamic and interactive elements shaped by algorithms and user input. This dynamic nature challenges traditional notions of authorship and textuality, blurring the boundaries between author, reader, and text.

Materiality also plays a crucial role in electronic literature, particularly the role of hardware and software in shaping the reader's experience. Electronic literature is closely intertwined with its technological background, and its meaning is deeply tied to its material embodiment. This emphasis on materiality distinguishes electronic literature from print literature and underscores its status as a distinct literary form.

A nuanced understanding of electronic literature is necessary, taking into account its technical, aesthetic, and cultural dimensions. It encourages scholars and readers to approach electronic literature with an open mind and to recognize its potential to expand our understanding of literature and literary practice. The relevance of electronic literature in the context of Digital Storytelling also lies in its ability to address ethical, political, and cultural issues. Both practices not only narrate stories but also pose questions about the human condition in the digital age. Through the use of technology, they explore themes such as identity, memory, and the relationship between humans and machines, offering a critical perspective on the dynamics of the contemporary world.

In conclusion, electronic literature and Digital Storytelling share goals and tools, representing two sides of the same coin. Both practices demonstrate how the digital is not merely a medium of transmission but a transformative force that redefines how we tell and experience stories. Their synergy represents not only a creative opportunity but also an intellectual challenge to understand the role of storytelling in the age of technology.

The multimodality of digital art works challenges writers, users, and critics to bring together diverse expertise and interpretive traditions so that the aesthetics and possibilities of electronic literature may be fully understood. (N. K. Hayles, 2008, p.30)

### Convergence Culture: Where Old and New Media Collide

Convergence in digital storytelling refers to the process of integrating and interacting with various media and digital platforms to create a coherent transmedia storytelling experience. This concept, extensively analyzed by Henry Jenkins in his theory of convergence culture, represents a significant shift in how stories are conceived, distributed, and consumed in the digital age.

In the context of convergence, stories are not longer confined to a single medium or format. Instead, they are distributed across multiple platforms, each uniquely contributing to the overall narrative. For example, a story might begin as a film, evolve through a video game, and be further enriched by interactive content on social media or an app. This approach allows users to immerse themselves in a rich narrative ecosystem where every medium adds new perspectives and details.

Convergence is not just a technological phenomenon but also a cultural one. This means greater user engagement, where audiences become active agents shaping and expanding the story rather than passive spectators. This engagement manifests through user-generated content such as fan fiction, comments, and remixes, which can influence the development of the original story.

In digital storytelling, convergence enables creators to leverage the unique characteristics of each medium. For instance, social media can provide quick and interactive updates, apps can offer personalized and immersive experiences, and video games allow users to engage in direct and dynamic exploration of the story. This integration enriches the narrative, transforming it into a multisensory and participatory experience. However, convergence also brings significant challenges. Fragmentation of content across multiple platforms can make it difficult to follow the entire story, leading to mixed experiences between users who access all components and those who explore only parts. Additionally, sophisticated narrative planning is required to ensure that the various parts of the story harmonize and complement each other meaningfully. Thus, convergence in digital storytelling represents a revolution in how stories are created and shared. It harnesses the potential of technology and participatory culture to deliver deeper and more engaging stories, redefining the relationship between creators, media, and audiences.

Jenkins provides an illustrative example in his text, analyzing the controversy surrounding Dino Ignacio, a high school student who created a series of images titled "Bert is Evil." These

images depicted Bert, a character from *Sesame Street*, interacting with various controversial figures, including Osama Bin Laden. These images circulated online, and one was used during anti-American protests following the September 11 attacks. The Children's Television Workshop, creators of *Sesame Street*, threatened legal action. The incident sparked discussions about media convergence, participatory culture, and collective intelligence, highlighting the power of consumers to shape and distribute media content. This example explores how media circulate across platforms and boundaries, emphasizing the role of active consumer participation in shaping modern media culture. Convergence occurs not only through technology but also through individual interpretation and social interaction, fostering collective intelligence and potentially influencing various aspects of society.

Another relevant example involves a Bollywood film streamed via mobile phones, illustrating the growing centrality of mobile devices in media distribution. The author reflects on their personal experience of wanting a simple phone for calls amidst the dominance of multifunctional smartphones in the market. The historical context of convergence is further examined, contrasting the expectations of a digital revolution in the 1990s with the reality of today's complex interactions between old and new media. Industry leaders' engagement with convergence and its implications for the future of entertainment is explored. The New Orleans Media Experience serves as a microcosm of this discussion, where participants grapple with the evolving media landscape, some with skepticism and others with optimism or opportunism. Overall, the questions raised pertain to the nature of convergence and its impact on media consumption, production, and culture.

Within the media industry, convergence culture focuses on the discussions and tensions observed during the New Orleans Media Experience. Participants from advertising, entertainment, and technology sectors gather to address the challenges and opportunities of media convergence. A sense of urgency and uncertainty pervades as industry leaders confront the pace of change and the need for collaboration. The event serves as a platform for exchanging ideas and addressing common issues, such as expanding the use of gaming consoles and managing partnerships between different media forms.

The dynamics between traditional media and emerging platforms, such as video games and mobile devices, are particularly highlighted, showcasing the complexities of adapting to new modes of storytelling and distribution. Additionally, changes in the music industry landscape are acknowledged, with discussions on monetization strategies and the potential of cross-media promotion.

In essence, convergence is inevitable. Along with it come challenges and the need for cooperation among stakeholders to navigate the evolving media landscape successfully.

Let us consider Ithiel de Sola Pool (The Prophet of Convergence) as a key figure in understanding media convergence, drawing a parallel between him and Marshall McLuhan for their influence on the digital revolution. Pool's work, particularly *Technologies of Freedom*, is highlighted for its early exploration of convergence as a force reshaping the media industries. Pool describes convergence as a process that blurs the distinctions between various forms of media, driven by technological advances and shifts in corporate ownership structures. He emphasizes the importance of media decentralization in promoting freedom, contrasting centralized control with decentralized access.

This narrative reflects Pool's anticipation of a prolonged transitional period characterized by competition and cooperation among different media systems. It underscores the complex and dynamic nature of convergence, challenging assumptions about the inevitability of technological change. This allows us to reflect on the current era of media transformation, marked by uncertainty and conflicting interests.

The author's goal is to provide insights into how convergence is reshaping pop culture and the relationships between audiences, producers, and media content. Through a series of case studies, the authors aim to reveal the impact of convergence on various sectors and consumer perspectives. However, the author acknowledges the possibility of biases stemming from personal experience and involvement in the media environment. Overall, this text serves as an invitation to understand and engage in dialogue about the impact of convergence on media consumption and production. It highlights the importance of involving audiences in discussions that will shape our future relationship with media.

#### **Media Convergence**

Media convergence carries significant cultural implications, illustrating how it influences various aspects of daily life and social dynamics. Convergence is not merely a corporate-driven process but also a grassroots phenomenon shaped by individuals' interactions with media.

One example is the way mobile technologies have transformed interpersonal relationships, introducing concepts like "telecocooning," where individuals maintain constant contact despite physical distance. This highlights how convergence extends beyond commercially produced content to include personal experiences and social interactions across multiple media platforms.

Furthermore, convergence recognizes its potential for both creativity and misuse: it is currently more of an improvised arrangement, with cultural shifts, legal battles, and economic consolidations often preceding advances in technological infrastructure. Tensions exist between the expansion of media opportunities enabled by new technologies and the concentration of media ownership among a few conglomerates. Consumers are becoming more active and interconnected, challenging traditional assumptions about media consumption and production.

Convergence reshapes the relationship between media producers and consumers, emphasizing its multifaceted nature and profound impact on contemporary society, industrial dynamics, and individual experiences with media. The nature of convergence culture is transformative, with far-reaching implications for various aspects of society, including education, media reform, and democratic citizenship. It is crucial to understand the contrasting ideas about participation that shape this new media landscape.

Another equally important aspect is the role of "early adopters," who disproportionately influence media culture through their access to new technologies and mastery of relevant skills.

Early adopters are individuals or groups who embrace new technologies, products, or ideas before they reach mass adoption. This term, originating from Everett Rogers' diffusion of innovations model, describes the second segment of the population to experiment with novelties, following innovators. Early adopters are critical to the success of new technologies or inn ovations as they serve as a bridge between pioneers and the broader market. Early adopters play a fundamental role in the lifecycle of an innovation:

- **Initial feedback:** They provide valuable insights to producers or creators to improve and optimize the product.
- **Promotion and diffusion:** Their adoption serves as social proof of the product's validity or utility, influencing the broader audience to follow suit.
- Market validation: Their approval can confirm the commercial viability of an innovation.
- Let us analyse some examples of Early adopters:
  - **Digital technologies:** Users who purchased early smartphones or began using platforms like Facebook or Twitter during their nascent stages.
  - **Software and apps:** Individuals who test new applications or software during beta phases, providing reviews and suggestions.
  - **Sustainability:** People who adopt solutions such as electric vehicles or renewable energy systems early on, driving the ecological transition.

In the context of digital storytelling, early adopters are often the first to experiment with new platforms or narrative formats, such as virtual reality, interactive chatbots, or locative narratives.

They help test the effectiveness of these innovations and promote them to the broader public, contributing to their wider adoption. Attracting and engaging early adopters is essential for the success of new digital storytelling experiences. However, there is also a need to expand access and participation to include a more diverse range of individuals.

Convergence culture is characterized by its complexity and contradictions; there is no single solution. Instead, society must continuously negotiate and adapt as it navigates the challenges and opportunities presented by media convergence. In essence, convergence culture is an ongoing process of transformation in which both producers and consumers must adapt to new dynamics and redefine their relationships with one another. The struggles and compromises arising from these interactions will ultimately shape the public culture of the future.

The distinction between media and transmission systems is essential for understanding the evolution of media environments. While transmission technologies may become obsolete, media themselves do not disappear; instead, they evolve, adapting to new contexts. A medium is not merely a communication technology but also a set of cultural practices that develop around that technology. This explains how traditional media, such as radio and print, coexist with television and digital media rather than being supplanted by them.

The concept of the Black Box Fallacy challenges the simplistic view that all media content could converge into a single device. Reality, however, reveals a more complex landscape, characterized by a proliferation of specialized multimedia devices alongside generic platforms. Convergence is not merely a technological shift; it also transforms the relationships between technologies, industries, markets, genres, and audiences, affecting both the production and consumption of media. This process is not an isolated event but an ongoing dynamic, where media consumption becomes increasingly fragmented and multitasking. For instance, it is common to juggle multiple windows on a screen while engaging in activities like homework or participating in online fan communities.

Convergence is not just a matter of tools but a profound transformation of media practices and relationships. Understanding it requires recognizing the complexity of contemporary ecosystems, where technologies and cultures continuously intertwine, redefining the boundaries of media consumption and production.

The combined forces of technology and human nature will ultimately take a stronger hand in plurality than any laws Congress can invent. (Henry Jenkins, 2006, p.5)

## Transmedia Narratology and Transmedia Storytelling

Storytelling alone can no longer explain the series of shocks characterizing today's media landscape. We move from story to conflict, from suspense to panic, from sequentiality to a series of timeless shocks. Life is no longer orderly; it does not follow any narrative arc and is instead disrupted by shocks. Some individuals may appear to be journalists, but they do not practice journalism. It is not journalism because it does not regard the reader as a master to serve. Instead, it observes its audience with cold, cynical eyes. In this domain of pseudo-journalism, audiences can be manipulated.

With the proliferation of the internet, cable television, and the rise of blogs that function as antennas for viral marketing, propaganda efforts are no longer aimed at socio-professional categories, market shares, or populations. Instead, they target high-contagion factors, focusing on specific places and environments.

What does it really mean to tell a story through different media and under what conditions is it desirable? (Marie-Laure Ryan, 2016, p.1)

The concepts of transmedia narratology and transmedia storytelling, explored by Marie-Laure Ryan, delve into the interconnected relationship between narrative structures and the multi-platform approach to storytelling. This narrative approach transcends traditional boundaries, dispersing narrative elements across various media platforms, such as cinema, television, literature, video games, social media, and more. The idea of transmedia narratology emphasizes studying how narratives unfold and evolve across diverse media channels. It investigates how each medium uniquely contributes to the overall narrative experience and how audiences engage with these different elements to construct a cohesive narrative world.

Transmedia storytelling, on the other hand, refers to the practice of telling a single story or expanding a narrative universe across multiple media platforms. This involves creating complementary content that adds depth and richness to the central narrative, enabling audiences to explore different facets of the story through various media.

The key aspects of transmedia storytelling and narratology include:

• **Story Expansion**: Transmedia narratives often expand the story world beyond the boundaries of a single medium, offering the audience a more immersive and expansive experience.

- Audience Participation: Transmedia storytelling encourages audience participation and engagement, inviting them to explore and interact actively with the various elements of the narrative across multiple platforms.
- Media Synergy: Each medium in a transmedia narrative contributes unique attributes that
  enhance the overall storytelling experience. For example, a story may use cinema for visual
  narration, novels for in-depth character exploration, and video games for interactive
  engagement.
- Canon and Continuity: Maintaining consistency and continuity across various media platforms is crucial in transmedia storytelling to ensure the audience has a cohesive narrative experience.
- Collaborative Creation: Transmedia projects often involve collaboration among creators, writers, artists, and developers from diverse backgrounds to craft a cohesive and engaging story across multiple platforms.

Overall, transmedia narratology and storytelling provide a dynamic approach to the construction and consumption of narratives, enabling greater creativity, audience involvement, and exploration of complex narrative worlds. Through the integration of various media forms, transmedia narratives challenge traditional notions of storytelling and pave the way for innovative and engaging narrative experiences.

Let's explore the three types of discourse surrounding transmedia storytelling:

### 1. Industry Discourse:

Industry discourse revolves around the strategies, marketing tactics, and business models employed by media companies and creators to develop and distribute transmedia content. This discourse often focuses on profit, audience engagement, and brand extension. Key aspects of industry discourse include discussions on multiplatform franchising, intellectual property management, audience segmentation, and monetization strategies. Industry professionals analyze market trends, consumer behavior, and technological advancements to optimize the production and distribution of transmedia narratives. They also explore licensing agreements, merchandising opportunities, and transmedia synergy to maximize the commercial potential of intellectual properties across various media platforms.

#### 2. Fan Discourse:

Fan discourse centers on the reception, interpretation, and appropriation of transmedia narratives by fan communities. Fans actively engage with transmedia content by creating fan

fiction, fan art, fan videos, and participating in online forums and social media discussions to share their interpretations, theories, and speculations about the story world. Fan discourse emphasizes agency, creativity, and the participatory culture of fans, who become co-creators and contribute to the evolution of the narrative universe. Fan communities often develop their own subcultures, rituals, and practices, such as cosplay events, fan conventions, and fan-run websites dedicated to the analysis and celebration of transmedia narratives. Fan discourse also intersects with issues of representation, diversity, and social activism, as fans advocate for more inclusive and authentic representation of characters and stories.

#### 3. Narratological Discourse:

Narratological discourse focuses on the formal and structural aspects of transmedia storytelling, analyzing narrative techniques, conventions, and aesthetics across different media platforms. Scholars and theorists examine how transmedia narratives are constructed, how story elements are distributed and interconnected across multiple media texts, and how audiences interpret and navigate complex narrative environments. Narratological discourse explores concepts such as narrative coherence, world-building, character development, intertextuality, and narrative immersion in transmedia contexts. Scholars draw on established narratological frameworks, such as semiotics, structuralism, and poststructuralism, to analyze the narrative strategies employed in transmedia storytelling. They also investigate the role of medium-specific possibilities and constraints in shaping the narrative experience across various media platforms.

These three types of discourse offer complementary perspectives on transmedia storytelling, highlighting the different ways in which transmedia narratives are produced, consumed, and interpreted in cultural, industrial, and academic contexts.

# **Chapter Two**

# **Causes of Climate Change**

# 2.1 What Is Climate Change?

Climate change refers to the long-term shift in Earth's average temperatures and weather patterns. Over the past decade, the world has been, on average, about 1.2°C warmer than at the end of the 19<sup>th</sup> century. It has now been confirmed that global warming has surpassed 1.5°C over the 12-month period between February 2023 and January 2024. The year 2023 was declared the hottest year on record.

The climate has changed throughout Earth's history, and natural factors, such as El Niño (a significant increase in the surface temperatures of the Pacific Ocean along the coasts of South America), can influence weather for shorter periods, as occurred in 2023. However, natural causes cannot explain the particularly rapid warming observed in the last century, according to the United Nations' Intergovernmental Panel on Climate Change (IPCC). Its long-term climate change has been caused by human activity, primarily the widespread use of fossil fuels—coal, oil, and gas—in homes, factories, and transportation.

When fossil fuels are burned, they release greenhouse gases, primarily carbon dioxide (CO2). This traps additional energy in the atmosphere near Earth's surface, causing the planet to warm. Since the start of the Industrial Revolution—when humans began burning large quantities of fossil fuels—the amount of CO2 in the atmosphere has increased by about 50%, externally. The CO2 released from burning fossil fuels has a distinctive chemical fingerprint that matches the type increasingly found in the atmosphere.

A global average temperature increase of 1.2°C may not seem significant. However, it has had a huge impact on the environment, including:

- More frequent and intense extreme weather events, such as heatwaves and heavy rainfall;
- Fast-melting glaciers and ice sheets, contributing to rising sea levels;
- Severe declines in Arctic sea ice:
- Warming of the oceans.

But that is not all, as the lives of people are also changing, as we will see further in this chapter. As average temperatures rise, the impacts of climate change worsen. While science is not entirely certain, the consequences of a 2°C increase in global warming compared to 1.5°C could include:

- Extreme hot days would be, on average, 4°C warmer in mid-latitudes (regions outside the poles and tropics) compared to 3°C at 1.5°C;
- Sea level rise would be 0.1 meters higher than at 1.5°C, exposing up to 10 million people to more frequent flooding events;
- More than 99% of coral reefs would be lost, compared to 70-90% at 1.5°C;
- The number of plants and vertebrates (animals with a backbone) exposed to unsuitable climatic conditions would double, affecting more than half of their geographic range;
- Several hundred million people may be exposed to climate-related risks and vulnerable to poverty by 2050 at 2°C, compared to 1.5°C.

The decision to limit temperature rise to 1.5°C was partially designed to avoid crossing so-called "tipping points" (a critical threshold that, when crossed, leads to large, accelerating and often irreversible changes in the climate system). Once these thresholds are surpassed, changes may accelerate and become irreversible, such as the collapse of the Greenland glacier. However, it is unclear exactly where these thresholds lie.

According to the IPCC, between 3.3 and 3.6 billion people are highly vulnerable to climate change. It is expected that people living in poorer countries will suffer the most because they have fewer resources to adapt. This has raised questions about equity, as these areas are typically responsible for only a small percentage of greenhouse gas emissions. However, the repercussions could be felt by broader sectors. For instance, crop failures linked to extreme weather conditions could increase global food prices.

This is why we talk about climate justice. It is important to address this issue because it compels the international community and the main perpetrators of the climate crisis to collaborate and support those who are bearing its weight. These are the most systemic issues that are the root cause of this crisis and many others. The problem lies in an economic model based on extractivism and greed, which is causing a global crisis and exacerbating social injustice worldwide.

#### Anthropocene

The Anthropocene is not merely a geological period but a proposal for a geological era. This is the Anthropocene, or rather, the era in which we live. It is an era in which humans and their activities

have succeeded and continue to influence geological processes at territorial, tectonic, and climatic levels.

What is the Anthropocene?

The Anthropocene is humanity's era, a geological epoch in which human influence outweighs other environmental factors. Indeed, the history of Earth's 4.5 billion years is divided into eons, which are further subdivided into eras, periods, and epochs. The International Commission on Stratigraphy classifies the era we live in as the Holocene (Late Quaternary period of the Cenozoic era), which began at the end of Earth's last Ice Age (the Würm Ice Age) around 11,500 years ago. While all of human history (starting from the introduction of agriculture) occurred during the Holocene, a separate era has emerged called the Anthropocene, during which humans have completely transformed the Earth and had a decisive impact on the global ecosystem, leading to its renaming.

The meaning of the Anthropocene lies in its very origins. The term is composed of the Greek words "human" "and "new," and it derives from the English word "Anthropocene," popularized by Paul J. Crutzen, Nobel laureate in atmospheric chemistry. Regarding this definition, the first scholar to propose it was the geologist Antonio Stoppani, who, in 1873, wrote that human activities constitute the new fertility of the soil, referring to it as the "age of life."

In 1992, Andrew Revkin hypothesized that we might enter a new geological epoch called the "Anthropocene." The term was coined in the 1980s by wildlife biologist Eugene F. Stormer and was developed by Nobel laureate Paul Crutzen and Stormer himself. It was officially adopted at the 2000 IGBP conference. In 2000, they proposed the adoption of the term "Anthropocene" in its current meaning in the newsletter of the International Geosphere-Biosphere Programme.

Regarding the scientific definition of the Anthropocene, many scientists propose moving beyond discipline-specific definitions and instead considering changes in the Earth's system as a whole. Indeed, the Anthropocene refers to the current geological epoch in which the global environment, in all its physical, chemical, and biological properties, is strongly influenced locally and globally, especially by the effects of human activities on a global scale. It refers to the increase in the concentration of CO2 and CH4 in the atmosphere.

When will the Anthropocene begin? For years, geologists, stratigraphers, scientists, and climatologists have debated when the Holocene ends. The Holocene began 11,000 years ago and "ended" with the advent of the Anthropocene. Although the scientific community now agrees on the existence of an epoch characterized by geological impacts caused by human activity, various proposals are being considered to determine the beginning of this epoch.

What has changed? Since its emergence, the Homo sapiens species has altered the overall balance of ecosystems, but these changes initially had minimal impact on Earth. However, over the centuries, accelerations have occurred, with some noticeable features in geological deposits. Domestication of fire through large-scale burning. Domestication of plants and animals. Industrialization. Atomic experimentation. What is certain is that the extinction of numerous species due to the effects of climate change, soil erosion, ocean warming, and even human activities is now evident. We can also add that this is giving rise to new diseases such as sun sickness and environmental anxiety, which afflict our generation.

Evidence of human presence on Earth is, in fact, written on the Earth itself. According to scientists, the Anthropocene, which began in the mid-20th century, is characterized by impacts on rocks and terrestrial deposits that will remain visible for millions of years. This is demonstrated by a study published in the journal Science. Nuclear explosions: 2,421 atomic bombs have been detonated since the first nuclear test at the Manhattan Project in New Mexico on July 16, 1945. Tests and bombs deposit radioactive isotopes in nearby areas - unstable atoms that leave a radioactive imprint on Earth (although in recent years, secure sites have been created for nuclear waste storage). Fossil fuels: From 1850 to the present, atmospheric CO2 concentrations have skyrocketed, reaching a record of 400 ppm. Global CO2 emissions will leave traces in Antarctic ice, plants, sandstone deposits, fossilized bones, and shells that may be found long after we are gone. Mass extinction: According to some theories, we are on the brink of the sixth mass extinction, which in the coming centuries will wipe out three-quarters of terrestrial species. New materials: Aluminum, cement, and plastic are the most commonly used materials in human society. In 150 years, approximately 500 million tons have been produced, and today, the production of concrete has reached 1 kilogram per square meter of land. As for plastic, we produce 500 million tons annually, and there is now a plastic island in the Great Pacific Garbage Patch. Geological effects: mining activities, deforestation, urbanization, coastal erosion, and large-scale agricultural activities alter Earth's geology, including its rock deposit layers. These effects will remain visible for millions of years. Fertilizers: The massive use of fertilizers has increased excessive phosphorus and nitrogen content in the soil, leaving chemical traces visible for thousands of years. Global warming: Our geological epoch has experienced the most significant climate change induced by humans, with a global temperature increase of 0.6-0.9 degrees Celsius and a greater rise in sea levels. The concept of the Anthropocene has also been addressed in the humanities fields such as philosophy, literature, and art. In academia, this topic is receiving increasing attention through journals, conferences, and reports. Indeed, the Anthropocene raises many questions about life, death, and civilization.

The logics of the Anthropocene refer to a set of principles based on ontologies of exploitation, extermination, and processes of depletion of natural resources. These principles are applied indiscriminately to both organic and inorganic life through a panoply of "technologies of power" that serve the order of things in the Anthropocene, determining who is worthy of benefiting from the extraction of value and being saved from catastrophe and who is expendable. The logics and ontologies of the Anthropocene have provided a foundation for the violence of Western history - with its conceptions of time and progress - and geography, with its borders and naturalized identities, as well as for notions of humanity aimed at differentially including or excluding. Since colonial modernity, the Anthropocene has been based on ontologies that discriminate between human life and non-human life (animal and plant) and non-life (inorganic), as well as on the differential attribution of humanity. Different statuses and values have been assigned based on those constructions of gender, race, sexuality, and class, intersectional constructions of race serving global and local power relations that, though not fixed and versatile, have been sedimented through modernity. Geography, history, and humanity partake in the "common European heritage" that includes "externalization and genocide."

We are in a new era, the Anthropocene (which, as named, might seem like good news, an event to celebrate, but it is not at all). In recent months, the AWG has been working to identify a definitive geological marker, technically called the stratotypic point or Global Stratigraphic Section and Point (GSSP). Currently, there are 9 candidate sites worldwide, each reflecting the significant and undeniable impact of human activity. We must determine which set of rock layers best illustrates this impact and marks its lower temporal boundary—the first trace of epochal change, the boundary, the shock. This point must be chosen to represent a stratigraphic boundary passage, and researchers will mark it with a golden spike.

The data that unmistakably demonstrate humanity's impact on Earth are countless. It is now difficult to find the opposite - untouched sites. Land, water, atmosphere - each system shows the scars of invasive and often destructive activities capable of altering natural balances, such as the climate. Understanding how humans have changed the geology of our territory is important for reasons of awareness and responsibility. Why it important? Witnessing an epochal transition is rarer than rare. The formalization of the Anthropocene and the scientific recognition of the end of the Holocene appear as a fundamental step in increasing efforts to understand and study humanity's influence on Earth's systems. The transition to a new era is a path full of responsibility. And it could (hopefully) also convince decision-makers to finally account for humanity's environmental impact.

The Earth's physical system contains lakes filled with people, cities, and physical actors. Cities are at the heart of global nature, a space where human activities increasingly shape and reshape the material, biological, geological, and physical profile of the Earth. The lifestyles of global humanity and urbanized populations, and life on Gaia, are more interconnected than ever in modern times.

Social, economic, and political history has always linked the process of urbanization with major modern events such as the Industrial Revolution. However, in recent years, social scientists are no longer the only ones interested in the Industrial Revolution. According to some geologists, in fact, our planet has entered a new geological era with the Industrial Revolution. This era, known as the Anthropocene, replaces the Holocene, the last 10,000 years of natural history.

Since the Industrial Revolution, the lifestyles of people have evolved into new geological forces capable of moving and transforming vast amounts of matter unimaginable in previous epochs. While it has always been true that there is no human history that is not also natural history, since the Anthropocene it has become difficult to separate human ways of life from increasingly significant and uncontrollable influences on life. It has been impossible, even for a moment, to separate Gaia and its inhabitants. For the first time in Earth's history, human lifestyles and relationships with other species have become the main active forces in the process of global environmental change, leading to a series of lasting changes at the biological, chemical, geological, and climatic levels. The effects of this soil fertility are drastically altering the Earth's ecosystem. Climate change, the sixth mass extinction, and the geological imprint of nuclear testing are just some of the irreversible signs that demonstrate the existence of this force.

The category of the Anthropocene has circulated and fluctuated between the natural and social sciences, the humanities, and the worlds of artistic production, influencing cultural and political debates far beyond the boundaries of academia. The term that scholars like Paul J. Crutzen and Oswald Wilson use to describe life in human form and in relation to other living beings is "species." However, many people dislike the "Anthropos" of the Anthropocene. Moreover, as demonstrated by the numerous studies on subjectivity developed over the past forty years, there are serious risks in placing humans on a universalist analytical line. Some scientists offer a different history. Proponents of the category of "Capitalocene" argue that it is the history of capital (including its class, color, and gender boundaries), not the history of humanity, that explains the modern features of global ecology. Not all of us are affected in the same way. The species is not a good category for thinking about politics. It is better to return the analysis of global ecology to society, or rather to the power relations within society.

#### Anthropocene and the history of fermentation

The narrative of humanity and the narrative of capital reveal critical insights. Alongside these, another story emerges—one that moves beyond human exceptionalism and explores socio-material relations through the lens of fermentation. Bacterial fermentation, an ancient process in Earth's history, began when atmospheric oxygen reached sufficient levels to support aerobic life. Over billions of years, as bacteria were the planet's sole inhabitants, they profoundly transformed Earth's surface. This transformative process enabled the first symbiotic interactions among unicellular organisms, paving the way for the evolution of fungi, plants, and animals through a phenomenon known as symbiogenesis. Fermentation thus played a crucial role in the co-evolution of all species. It fostered relationships between bacteria and other life forms, giving rise to new biological systems. Everyday actions, like kneading bread or enjoying wine, are reminders of the co-evolutionary bonds between bacteria and multicellular organisms. Humanity itself is a composite of many species, reliant on bacteria for survival and functionality. Life is inherently dependent on interspecies relationships and processes of mutual dependence.

Understanding life and evolution through fermentation challenges notions of human exceptionalism and redefines the boundaries of what is considered natural or cultural. Fermentation underscores that ecological relationships are essential, yet in the context of contemporary technoscientific transformation, these connections cannot be separated into distinct categories of nature and culture or society and matter. Modern life is characterized by a hybrid configuration, where the experiences of urban and rural spaces alike are deeply entangled with social, material, and technological elements. The distinctions between existing entities—whether artifacts, animals, plants, or humans—are dissolving, necessitating a broader understanding of their interconnectedness.

In this era, political ecology takes on a new significance, focused on the politics of materiality. It no longer revolves around abstract resistance but emphasizes tangible transformations in entities and ecosystems. This evolving field prioritizes coexistence among diverse beings and seeks to build material alternatives that enrich life for all inhabitants of the planet. Experimentation becomes a core practice, fostering innovative relationships among people, plants, artifacts, and technologies. Movements ranging from environmental activism to maker culture and biohacking exemplify this shift, blurring traditional divides between nature and culture.

The capacity to achieve material transformations—termed constitutive politics—does not align with conventional notions of human agency. Instead, it reflects a situated ability to act within specific problems and contexts. This reimagining of political ecology centers on concrete practices

and interactions, creating a relational ecology that is both sustainable and inclusive. Such a framework calls for alternative approaches to coexistence, where humans, non-humans, and inorganic materials collaborate to shape forms of life that are equitable and resilient.

A political ecology grounded in materiality requires a rejection of grand narratives that envision humans as controllers of nature and technology. Instead, it advocates for relational practices that highlight interconnectedness and mutual influence. This approach acknowledges the importance of transformative action—activities that reshape socio-ecological contexts and foster coexistence between diverse actors. In the Anthropocene, survival depends on the ability to influence material transformations and invent alternative modes of coexistence that integrate species, materials, and technologies. Ultimately, if all that exists is material, then every transformative activity is inherently a form of political engagement with materiality. By embracing this perspective, it becomes possible to imagine and create new ontologies, worlds, and forms of life that respond to the challenges and opportunities of the contemporary age.

# 2.2 Indigenous Populations

Also known as natives or aboriginals, "indigenous peoples" are considered the first inhabitants of a region, distinguishing them from other groups that have occupied or colonized the same area more recently. In 2016, 370 million people (5% of the global population) identified themselves as belonging to an indigenous population. The largest groups live in South America (such as the Quechua in Bolivia), Africa (ranging from the Tuareg in Algeria to the Maasai in Tanzania), Russia (with at least 50 million people), not to mention the Australian Aborigines and the numerous indigenous groups living in the archipelagos of Oceania, such as the Samoans or the Maori.

Essentially, indigenous populations are found wherever colonizing peoples, often European, have been. Because they are considered "different" from Western culture, these populations are subject to social and political discrimination by the governments of the states in which they reside. The first instrument recognizing the right of indigenous peoples to defend their culture is the right to own their ancestral lands. The United Nations Declaration on the Rights of Indigenous Peoples, which acknowledges this right, was only published in 2007.

In general terms, climate change tends to have a more severe impact on already fragile situations, making them more "sensitive" to further deterioration. The way of life of indigenous groups represents one of these fragile situations, primarily for two reasons: first, indigenous populations belong to the poorest segments of society, which results in limited educational, healthcare, and economic opportunities. Furthermore, social discrimination and indifference toward

their rights and needs by local governments often create a barrier preventing them from being represented in political bodies and from participating in the development of their countries. In addition, climate change exacerbates their economic precariousness, as the consequences of extreme weather events—such as crop loss due to drought or particularly violent flooding—further deepen their vulnerability.

Let us take the Arctic, Greenland, and the northeastern coasts of Canada as an example: this is the home of the Inuit. The Inuit survive in the Arctic climate by basing their economy on reindeer herding, hunting whales, seals, and bears, but most importantly, fishing. These activities are crucial both for maintaining their traditions and for defining their role within the community. For instance, there are different types of hunters, each specializing in a different type of animal. Whether hunting seals or whales, all hunters learn the importance of providing for the community through their service by procuring food. For this reason, elders have the responsibility of passing down the trades that define their identity to the younger generation.

Unfortunately, the melting ice at the North Pole and the weather instability, caused by a rise in temperatures that is well above the global average at the poles, have drastically altered their daily life. First and foremost, it has impacted their mobility: some Inuit populations are accustomed to traveling many kilometers each day to hunt, fish, or follow the migration of reindeer, using snowmobiles or dog sleds, with which they cross frozen lakes and rivers. The rise in temperatures has led to a thinning of the surface ice, and as a result, travel is becoming increasingly unsafe, raising the risk of drowning. Moreover, hunting areas will undergo constant changes, as animals will be forced to alter their migratory paths to avoid "new" natural obstacles. In short, for the Inuit people, the melting of the ice poses a real threat to their identity and food security. This is just one example of how climate change can affect the way of life of indigenous populations, endangering not only the continuity of the economic activities upon which community subsistence depends but also their culture and, consequently, their identity.

The link between climate change and the lifestyles of indigenous communities is not only significant due to the negative impact of the former on the latter but also because of the fundamental role these communities can play in safeguarding our planet. The organization Cultural Survival, which advocates for the rights of indigenous peoples, explains that this 5% of the global population is the protector of about 80% of the world's biodiversity. The reason is simple: these indigenous groups are deeply, and often spiritually, connected to the environment in which they live, to nature, and its resources.

A fundamental truth underlying the ideology of the climate justice movement is that many of the countries relatively less responsible for contributing to the current climate crisis are those most vulnerable to its impact. As noted in Luisetti's book, the environmental crisis is linked to a broader crisis of human subjectivity, influenced by ecological fragility and the destruction of ecosystems, phenomena that undermine the centrality of human beings.

The Western conception of the "person" perpetuates dynamics of domination over what is considered "non-human". It thus proposes a de-colonial ecology that goes beyond anthropocentric notions of subjectivity. Due to European colonizers and financiers people, plants, and animals native to ancient and prosperous lands were uprooted from their socio-ecological contexts, transported across the globe, and assembled as forced labor in the inhumane labor camps of New World plantations. The consequence of these actions led to unprecedented flows of resources and labor, set in motion by this circulation of natures, which has traced an immense fracture on the planet between colonies and metropolitan centers, disrupting both humanity and territories.

Today, environmental conflicts over waste management, land and water appropriation, biodiversity conservation, minerals, fossil fuels, renewable resources, and biomass are spreading across the globe, reproducing this original colonial fracture.

Neoliberal ecologies are globalizing these wounded environments through cybernetic modeling of life-support systems, marketization, deregulation, and speculative trade objects (abstract emissions units, ecosystem services, carbon markets).

Unless indigenous peoples are dispossessed or persuaded through corrupt practices to make way for new plantations, mines, and energy infrastructure, they are subject to the guidance of transnational non-governmental organizations (NGOs). Indigenous peoples are the guardians of biodiversity. This "planetary regime", ecologically destructive, is being challenged by multispecies approaches that express growing resistance to the capitalist globalization of nature and the imagining of alternative and livable worlds. Multispecies thinking incorporates mutualistic and symbiotic biology, relational and pluralistic ontologies, posthumanism, intersectional approaches, ecosemiotics, and multinaturalist epistemologies. It is necessary to fight neoliberal hegemony by appealing to a cooperative interpretation of evolutionary principles. However, multispecies thinking often focuses on life, which is a biocentric concept that fails to fully recognize the ways in which abiotic layers exist, that is, the ways in which non-human geographical areas exist, in which the era and mode of existence are inconsistent with the coordinates of living beings.

#### **Colonial Policies and Exploitation of Indigenous Peoples**

Analyzing data from the World Bank (See Fig. 1) on countries with the lowest per capita carbon dioxide emissions, it has emerged that countries such as Somalia, Chad, Malawi, and Niger are

among the most affected by climate change, yet they contribute the least to greenhouse gas emissions. Naturally, many of the countries that suffer the most from these effects are also among the highest emitters, but they are also among those that can respond to disasters when they occur.

Fig. 1:



\*Source: World Bank

One of the most recent reports published by the Intergovernmental Panel on Climate Change (IPCC) shows that the current development challenges, which increase vulnerability, are influenced by historical and persistent patterns of inequality, such as colonialism, particularly for many indigenous populations and local communities. This is one of the evident consequences dating back to the colonial era. Indeed, during the postcolonial period, most of the lands occupied by the socalled world powers (the United Kingdom, Spain, Portugal, France, etc.), the occupying states, were left stripped of their natural resources. These resources, extracted by colonists for their own enrichment, were essential not only for the maintenance of the lands themselves but also for the subsistence of indigenous populations. Without the necessary raw materials to sustain themselves, these populations were forced to migrate to other lands, and/or worse, to begin alternative crops that were unsuitable for the places they found themselves in. All these consequences gradually became an integral part of the climate problem, altering ecosystems and, most notably, causing a disparity in resources and wealth between the Global North and the Global South. This marks a significant step in raising awareness of an often-overlooked aspect of climate change. The history of conquest and foreign expansion, which involved many European nations from the 1800s onwards with the socalled "Scramble for Africa," led to the creation of colonies to extract natural resources, fueling the growing industrial demand. This unchecked exploitation continued into the 20th century, leaving many nations exposed to extreme weather events and with limited economic resources. Furthermore, it forced African populations and tribes living in those lands to adopt a completely different and inadequate lifestyle, without any choice, while their lands, homes, and traditions were entirely destroyed.

Indigenous populations, recognized by the Food and Agriculture Organization as the guardians of biodiversity, are particularly affected. An example is the indigenous communities of

the Kalahari Desert (spanning Botswana, Namibia, and South Africa), who have been forced to adapt to a life dependent on water wells dug by the government and government subsidies, as their traditional means of livelihood have been compromised by environmental degradation.

Historical and present-day injustices have both left Black, Indigenous, and people-of-colour communities exposed to far greater environmental health hazards than white communities. Those most affected by climate change are Black and poor communities. As a continent we are one of the hardest hit by the impacts of climate change and we are left behind as the world progresses toward a low-carbon economy. Without taking into account those most affected, climate solutions will turn into climate exclusion. (Veronica Mulenga, BBC, 2022)

## The Benefits of Indigenous Environmental Management

Indigenous contributions are essential for the design and implementation of ecosystem-based solutions. Traditional knowledge and heritage can contribute significantly to environmental assessment and the sustainable management of ecosystems. For instance, a report by the Food and Agriculture Organization of the United Nations and the Fund for the Development of Indigenous Populations in Latin America and the Caribbean (FILAC) found that indigenous populations in Latin America are the best guardians of the region's forests. The deforestation rates in their areas are up to 50% lower than in other regions. Indigenous and tribal areas store approximately one-third of the carbon in Latin American forests and are rich in culture, knowledge, and natural resources, though they have limited access to income or services.

As previously mentioned, indigenous populations make up less than 5% of the global population but protect 80% of the remaining biodiversity. They are vital for safeguarding some of the Earth's wildest areas, managing 40% of these spaces. Collectively, they are entitled to more than a quarter of the world's land area, which amounts to over 38 million square kilometers across 87 countries.

Furthermore, supporting the conservation efforts of indigenous communities can help prevent new pandemics, most of which are caused by natural destruction. We already know that deforestation rates are halved in areas inhabited by indigenous populations, but there is more. Approximately 65% of these areas are protected from exploitation, compared to only 44% in other regions. Numerous examples illustrate how indigenous territorial governance has proven effective, durable, and resilient, and how such governance models can lead to sustainable relationships between people and the landscape, considering indigenous peoples' perspectives. We demonstrate how this can be achieved, and we promote it frequently. After all, they are the people who know

their lands best, and according to the World Bank, they can always rely on their "long-standing knowledge of adaptation and mitigation of risks posed by climate change and natural disasters".

We attribute the creation of over 700,000 square kilometers of protected areas on Easter Island to the Rapa Nui people. It is thanks to indigenous peoples that the massive Uluru in Australia is protected from uncontrolled tourism, and it is thanks to the Māori that the Whanganui River in New Zealand enjoys the same legal rights as humans. Indigenous peoples are willing to risk their lives to protect their territory. Native Americans, stripped of all rights, do not feel homeless because the land is their home. Who could protect the planet better than they?

#### What to Expect from the Meeting Between Indigenous Peoples and Climatologists

The custodians of Aboriginal knowledge and the scientific community have developed guidelines for initiating collaborations that are both ethically and culturally appropriate. The official final story, currently under development, will serve as the starting point for the rest of the world. In Shark Bay, the hometown of Bianca McNeil, local residents followed the advice of scientists and began planting aquatic plants to absorb carbon dioxide. "It's like planting a tree in the sea, it's something magical." Maintaining a spiritual connection with nature never abandons hope. Sometimes, to find the strength to fight, all we need is a friend, their advice, and a simple action that makes an impact.

#### 2.3 Green Colonialism

Globally, Indigenous peoples control or hold at least 38 million square kilometers of land across 87 countries or politically distinct territories on every continent they inhabit. This represents more than a quarter of the world's land surface and covers approximately 40% of all protected terrestrial areas and ecologically intact landscapes. However, they are rarely involved in conservation projects, and their rights are often restricted in favor of industries that clear land and destroy the environment. Indigenous communities are regularly deprived of civil rights, even by environmental organizations that should be responsible for environmental protection. This phenomenon is known as "green colonialism," and it is much more widespread than one might think.

Green colonialism can take various forms depending on the context. Typically, it occurs when the Global North achieves high living standards by exploiting the health, labor, and land of the Global South. Green colonialism can also occur within countries. Interestingly, significant investments in renewable energy and other conservation efforts often come at the expense of

marginalized communities, such as Indigenous peoples. The intentions are well-meaning. For example, an environmental organization may aim to designate forests as protected areas so that multinational corporations cannot freely exploit them. However, Indigenous communities that have long relied on the forests for medical, cultural, and hunting purposes are not longer able to carry out these activities in the forests and are often forcibly displaced.

One example is the situation of Indigenous communities in Brazil: According to an essay by Canadian journalist Naomi Klein, Indigenous Brazilian populations have often found that some of the most aggressive land grabs are carried out by conservation organizations. A forest is renamed as a carbon offset area and declared off-limits to its traditional inhabitants. Farmers and Indigenous people are frequently physically attacked by park rangers or private security when they attempt to access these lands.

Another example occurs when renewable energy companies need to clear land to build wind turbines. If a community lives on the land where a company wants to build, it can obtain permission from the government and, in many cases, force the community to be evicted. This does not mean that these projects should not be pursued, but rather that the rights of the groups who may be affected need to be taken into account. Ideally, Indigenous communities should be included in these projects, as they possess extensive knowledge and experience in ecosystem conservation.

The issue faced by Indigenous populations is not confined to remote regions of the Global South. Let us now consider the case of Norway: in April 2020, a new wind energy project was announced in Saepmie, the ancestral land of the Sami Indigenous people, who have been herding reindeer for centuries. Approximately 98% of Norway's electricity production comes from renewable energy sources, but the impact of these projects on the Sami way of life is often overlooked. The Oyfjellet wind farm is not the first encroachment the municipality has faced. Several hydroelectric dams in the area have reduced grazing lands, exposing the herds to greater danger when crossing the unstable ice of the dam. Projects like Oyfjellet disrupt reindeer migration, especially during the winter months, when pregnant females and newborn calves are particularly vulnerable. In theory, Norwegian reindeer herding laws should offer legal protection against the disruption of migration routes, as in this case, but authorities allowed construction activities to proceed. In fact, the Norwegian government has granted over 100 additional permits for wind energy development, some of which are located on Sami territory.

In June, herders announced that they would sue to stop the wind farm. Early in that month, the Frostating Court of Appeal ruled that one-third of the city's winter pastures had been destroyed by construction activities and ordered compensation of 89 million Norwegian kroner (approximately \$9.4 million). This ruling illustrates the immense difficulty in halting wind energy

projects to ensure the cultural survival of the Sami. However, by granting compensation to the local residents for their losses instead of closing the wind farm, the court assigned an economic value to the Sami way of life. This has reinforced the tendency of the Norwegian government and industry to "sell" Indigenous rights in the name of development and resource extraction.

Another example of green colonialism can he found in Israel: when Israel was declared a Jewish state in May 1948, native trees (such as oak, carob, and hawthorn) and crops (including olives, figs, and almonds) were uprooted and replaced with European pines. These pines have reduced biodiversity and destroyed the local environment. The pines produce acidic leaves that inhibit the growth of understory plants. These trees are also highly resinous, making them particularly susceptible to fire. As a result, fires have become common in areas where these pines were planted. Moreover, the "apartheid wall" in the West Bank obstructs animal movement and contributes to the loss of biodiversity. Additionally, Israel sends waste, including electronic waste, to Palestine. These waste materials are often recycled by impoverished Palestinians in environmentally harmful ways, such as using fire to remove metals from plastics, releasing substances that cause diseases like cancer. Israel has also constructed an extensive network of roads and other infrastructure, much of it on land previously used by Palestinians for agriculture, grazing, and recreational activities.

Unfortunately, Israel has taken land from Palestinians in the name of preventing environmental destruction. For example, under this pretext, the Palestinian village of Ras Imwais and six adjacent areas were first confiscated and then converted into the Nahal Shiloh settlement. In some cases, Israeli authorities claimed the land as "green space" and transformed it into Jewish settlements two or three years later.

#### How Can We Reverse Green Colonialism?

In his book "Nonhuman Subjets", Luisetti criticizes how neoliberalism, through measures such as carbon markets and ecosystem services, has reduced nature to exploitable economic capital. In response, he examines the role of social movements and decolonial thinkers who resist the commercialization of nature and advocate for the inclusion of more-than-human actors in environmental political decisions.

Certainly, we should strive to further expand renewable energy capacity and implement conservation programs, but politicians and project managers have been caring for ecosystems worldwide for centuries. We should do this in collaboration with Indigenous communities.

In addition to the active participation of Indigenous communities, there is also an urgent need for "climate justice" and a "just transition." Recognizing that climate change has a range of social, economic, public health, and other impacts on disadvantaged and minority groups, such as people of color and Indigenous communities, is crucial. These inequalities must be addressed through long-term mitigation and adaptation strategies.

Furthermore, paying Indigenous and tribal communities for environmental services on their lands has reduced deforestation in countries like Ecuador, Mexico, and Peru. Such programs are being implemented elsewhere and have the potential to generate hundreds of millions of dollars annually from international sources.

While it is positive that the world is moving toward a greener future, we must do so responsibly, ensuring that the rights of Indigenous communities and other marginalized groups are respected and that they are included in conservation efforts. Failing to do so is disrespectful, endangers these people, and prevents them from enjoying the sustainable future that so many have worked so hard to achieve.

#### **Multispecies Ecologies vs Third Ecology**

While multispecies thinking celebrates cooperation and interdependence among living beings, this concept can also be extended to inanimate elements. In this framework, the "third ecology" recognizes that entities such as stones and rivers can assume a political role despite not being biologically alive, valuing their contribution to global ecological struggles. This approach proposes overcoming the biocentric perspective and adopting an inclusive vision that embraces the agency of geobodies, allowing them to become part of ecopolitical communities without being subordinated to the logic of the "living." This perspective offers a foundation for a more equitable and inclusive ecology, capable of rethinking the relationship between living and non-living entities.

In the Andes, the intersection between threatened ecosystems and state action has led to innovative jurisprudence, where natural elements like rivers, glaciers, and valleys acquire legal personhood. This phenomenon, referred to as "wild law," attempts to attribute political subjectivity to natural entities, partly in support of Indigenous claims. However, this approach, based on the Western logocentric tradition, presents intrinsic limitations due to its definition of legal personhood.

Christopher D. Stone has emphasized the need to treat natural beings as "legal incompetents," represented by human guardians, a model already applied to other voiceless subjects, such as infants or corporations. Bruno Latour, on the other hand, developed a philosophy that recognizes the central role of human mediators in giving voice to natural entities, highlighting

the link between legal subjectivity and exclusion. This approach, however, remains tied to the Aristotelian logocentric tradition, which privileges speech as the foundation of political participation.

Legal studies show how the Western conception of legal personhood is rooted in Roman law and its metaphysical unification of body and spirit. However, in the Indigenous cultures of the Andes, an alternative view emerges: the Waka, spiritual entities linked to natural elements, are considered animate subjects, capable of protecting, punishing, and interacting with humans through rituals and narratives. These living beings disrupt the sharp ontological divide between nature and humanity that characterizes Western modernity.

The Andean approach, described by Marisol de la Cadena, overcomes the Western biocentric language by attributing agency to earthly beings through ritual and affective encounters. These non-human beings, such as sacred mountains, participate in politics both symbolically and concretely, challenging the dominant anthropocentric vision. Their subjectivity is co-constructed in alliance with Indigenous communities, who reinterpret modern politics as a dialogue between worlds.

The jurisprudence of nature and Indigenous practices in the Andes offer alternative models of relationship between humans and non-humans, revealing the limitations of the Western logocentric tradition and opening new possibilities for an inclusive politics of natural entities.

# 2.4 Intersectionality

As we have seen, the climate crisis has a differentiated impact based on factors such as gender, ethnicity, social class, and geography, creating a complex web of disadvantages for some groups more than others. To understand this concept more deeply, we must talk about "Intersectionality."

Intersectionality, derived from "intersection," refers to a place where things come together. It recognizes that we all have multiple identities that intersect to shape who we are. It also provides a way to discuss the oppressions and privileges that overlap and reinforce each other. This term dates back to the 1980s and legal scholar Kimberlé Crenshaw. She observed that there was no effective way to discuss how the experiences of Black women differ from those of Black men and white women: Black women endure both gender discrimination and racial discrimination.

Over the last 30 years, scholars, educators, and activists have expanded the use of the term "Intersectionality" to discuss identities beyond race and gender. Members of marginalized groups cannot choose whether to think about their identity. On the other hand, members of privileged groups can ignore intersectionality if they wish. Life is not the same for everyone, even for those

who share similar identity characteristics. By adopting an intersectional perspective, we are more likely to understand why things are the way they are and to change the systems that help or harm us, depending on who we are.

To clarify the climate crisis by simultaneously analyzing broader dimensions of oppression, the question is posed: "Why is climate change inherently racist?" We cannot ignore the fact that those who are often on the front lines of climate-related disasters are people of color and marginalized groups. Unfortunately, the reality is that the climate crisis has been impacting people of color for years. There are many complex reasons for this. In short, the lives of Indigenous populations in African, Asian, and other parts of the world have been deliberately ignored and devalued by large corporations and Western nations. This has happened because, for centuries, money and power have been valued over certain human lives, and this is not a thing of the past. The climate crisis continues to affect various populations around the world with varying degrees of severity. Today, already vulnerable populations globally, such as women and people of color, are much more likely to be impacted by the devastating effects of climate change. When we talk about disasters, we mean floods, heatwaves, droughts, wildfires, and rising sea levels. All these events ultimately make it difficult for those affected to secure food, shelter, and other basic human needs.

#### What is the reason for this imbalance?

The extreme effects of climate change are particularly felt in developing countries such as Indonesia, Colombia, and Kenya, often referred to as the Global South. The United Nations recently announced that, on average, a climate disaster—such as a heatwave, storm, or flood—occurs every week around the world, with the majority of these disasters taking place in the Global South. Although climate change is rarely cited in the news as the cause of these disasters, it is true that extreme weather events are becoming increasingly frequent and Intense as a result of climate change.

For example, if we look at Bangladesh, one of the most affected countries, its low-lying coastline is particularly vulnerable to flooding and cyclones, and climate change is making these events more frequent and severe. In 2020, the country's coast was struck by Cyclone Amphan, the most powerful cyclone Bangladesh has experienced in the last 20 years. It is estimated that one in seven people will be displaced due to climate change by 2050, but more importantly, it is much less likely that those most affected have contributed to the problem.

Researchers from Oxfam found that in just five days, the British emit as much carbon dioxide as the people of Rwanda do in an entire year. By January 12 each year, the United

Kingdom's average emissions will surpass the per capita annual emissions of six other African countries (Malawi, Ethiopia, Uganda, Madagascar, Guinea, and Burkina Faso). However, this is not about blaming individuals who sometimes forget to turn off the kitchen light or only go on vacation with their families once a year. Only a handful of companies are responsible for the greatest damage to the planet. The 2017 Carbon Measures Report identified 100 companies that have contributed to 71% of global greenhouse gas emissions since 1988. Major companies include BP, Shell, and ExxonMobil. Those who benefit personally from the climate crisis are the parts of the world that are primarily responsible for the problem, including countries like the United States and the United Kingdom, while the Global South must confront this issue. The climate crisis is also affecting communities in wealthy countries, with Black Africans and Caribbeans in the United Kingdom exposed to higher levels of illegal air pollution than any other ethnic group in the country. This is not a coincidence. People of color in Europe and North America are more likely to live in substandard housing in urban areas and work in industry, but structural racism leaves them more exposed to pollution. If we are to seriously address both racism and climate change, we must also address the immense inequalities and injustices faced by people of color in the United Kingdom and other countries.

Although people of color in developing countries are on the front lines of climate impacts, they have also been among the first to resist environmental degradation. Indigenous knowledge has been key to protecting our planet for thousands of years. People of color have lived in harmony with nature by practicing sustainable agriculture, effective fire protection techniques, and waste management practices. These technologies are often more environmentally friendly than industrial solutions. They are also at the forefront of the global fight to protect nature. People of color in the Global South have cared for the Earth for thousands of years, but now they have fewer resources, including infrastructure, to cope with the effects of climate change. The primary cause of this inequality is racism that dates back hundreds of years. Many of these countries (as mentioned above) share a long history of colonial domination, during which their lands and labor resources were stolen by European colonizers. Their prosperous societies and economies were reshaped for the benefit of European empires. This means that the legacy of colonialism is still alive today. From trade systems established to benefit the West to foreign companies and multinational corporations that continue to plunder land and local resources in the Global South through extractive industries like mining and fast fashion, these structural inequalities make it so that countries in the Global South are less able to cope with climate disasters when they occur.

Race is a big factor in how people experience climate change, but the structural inequalities do not end there: gender, sexuality, age, disability and more can also play a part. The unfortunate

truth is that the climate crisis is affecting people who are already marginalized far more. That means it is impossible for us to talk about the climate breakdown without talking about inequality, because one is crucial to our understanding of the other.

Therefore, Climate crisis is a race issue, and to deal with climate chaos we cannot leave racism out of the picture. When we talk about racism, we often mean personal prejudice or institutional biases. Climate change doesn't work that way. It is structurally racist, disproportionately caused by majority white people in majority white countries, with the damage unleashed overwhelmingly on people of color. The climate crisis reflects and reinforces racial injustices. This is linked to the colonial legacy of the climate crisis.

For some, it can be disconcerting to hear terms such as "racism" and "white supremacy" used in discussions about climate change. Climate change is often understood as an environmental issue, one that we are all in together, and therefore not something that could be in any way construed as racist. Civil rights activists Charles Hamilton and Kwame Ture first coined the term "institutional racism" in their 1960s book *Black Power*. They used housing as an example. If a Black family moves into a white neighborhood and is mistreated, the community may recognize the situation as racist. People will likely feel ashamed, and some may openly criticize the circumstances. However, if a Black family cannot move in because they are unable to obtain a mortgage, or if a real estate agent refuses to show them properties in that part of the city, the racism remains invisible. This form of racism is not immediately apparent within the structure of the real estate power dynamics. Even when Black families are fully aware of being discriminated against, the white community can be reassured with the statement: "No, there is no racism here".

When racism is structured in this way, it operates without any apparent intent. Intentional acts of discrimination cannot be identified, and the "racists" cannot be pinpointed or condemned. This is certainly the case with climate change. There is no secret committee of white individuals deliberately attempting to bring climate change to the Global South. However, darker-skinned people remain disadvantaged and experience statistically significant disparities in outcomes.

Zambia is a clear example of the injustice of climate change. The average carbon footprint of Zambia is very low, only 0.36 tons per capita per year, less than a tenth of the United Kingdom's average. Yet, the country faces environmental disasters, including a prolonged drought, with over 1 million people needing food aid in 2021. These changes in precipitation and temperature are leading to poor harvests, livestock deaths, and a decline in Gross Domestic Product (GDP).

Zambia has suffered the negative impact of climate variability and change over the past three decades. The greatest impact has been the increase in temperature and the reduction in rainfall, leading to climate shocks, including droughts and floods. Droughts, in

particular, have resulted in the loss of livelihoods for the agricultural sector, which is dominated by smallholder farmers, as production depends on the availability of adequate rainfall. (Mulako Kabisa, BBC, 2022).

These experiences of climate breakdown generally do not make the news. This exclusion extends to international negotiations:

African voices are poorly represented in climate summits, leaving climate justice out of the equation. At COP26, a lack of vaccines and available funding for African countries prevented many delegates and activists, including myself, from participating in the negotiations. Racism and white supremacy have long excluded African voices from environmental policy. (Mulenga Mpundu Kapwepwe, BBC, 2022).

The disparity between those who cause climate change and those who bear its burden in countries like Zambia represents a large-scale version of a recurring local environmental injustice.

Another example of intrinsic racism can be found in the United States: in many large cities, poorer residents live in hotter neighborhoods, which can present significant challenges and even pose risks to health and well-being.

#### 11°C vs 20°C

This is how much warmer one neighborhood can be compared to another within the same city. People living in these hotspots—predominantly low-income residents and people of color—face much greater challenges than those living in wealthier districts, including reduced productivity at work, less access to green spaces, more pollution, and even higher mortality rates.

This dangerous discrepancy is referred to as "intra-urban temperature variability," or simply the "heat gap." It occurs in cities across the globe, and exists because some neighborhoods end up receiving far fewer investments than wealthier areas. As a result, buildings in these areas tend to be of lower quality, with fewer air conditioning systems and more porous walls, which allow heat to accumulate. There are also fewer parks and green spaces that provide cooling and shade, and more paved areas that absorb heat.

"If a person lives in a really hot neighborhood, it's very likely that the neighborhood is hot due to a series of disinvestments that have occurred systematically and chronically over decades". (Vivek Shandas, BBC, 2022)

Shandas states that many cities have histories of preventing immigrants and minorities from living in certain areas. The areas they were forced to live in received fewer tax dollars, which created the lower quality of life that can trigger the heat gap. The descendants of those affected often still live in these same neighborhoods, making the heat gap an inherited challenge and an example of generational inequality. In the United States, this partly unfolds due to a process called redlining, where the federal government denied mortgages to Black families from the 1930s to the 1960s because they were considered high-risk investments. This form of previously legal discrimination effectively excluded certain communities, mostly people of color, from purchasing homes in certain neighborhoods. Financial and real estate institutions then stopped serving the districts where those who were discriminated against ended up living. Redlining has been illegal for decades, but its effects continue to be seen today across urban America and remain a major contributor to the heat gap. This is the case in U.S. cities such as Baltimore, Portland, Oregon, and the national capital, Washington, D.C.

Similar examples abound around the world. Shandas was part of a team that studied the heat gap in Doha, Qatar: a place that has become so hot due to climate change that outdoor air conditioning has started to be implemented. The researchers found that if one is wealthier and not an immigrant, they are much more likely to live in a place with better air conditioning and more green spaces, including oases.

There are potential solutions to address the reasons behind the heat gap and how to close it. For now, the quickest solution is to provide people with more air. However, unless this is powered by renewable sources such as solar or wind, the use of air conditioning could still add more carbon emissions to the atmosphere, making it even hotter. This situation also creates "more of a drain on the power grid, causing more brownouts (power reductions) and blackouts" (Carlos Martín, Urban Institute, Washington, DC). Martín points to Melbourne, Australia, which has a massive tree planting plan that has seen both public and private investment. He also mentions Phoenix, Arizona, and Los Angeles for their tree planting grant programs and tree maintenance in low-income areas. But he emphasizes that a long-term solution is more than just planting trees; it boils down to financial investments.

These levels of systemic racism that have been in place for so long are being recognized, as well as the acknowledgment of how the systems we have created have pushed some communities to

be safe and secure. This is why, if we want cities to be comfortable and, most importantly, safe for all their residents, we must think bigger than simply a better construction project and adding green space.

#### 2.5 Resources Extraction

# Will the extraction of resources necessary for clean energy cause environmental problems?

Almost all mining activities, including those related to clean technologies, have negative impacts on ecosystems and local communities. Pollution, water scarcity, and the resulting social conflicts are fundamental concerns in the development of clean energy. From wind and solar energy to hybrid and electric vehicles, clean energy technologies are helping to slow climate change, but they are not inherently flawless. These technologies currently rely on critical minerals, the extraction of which is harmful to the environment. You may have heard of them: lithium, copper, graphite, zinc, cobalt, copper, and nickel are all on the list, along with rare earth elements derived from mineral compounds.

Moreover, these decarbonization technologies require more resources than fossil fuel-based technologies. For instance, electric cars require six times more minerals than gasoline cars, while onshore wind farms require nine times more minerals than gas-fired power plants (according to the International Energy Agency, hydroelectric, biomass, and nuclear energy have a "relatively low mineral requirement").

The extraction of these minerals also requires energy and fresh water and generates greenhouse gas emissions and waste. Mining activities can be dangerous for workers, and in some locations, they can lead to violations of human rights and labor rights. The surrounding communities, often in low-income and developing regions, bear a disproportionate share of these burdens, creating a complex network of conflicts over land use and environmental justice. Scott O'Dell, a postdoctoral researcher at the Environmental Solutions Initiative at the Massachusetts Institute of Technology, who studies mining, climate change, and socio-ecological conflicts, states that it is difficult to pinpoint the worst damages, but changes in land use and freshwater pollution and scarcity are the main concerns.

More than 80% of the mined areas in the world are used for the production of raw materials essential for renewable energy production. The processing of minerals, transporting slurries through pipelines, and dust suppression require water, which is often already scarce in areas where water is available. The Atacama Desert in Chile, the driest desert on Earth, is also one of the world's most

important copper mining areas. Mining companies not only deplete local water sources but can also contaminate clean sources.

During mineral extraction, a significant amount of waste is created. In the United States, copper extraction represents the largest share of metal extraction and processing waste. Some waste piles can cover up to 1,000 acres of land. Waste is generally stored in remote locations called tailing ponds, which in some cases (especially during natural disasters such as floods or earthquakes) fail to function properly, spilling toxins into nearby water systems. According to a 2019 Associated Press report, more than 50 million liters of contaminated wastewater from U.S. mines flow into local water sources every day. Mining activities damage natural resources in other ways, including air pollution from greenhouse gas emissions and toxic aerosols, deforestation worldwide, and sometimes putting biodiversity at risk, even in protected areas like Masu. For surrounding communities, the environmental damage caused by mining can lead to health problems such as cancer, respiratory diseases, poisoning of fish and crops, and long-term, sometimes violent, land use conflicts.

Reducing the environmental and social impact of the sector requires better regulation and more sustainable practices. This can be achieved, for example, by improving community consultation processes, ensuring the complete closure of mines and rehabilitation of abandoned mining sites, and finding ways to reduce or reuse mining waste.

Affected communities and environmental groups are fighting for greater accountability in the sector and for stricter, better-enforced regulations. O'Dell also suggested that more mining companies should collaborate with local communities to reduce tensions, such as by investing in desalination technology that would allow miners to draw water from the ocean rather than from local freshwater sources. Increasing awareness of these issues will also help steer the sector in a positive direction.

We need to respond to climate change and we're doing that by transitioning to clean energy, but we need to recognize that producing clean energy has its own environmental and social impacts that we need to fix concurrently. (Scott O'Dell, MIT Climate Portal, 2022)

Among the populations suffering from the consequences of resource extraction and climate change, there is one community in particular that stands out from all the others, which I came to learn about during my journey with CLIVEX. Among the numerous cases analyzed, this one, in particular, struck me deeply, almost more than any other: I refer to the "Roma" community.

The Roma community in the thriving Romanian city of Cluj-Napoca is treated as human waste by the authorities. Pollution caused by nearby landfills is putting their health at risk. There is a massive landfill near the airport, on the outskirts of Cluj-Napoca, one of the fastest-growing cities in Romania. Flying towards this area, it's easy to overlook the colorful rooftops scattered among the green grass and piles of trash. But even the ground level of this area is lively. A horse-drawn carriage intersects with an empty garbage truck returning to the city. Barefoot children run between the temporary wooden houses, and crows hover above their heads.

This is Pata Rat, the largest landfill in the country and, for many years, one of the biggest environmental crimes. Contamination from untreated waste and burning garbage has been rampant for decades, sometimes killing residents of these wooden shacks. This is literally a real community living in shacks within this massive landfill. They are ordinary people, as ordinary as anyone else—mothers with children, who go to school every day—yet they are forced to live in conditions that would be unimaginable for anyone.

Pata Rat represents a glaring case of environmental racism and socioeconomic marginalization. The landfill, one of the largest in the country, has for decades been a symbol of environmental and social degradation, where the Roma community has been forced to live in precarious and health-damaging conditions. This case illustrates the complex intersection of environmental policies, economic dynamics, and ethnic discrimination, which perpetuate the marginalization of vulnerable communities.

Under pressure from the European Union, the city began to close the site in 2015. Over 70 years, about 2.5 million tons (2.8 million tons in dollars) of waste were accumulated, covering an area as large as 27 football fields. By the end of 2019, local authorities declared Pata Rat a "historical site." But for the 1,500 Roma still living there, Pata Rat is still very much alive. And the same goes for the environmental risks at hand. Two "temporary storage" landfills built next to the previous one in 2015 are still expanding, and experts say that the old waste was never properly disposed of.

This was not an ecological landfill; it was not built in accordance with European standards. All these toxic substances entered the soil, the groundwater. Everything in the area is polluted. (Ciprian-Valentin Nodis, DW News, 2021)



'Temporary' landfills next to the original Pata Rat dump have been steadily growing for the last five years

mage: Bogdan Dincă/DW

The arrival of the Roma population in Pata Rat began between the late 1960s and early 1970s. While some moved to the landfills driven by poverty and acted as catalysts, most arrived following successive waves of evictions as Cluj-Napoca experienced a real estate boom in the 2000s. The last wave occurred in 2010, when local authorities evicted 350 residents from Coastay Street, near the city center.

Among the various testimonies heard over the years in the Pata Rat case is that of Linda Greta Zsiga. She recalls waking up her family on a cold December morning to find the police, municipal workers, and a bulldozer in front of their door. She and 75 other Roma families living on the street had been notified of their eviction just two days earlier. Their new home was supposed to be a complex of small modular units located between the existing Patarat fields.

Zsiga said that the Roma community on Kostei Street was well-integrated. They had lived there for generations, paying rent and utilities, and their children had attended local schools and kindergartens. However, they were suddenly thrown into the city's trash heap.

"They considered us trash, not human beings, and thought we deserved to live there." (Linda Greta Zsiga, DW News, 2021)

This represents the largest European ethnic minority exposed to the greatest environmental risks.

In response to a survey last year, seven out of ten Romanians said they did not trust the Roma. Between 20 and 30% stated that the Roma have too many rights, that the state should be allowed to use violence against them, or that discrimination and hatred towards the Roma should not be punished.

Such attitudes are not exclusive to Romania. Across Europe, as we have seen, racism against the continent's largest ethnic minority results in the denial of basic civil rights, exclusion from employment and public services, and—perhaps most surprisingly—the marginalization of Roma communities to areas lacking adequate water, healthcare, and waste management.

Often, these sites are also in dangerous locations. A study published last year by the European Environmental Bureau (EEB) on "Environmental Racism Against Roma Communities in Central and Eastern Europe" found that the Roma were "disproportionately exposed to environmental degradation and pollution from landfills and waste disposal, contaminated sites, or polluting industries."

#### **Testimonies from Pata Rat**

Upon arriving at Pata Rat, Zsiga found her extended family—12 people in total—crammed into a 172-square-foot room (16 square meters). The space was so cramped that they had to keep most of their belongings outside. They shared a single toilet and cold-water shower with the residents of three other similarly overcrowded rooms. Zsiga recalled looking out of her window through a sea of garbage: "There were no pigeons, no trees. I love nature."

A 2012 report by the United Nations Development Programme found that 22% of adults living in Pata Rat suffered from chronic illness or some form of disability. Researchers documented a high incidence of skin infections, asthma, bronchitis, high blood pressure, and heart and stomach problems. A report from the European Roma Rights Centre found that within two years of being evicted, health problems had more than doubled within the Coastei community.

The EEB study describes one of the main factors of environmental racism against the Roma as forced eviction from "high-value economic areas." The Coastei community was not given a reason for their eviction. But Zsiga has no doubts about why they were moved: "They wanted to clean Cluj of the Roma. Now very few Roma still live in the city." The municipality of Cluj-Napoca told DW that they are cleaning up Pata Rat and providing health and other services to the community. They also stated that they are trying to prevent evictions and are partners in a housing program for 30 families, although they are not providing funding for the program.

There is no solid health data from Pata Rat since the landfill has been covered, but an NGO worker in the area stated that respiratory illnesses remain common, even among children. Economically, the closure of the landfill has made life in Pata Rat even more difficult.

Adela Ludvig, a 28-year-old mother, has lived next to the landfill for as long as she can remember. Her home is made of plywood with a roof made from an old vinyl advertising banner—

scrap materials collected from the landfill. These days, her "villa," as Ludvig calls it, overlooks a chemical waste dump covered with blue plastic sheeting and protected by barbed wire.



Adela Ludvig and her children outside the home she built from scrap materials found on the landfill

mage: Bogdan Dincă/DW

Ludvig collected plastic bottles, sheets, cans, and cardboard. She said that a local recycling company paid the equivalent of  $\{0.12\ (\$0.14)\ \text{per kilogram}\ (2.2\ \text{pounds})\ \text{of plastic, meaning she}$  could make  $\{40\ \text{in one day}:\ "I\ could\ buy\ food\ or\ medicine\ when\ the\ children\ needed\ it."$  But the new "temporary" landfills are fenced off. When the waste burial was closed, waste collectors like Ludvig were left without work: "People were crying from hunger." Ludvig and her children—she is expecting a fifth—now live on the  $\{220\ \text{she}\ \text{receives}\ \text{in child}\ \text{benefits}\ \text{each\ month}$ . The nearest water source is several hundred meters away, and she has to visit it four or five times a day to meet her family's needs. They have access to a generator, but they cannot afford to pay for the fuel.

#### **Pata Rat Communities React**

A year after the landfill was declared "history", the mayor of Cluj-Napoca promised that the fields of Pata Rat would "disappear by 2030," without indicating what would happen to the 350 families living there. But long before his announcement, the residents had taken matters into their own hands.

In 2012, Zsiga and others from the Coastei camp formed an association that is working with other NGOs to campaign for housing solutions for Pata Rat and to sue the authorities over the evictions. They are currently awaiting a decision from the European Court of Human Rights regarding their case. And thanks to an initiative supported by Norway Grants, through which the Norwegian government funds social projects in Southern and Eastern Europe, 35 families from Coastei were relocated to Cluj-Napoca or nearby villages between 2014 and 2017.

Zsiga, her partner, and their children now live in a three-room apartment in the city. But she has not turned her back on Pata Rat. Her brothers and their families still live there, and she is working on-site to support another 30 families who will move in a second phase of the initiative. "I wish no one had to stay in Pata Rat. No one deserves to live there."

#### Impact on the MENA Region

The Middle East and North Africa (MENA) region is facing an acceleration of the impacts of climate change, with temperature increases significantly exceeding the global average. In a region already characterized by summers with temperatures ranging between 40 and 50°C, peaks of 53-54°C are now being recorded in countries such as Saudi Arabia, the United Arab Emirates, Oman, and Iraq. This phenomenon is not an isolated anomaly but rather a growing trend attributable to global warming, which has already pushed the global average temperature approximately 1.1°C above pre-industrial levels. However, some areas in the MENA region exhibit temperature increases that are double the global average, further exacerbating environmental and socio-economic vulnerability.

The rise in temperatures in the region is amplified by processes known as positive feedback loops, in which the effects of climate change are intensified by local conditions. These mechanisms accelerate regional climate changes, making some areas increasingly uninhabitable. For example, in southern Iraq, the collapse of aquaculture and the exodus of farmers to cities have overwhelmed urban infrastructure, worsening the water crisis and social tensions.

The climate challenges in MENA undermine economic sustainability and quality of life. The availability of essential resources, such as water, is compromised, making it difficult for populations to adapt to extreme conditions without external support. Regional economies face the need for structural transformation, shifting away from vulnerable sectors such as rainfed agriculture to more resilient models, for instance, through the adoption of innovative technologies like drip irrigation and the reduction of water-intensive crops. However, such transformations require significant investments and effective governance, which are often lacking in the region.

Environmental issues in MENA are often exacerbated by governance failures. The case of Lebanon is emblematic: although the country has good natural water availability, inadequate infrastructure, fuel and electricity shortages, and political fragmentation hinder effective water resource management. These failures result in economic collapses, forced migrations, and conflicts, fueling a cycle of environmental vulnerability and social instability.

Addressing climate challenges in the region requires an integrated approach that includes technological innovation, economic support, and institutional reforms. In particular, there is a need to invest in resilient infrastructure, improve resource management, and promote regional cooperation. Additionally, the recovery of traditional practices, such as Palestinian agricultural methods, can offer sustainable adaptation models.

The MENA region stands at a crossroads: climate change, amplified by local and global dynamics, threatens both livability and economic and social stability. Overcoming these challenges requires a large-scale transformation, supported by both international and local resources, to ensure that populations can live under dignified and sustainable conditions. In this context, climate justice entails not only the redistribution of burdens but also a recognition of shared responsibilities in ensuring a resilient future for the most vulnerable communities.

# 2.6 Climate Change and Conflict Connection

There are several theories linking climate change to armed conflict. But how do they measure up against the evidence? There is evidence that climate change can prolong or exacerbate existing conflicts, but these theories are in competition with one another.

There is certainly a close relationship between climate change and the depletion of many natural resources, particularly water and arable land. However, this theory assumes that the relationship between resource scarcity and conflict is relatively simple. A lack of resources does not necessarily lead to armed conflict. There are many examples of scarcity being addressed peacefully.

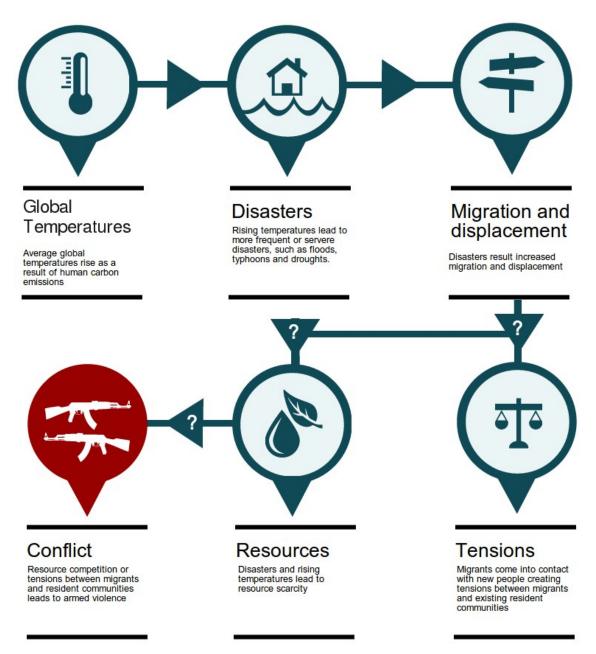
It is demonstrated that disasters can lead to migration and displacement. Depending on the disaster, millions of people may be temporarily or permanently displaced. However, there is little evidence that immigration creates tensions in new locations or that newcomers compete with established communities for resources. When such tensions exist, there is little evidence to suggest they lead to armed violence.

There is evidence of a connection between climate change, disasters, and displacement. It is also true that many people are forced to take refuge after a catastrophe.

Generally, it is not true that rebel groups recruit in refugee camps. There are some notable exceptions, but this is not the case in most camps.

There is little evidence that the presence of people displaced by natural disasters is a significant factor in the transmission of conflict when it spreads from one region to another.

While there is evidence that climate change may exacerbate conflict, it is still unclear how one causes the other. It may be impossible to explain a causal mechanism that applies universally. Instead, different mechanisms operate in different situations and in different places.



Alex Randall coordinates the UK Climate Change and Migration Coalition.

At the beginning of 2022, journalists began to question the impact of Russia's large-scale invasion of Ukraine on the climate crisis. For two decades, international analyses and debates on the relationship between climate change and security have focused on how rapid climate destabilization may undermine national security. However, they have largely overlooked how decisions related to national security, such as military spending and the conduct of war, can affect the climate and, in turn, undermine collective security. As climate destruction continues and accelerates, it is crucial to understand and minimize emissions arising from all social activities, whether in times of peace or war. However, when it comes to military emissions and conflicts, this remains a distant goal.

Russia's war in Ukraine marked the first attempt to fully document the emissions from the conflict, requiring researchers to develop a method from scratch. According to the latest estimates, the total amount of emissions is equivalent to the annual emissions of a country like Belgium. Ukraine is not the only country requesting similar data on emissions for Israel's war against Hamas. The ongoing catastrophic conflicts in Sudan and Myanmar have yet to attract attention regarding their emissions, but the trends are clear. Understanding the carbon costs of conflicts is necessary, along with the broader humanitarian, economic, and environmental costs.

Some of these CO2-related costs stem from military activities. Understanding this is complicated by the long-standing military culture of national environmental exceptionalism and how this has been reflected in United Nations climate agreements, influenced by the United States. The exclusion of military emissions from the 1997 Kyoto Protocol became a voluntary reporting mechanism under the 2015 Paris Agreement. However, when the military began collecting and publishing emissions data for reporting to the UNFCCC (United Nations Framework Convention on Climate Change), it found that very few countries were publishing even the minimum data required by the Ta guidelines. Many countries with large militaries announced nothing.

The best estimates suggest that the military is responsible for 5.5% of global greenhouse gas emissions. If the world's militaries were compared to countries, they would rank fourth in emissions, after India and Russia. The military is heavily dependent on fossil fuels, and net-zero targets have sparked a debate on the decarbonization of the military. However, without understanding the scale of emissions and the national and international political frameworks that support them, effective decarbonization is not possible. Currently, we have neither, yet global carbon-intensive military spending has reached record levels. Ultimately, the international political framework is represented by the UNFCCC. Some militaries have set vague emission reduction targets, often lacking the scope and details needed to demonstrate results. For instance, NATO has developed a methodology for counting emissions, but it does not apply to member states and

specifically excludes emissions from NATO-led operations and missions, as well as training and exercises.

Alongside the ongoing destruction in Gaza, COP28 has placed unprecedented attention on the relationship between the climate crisis, peace, and security. However, military and conflict-related issues were still absent from the official agenda, although they appeared in side events and protests. To bridge this gap between military emissions and conflict emissions, governments must recognize the significant role of armed forces in global emissions and the need for greater transparency. The climate change movement must avoid shying away from these issues, given the growing trend of intersectionality in its lobbying efforts. This depends on the growth of the research community documenting military and conflict emissions and the use of such data by organizations monitoring and reporting on global emissions trends.

For decades, military environmental exceptionalism and restrictive interpretations of climate security have undermined our collective climate security.

There can be no climate justice on occupied land. (Dylan Hamilton, PBS News, 2023)

# **Chapter Three**

# <u>Digital Storytelling: a Bridge between Interculturality and</u> <u>Environmental Sustainability</u>

"How do we change climate change? The number one way is by talking about it. Climate change is effecting everybody right here, right now, in the places where we live. But by working together we can fix it. We have to go out and actively look for the hope that we need that will inspire us to act. And that hope begins with a conversation today." (Katharine Hayhoe, TED, 2018)

# 3.1 Storytelling and Sustainability

Digital storytelling is, as we have seen, a highly powerful tool in intercultural contexts. It facilitates the exchange of thoughts, actions, and ideologies among communities worldwide, fostering a global dialogue on sustainability and addressing deeply rooted and complex issues such as post-colonial dynamics.

Post-colonial issues are among the primary causes of the environmental challenges faced daily by communities in the Global South. Today, however, these communities are not merely addressing the consequences of such crises but are also initiating global dialogues to find solutions aimed at improving the planet and enhancing quality of life.

Digital storytelling serves as a potent instrument to facilitate intercultural exchange and promote global dialogue on sustainability by tackling complex issues like post-colonial dynamics and environmental challenges, particularly in the Global South. Below, we explore how digital storytelling is employed and the benefits it brings to fostering sustainable dialogue:

- Access to Local Voices: Through digital storytelling platforms such as social media, blogs, and video-sharing tools, historically marginalized communities gain a platform to share their stories, experiences, and perspectives on sustainability. This visibility helps reduce the stereotypical or erroneous representation of Global South communities, enabling them to participate more equitably in discussions on critical issues like climate change adaptation.
- Sustainability Dialogues with Historical Context: Colonialism and its legacies persist in today's environmental challenges. Digital resources make it possible to highlight these

connections and foster critical discussions about why and how Global South countries face the most severe impacts of climate change, despite contributing less to historical emissions. This awareness encourages wealthier nations to engage in respectful and mindful support and solutions for sustainability.

- Intercultural Education and Awareness: Digital storytelling can be integrated into school and
  academic curricula, bringing stories of resilience, sustainable agricultural practices, and
  ecological innovations from Global South countries into classrooms worldwide. This
  intercultural approach not only enriches sustainability education but also inspires greater
  accountability among future generations towards climate justice.
- Global Collaboration and Empowerment: Digital storytelling connects Global South
  communities with organizations, activists, and researchers from other regions, creating
  global networks for the exchange of ideas, technologies, and strategies. This collaboration
  promotes localized solutions and sustainable practices tailored to community needs,
  avoiding external interventions that may not align with socio-cultural contexts.

Through these dynamics, digital storytelling not only enhances global dialogue but also fosters sustainability that integrates the perspectives and voices of the most affected communities. Storytelling has always been a powerful medium for sharing knowledge, experiences, and emotions. With the advent of digital technology, it has gained new dimensions, breaking down geographical and cultural barriers. This has created unprecedented opportunities to promote intercultural exchange and raise global awareness of critical issues such as sustainability.

Digital storytelling enables the creation of a global network of dialogue that not only informs but inspires concrete actions. Sustainability and interculturality are not separate themes but are deeply interconnected in various contexts. For instance, the fight for climate justice highlights how climate change disproportionately impacts the most vulnerable communities, often belonging to cultural minorities or less developed regions of the world. Sharing these stories through digital storytelling amplifies their voices and fosters collective action toward a more equitable future. Collaborative projects involving people from diverse cultural backgrounds can promote shared environmental solutions. For example, a digital initiative might document an exchange between students from different countries who jointly explore innovative ways to reduce waste, leveraging local technologies and traditional knowledge.

Digital platforms provide spaces where stories from diverse cultures can intersect. Projects like *Global Voices*, *Concern*, *We Are Water*, and many others collect and share experiences from around the world, making otherwise unknown perspectives accessible. These narratives foster

mutual understanding, reduce stereotypes, and challenge prejudices. For example, a digital story documenting the artisanal traditions of an indigenous community can inspire respect for their culture, preserving and disseminating it globally.

Documenting these accounts not only celebrates cultural diversity but also underscores the importance of sustainable resource management, fostering empathy and awareness. Digital storytelling, therefore, becomes a bridge that connects communities, amplifies their voices, and paves the way for a more sustainable and inclusive future.

#### **GLOBAL VOICES**

Global Voices is an international community of writers, bloggers, and digital activists committed to translating and reporting what is shared on citizen media platforms worldwide. This non-profit initiative originated at the Berkman Center for Internet and Society at Harvard Law School and was launched during the International Bloggers Conference in December 2004. By 2008, Global Voices had become an independent non-profit organization headquartered in Amsterdam, the Netherlands.

When Global Voices was founded, its primary aim was to create and empower a community of "bridge bloggers" who could "connect two languages or two cultures." It subsequently developed tools and resources to better achieve its initial goals and to maintain collaboration with traditional media outlets. In 2012, the organization set the following objectives:

- By integrating text, photography, podcasts, videos, and other grassroots citizen media, to amplify the most compelling conversations and perspectives emerging from citizen media around the globe.
- To encourage the emergence of new citizen voices through training, online tutorials, and promoting how people worldwide can safely use free and open-source tools.
- To advocate for freedom of expression and protect the rights of citizen journalists.

Global Voices operates with a team of regional editors who summarize and curate discussions from various blogospheres, emphasizing underrepresented and non-Western voices. Most of its contributors are volunteers.

#### **CONCERN**

Concern is an international humanitarian organization dedicated to creating a world free from poverty, fear, and oppression. It delivers life-saving and life-changing interventions to the world's poorest and most vulnerable people. From rapid emergency response to innovative development

programs, Concern's volunteers work in the most remote and challenging areas to ensure no one is left behind. The organization implements a range of programs addressing the root causes of extreme poverty in 26 countries, organized around six thematic areas. Concern recognizes that the climate crisis is the greatest global environmental threat and a significant contributor to poverty.

Most people engaged with Concern rely on agriculture or food production. Many of these communities are at the forefront of the fight against climate change. Concern collaborates with rural communities to promote climate-resilient agriculture. This approach helps families adapt by adopting better crops, farming techniques, and soil-improvement practices to respond to changing and often unpredictable environments. Concern's goals include:

- Strengthening relationships with the private sector to facilitate access to supplies and equipment.
- Disaster Risk Reduction (DRR), which protects the lives and livelihoods of communities and individuals most affected by disasters and emergencies. Whether the crisis is caused by natural or human-made events (or a combination), DRR minimizes its negative impact on those most vulnerable. In some cases, it reduces the scale, severity, and even frequency of disasters. DRR also helps at-risk groups, such as women, people with disabilities, the elderly, and those with chronic illnesses, to anticipate, survive, and recover more effectively.

Concern's responses to climate change are tailored to the specific contexts of the communities it serves. A key focus is prioritizing indigenous knowledge and nature-based solutions. These strategies involve protecting, sustainably managing, and restoring natural and modified ecosystems to address societal challenges. Nature-based solutions not only mitigate the immediate environmental degradation caused by climate change but also address challenges such as food security, water availability, public health, and socioeconomic development.

#### WE ARE WATER

The We Are Water Foundation is an initiative of the Roca Group, a global leader in the bathroom sector with a presence in over 170 countries. Since its inception, the company has been committed to environmental protection, both in product development and manufacturing processes. Recognizing water as a unique and limited resource, Roca has spent over 50 years developing cutting-edge devices for water and energy conservation, fostering a more balanced and sustainable relationship with the environment.

The creation of the We Are Water Foundation marks a new level of commitment by the Roca Group, emphasizing solidarity with those affected by water scarcity and inadequate sanitation while striving to mitigate the impacts of this injustice. The Foundation's objectives include:

- Raising awareness of water usage. Promoting the importance of rational water use at both individual and collective levels to preserve this resource for future generations.
- Ensuring access to safe drinking water. Working to provide vulnerable communities with potable water, thereby reducing child mortality, infectious diseases, and social inequalities.
- Improving hygiene. Supporting projects to build and enhance essential sanitation infrastructure, fostering dignified living conditions, and preventing disease outbreaks.
- Promoting education and international cooperation. Organizing awareness campaigns and collaborating with NGOs, organizations, and local governments to implement sustainable, long-term solutions in water-scarce areas.
- Adapting to climate change. Working to mitigate the impacts of climate change on water resources and helping communities develop adaptation strategies.

These organizations exemplify how volunteers dedicate themselves to addressing environmental challenges and supporting the most affected communities. The use of digital tools and platforms significantly enhances the promotion of their efforts.

What unites environmental organizations is their focus on impactful activities, such as awareness campaigns, including conferences, documentaries, and international events to stimulate global dialogue on environmental challenges. Then again humanitarian projects in partnership with global entities like UNICEF to provide access to water and improve living conditions for thousands worldwide. And Finally research and development to foster innovative technological solutions for the sustainable use of the planet's resources.

### **Promoting Dialogue on Sustainability**

Digital storytelling serves as an effective medium for addressing global challenges such as climate change, biodiversity loss, and the responsible use of resources. Through videos, podcasts, blogs, and social media, individuals and organizations can share stories of success, struggles, and innovative solutions.

For instance, interactive documentaries often explore the environmental and social impacts of fast fashion, encouraging viewers to reflect on their consumption habits. By leveraging digital storytelling, these messages have reached millions across different languages, sparking global conversations on sustainability. Similarly, campaigns like *Earth Hour* use videos and imagery on social media to inspire millions worldwide to turn off their lights for an hour, symbolizing a collective commitment to the planet. These visual narratives foster a sense of global community, demonstrating that even small actions can have a significant impact.

Digital storytelling also facilitates collaboration between countries and communities. Platforms like *TED Talks* showcase stories from around the world, offering insights into how different cultures tackle common problems. For example, a presentation on waste management in Sweden can inspire similar initiatives in other nations, adapted to local contexts.

Another notable example is the *Digital Green* project, which uses video content to teach sustainable farming techniques to farmers in India and Africa. These videos, created by members of local communities, enhance cultural relevance and message effectiveness, improving crop yields while reducing environmental impact. Similarly, the Italian initiative *Treedom* collaborates with small farming communities, local organizations, and NGOs in countries such as Tanzania, Ecuador, Kenya, Italy, and Haiti. Customers who purchase a tree entrust its growth to local farmers in the designated planting area. In this way, they not only contribute to reforestation efforts but also support the socio-economic development of the selected region.

#### The Stakeholders of Climate Change

Climate change represents one of the most pervasive and cross-cutting challenges of our time, affecting every sector of society, from the most vulnerable to the most influential. From protecting indigenous tribes in remote regions such as the Amazon to addressing sustainability in modern urban centers like Kigali, Rwanda, the issue of sustainability transcends boundaries and highlights the urgency of transitioning to a sustainable development model.

Sustainability is not a novel concept but is rooted in the historical management of resources. For example, treaties and laws on the protection of waterways and fisheries rank among the oldest international legal instruments on record. However, a critical question remains: who bears the responsibility for deciding how to address climate change and promote sustainability?

Governments play a pivotal role in regulating and implementing necessary measures to combat climate change. Armed with binding legal authority, they are tasked with prioritizing public interest. Yet, policy decisions have often been driven by economic exploitation of nature, neglecting

key indicators such as public health, quality of life, and long-term sustainability. A striking example is the continued subsidies for fossil fuels, which underscore the failure of many governments to transition away from reliance on non-renewable energy sources.

Government actions, often shaped by social and electoral dynamics, can nevertheless be transformed through pressure exerted by social movements and civil society. Contrary to the criticisms of collective public action, history demonstrates that social movements have achieved significant victories in social and environmental domains, such as the abolition of nuclear testing in the Pacific and the ban on international ivory trade.

Civil society, composed of non-governmental organizations, individuals, and informal groups, serves as a driving force for promoting sustainable change. Through a combination of advocacy, public awareness campaigns, and pressure on policymakers, these entities influence governmental priorities, funding allocations, and policy frameworks. Civil society acts not only as a moral compass but also as a source of innovation, offering solutions ready for testing and implementation.

Businesses, particularly those in the private sector, have historically played a significant role in creating economic value. Since the 14th century, with the rise of merchants and the decline of exclusive noble power, the private sector has assumed a central position in society. However, their growing influence comes with an increased responsibility to address climate change and environmental degradation.

Corporations control a substantial share of global operational capacity and hold the potential to transform entire sectors through strategic decisions. Yet, many businesses significantly contribute to pollution. A recent study revealed that Coca-Cola, PepsiCo, and Danone account for 14% of "brand contamination," highlighting their role in environmental crises.

The individual differs from all other groups as the foundational unit from which all subsequent groups are formed. Each person is simultaneously a member, expert, colleague, and participant in various committees and forums. Ultimately, all social structures—from board game clubs to families, corporations, and governments—are created and sustained by individuals. These structures exist only because enough individuals believe in them. At the core, the responsibility for addressing climate change rests on the shoulders of every person and every leader.

The fight against climate change demands a joint and coordinated effort from governments, civil society, and the private sector. Each stakeholder must acknowledge and assume their share of responsibility, working together to achieve an equitable and sustainable transition. Collaboration among these entities is crucial to building a future that balances economic growth, environmental sustainability, and social well-being.

# 3.2 Engaging Climate Change Communication

Over the past three decades, reports from the Intergovernmental Panel on Climate Change (IPCC) have emphasized the urgency of global-scale social and political transformations to ensure a sustainable and resilient future. These transformations require robust public support, underscoring the critical role of climate change communication. Addressing this challenge, the Climate Communication Project and Climate Outreach have published a report analyzing the current state of climate communication in the United Kingdom, offering practical recommendations to enhance the effectiveness of public engagement initiatives.

The report, based on an extensive consultation involving approximately 200 experts—including researchers, academics, journalists, activists, and artists—serves as an "audit" of the climate communication landscape in the UK. Through a consultative workshop inspired by the collaborative processes of the IPCC, the project tackled key questions such as: What objectives should guide climate action? What principles should underpin its implementation? And, critically, how robust is the science of climate change communication? The findings, presented in the document *Climate Communication in Practice*, provide a clear framework of current communication practices and propose strategies to improve public engagement.

The research highlights that there is no single motivation driving climate change communication. Instead, a combination of factors influences how the public interacts with the issue. The survey revealed that about a quarter of professionals in the field are highly active, participating in more than a dozen initiatives annually. However, there remains a strong reliance on traditional "speaker-listener" communication formats, which often limit engagement effectiveness. This approach falls short of capturing the public's attention and fostering sustained support.

A key consensus among experts is that climate communication should be grounded in robust scientific evidence while also incorporating persuasive techniques to advocate for concrete policies and actions. Nevertheless, the primary challenge lies in making climate change relevant to people's daily lives by establishing a direct connection between climate issues and matters the public perceives as important, such as health, politics, and everyday activities.

The report identifies three main areas for improving climate change communication practices:

1. Audience Empathy: It is crucial to understand the values, beliefs, and attitudes of the audience before undertaking engagement activities. This requires tailoring messages to the

- specific characteristics of each group, using accessible language, and, where possible, involving trusted communicators who understand the audience's concerns.
- 2. Personalization and Relevance: Engagement activities must be personally relevant, demonstrating how climate change directly impacts individuals' lives. Linking the issue to everyday concerns and urgent problems can significantly enhance communication effectiveness.
- 3. Specialized Engagement: The report advocates moving beyond generalized efforts targeting a broad, indistinct audience, instead favoring targeted and specialized engagement. This approach allows for addressing the specific needs of different groups and fostering a deeper understanding of climate issues.

The document *Climate Communication in Practice* marks a significant step toward more effective climate communication in the United Kingdom. It underscores the necessity of transcending traditional methods and adopting innovative, targeted strategies to engage the public more deeply. Through empathy, personalization, and specialized engagement, climate communication can be transformed into a powerful tool for mobilizing public support and driving concrete action.

#### **Climate Change Communication Strategies**

An effective approach to climate change communication requires proactivity and a "balanced optimism," a perspective that acknowledges both the severity of the challenges and the opportunities for successfully addressing them. To capture the audience's attention, it is crucial to use engaging communication tools such as compelling visuals, narratives, storytelling, and humor. These elements not only make communication more captivating and memorable but also help foster hope and motivation in tackling climate issues.

Mutual dialogue is another key component. Rather than adopting didactic or prescriptive approaches, communicators should encourage a process of shared learning, promoting the cocreation of solutions. This fosters deeper engagement and a stronger sense of ownership among the audience.

Promoting change through individual and collective empowerment is essential. Communicators can support the public in understanding which concrete actions they can take to combat climate change, thereby enhancing confidence in their ability to make a difference. This approach strengthens both political commitment and personal initiatives, creating a synergistic effect between individual and collective efforts in addressing climate change.

### The Climate Crisis and the Challenge of Communication

In the summer of this year, Western Canada and the United States experienced unprecedented temperatures, described with superlatives that emphasize the exceptional nature of the event. The community of Lytton, in British Columbia, reached a peak of 49.5°C on June 29, marking the third consecutive record high temperature. While this data understandably shocked and dismayed many, it is less surprising to the scientific community. For over forty years, scientists have warned of the direct link between global warming and the intensification of extreme heat events. In this context, terms such as "normal" and "new record" risk losing their meaning.

However, the narrative that attributes collective blame for past climate inaction, while understandable, does not prove constructive in addressing the crisis. Rather, a paradigm shift in climate change communication is needed to mobilize a timely and adequate response.

A key first step in enhancing awareness and action on the climate crisis involves increasing the time and attention devoted to this issue in the media and public conversations. Despite global warming being the most severe emergency humanity has ever faced, media coverage remains dramatically insufficient. In the United States, in 2022, only 0.4% of top news stories were about climate change, a drop from 0.7% in 2019. This lack of coverage persists even in the face of extreme events, such as the record heatwaves that struck California and Yukon.

The relationship between information and action is complex. An approach that is merely informational is not sufficient to overcome the cognitive and political barriers that hinder the perception and response to climate change. Providing more data or facts to those with strong ideological incentives to ignore the crisis will not necessarily lead to greater engagement.

Climate change is an intrinsically complex narrative. It is perceived as a problem too vast, frightening, and distant to be solved by a single individual. To translate awareness into commitment and, subsequently, into political action, it is necessary to present the climate crisis as a personal, concrete, understandable, and, most importantly, manageable issue. In this sense, charts, tables, and symbolic images like polar bears, while powerful, often fail to establish an emotional and practical connection with the audience.

#### The Need for a Solution-Oriented Narrative

For the message about climate change to be effective, it must go beyond mere denunciation of the problems, instead focusing on solutions and the tangible benefits these can bring to people's daily lives. It is significant to note that while 83% of Canadians acknowledge global warming as a real

phenomenon, only 47% believe it can cause personal harm. This gap highlights the need to make climate change an issue perceived as relevant and urgent at the individual level.

Communication must therefore shift from an abstract, alarmist approach to a more practical and optimistic one. Talking about how efforts are being made to address the crisis and how these solutions can improve quality of life is crucial. Such conversations transform abstract and frightening issues into everyday realities, making them not only understandable but also solvable. The solution is important. Environmental communicators have long identified the overuse of fear-based messaging about climate change as one of the main challenges in engaging the public on the issue.

The challenge is to combine fear communication with information about effectiveness: what people can actually do to alleviate their fears. The combination of fear and effectiveness provides what is called "threat control," rather than simply "fear control" measures.

In the case of COVID-19, the effectiveness of handwashing, social distancing, masks, etc., was clear. In the case of climate change, information about effectiveness is less clear and harder to implement. It is often argued that major emitters, particularly fossil fuel producers, bear the greatest responsibility and should be held accountable for remediation. The Guardian emphasizes that 100 companies are responsible for 71% of emissions.

It is clear that the world must stop burning fossil fuels like oil, gas, and coal. To achieve this goal, individuals can also model environmentally friendly behaviors. It can be as simple as posting a photo of your local clean-up or nature walk, or sharing on social media the eco-friendly things you do, such as using public transportation. This form of communication normalizes the urgency, importance, and potential of planet protection, in contrast to images promoting high-carbon lifestyles. Some of the most effective communicators include weather forecasters with loyal followers. More and more people are discussing how to tackle the climate crisis in the places where they live.

Risk communication, including that related to the climate crisis, is often structured around moral obligation standards, i.e., messages that prescribe what a person should do to avoid negative consequences. However, this approach is frequently ineffective. An emblematic example is the signs in parks urging visitors not to feed ducks, emphasizing that human food is harmful to these animals. Despite this, many continue to ignore such warnings. This type of communication, based on a moral imperative, struggles to change ingrained behaviors.

A more effective alternative is to adopt so-called "descriptive social norms," that is, descriptions of positive behaviors that others similar to the target audience are already successfully engaging in. This approach, based on the emulation of socially approved behaviors, has shown

more promising results. For instance, in the UK, a 2015 campaign encouraged citizens to "take your trash home, just like everyone else does." This message proved more effective in reducing illegal dumping compared to traditional signs simply urging people not to litter.

Solutions, especially when presented through narratives that highlight the engagement of individuals or communities, serve as a powerful tool for raising awareness and motivating public opinion. A notable example is the *First Nations Forward* series, published by the National Observer, which tells the story of how Indigenous communities in British Columbia are playing a central role in the transition to a future powered by renewable energy. These narratives demonstrate that active participation in climate change mitigation is not only possible but already underway.

Mainstream media are also beginning to pay more attention to this perspective. For instance, *Global News* recently published articles documenting large-scale energy transitions in Alberta, highlighting initiatives that are already operational. These reports convey a clear message: collective action to tackle the climate crisis is not only feasible but also normal and inspiring.

### **Climate Change Misinformation**

For the first time, the Intergovernmental Panel on Climate Change (IPCC) has recognized climate misinformation as a significant obstacle in the fight against global warming, particularly in the United States. A recent report by Stop Funding Heat revealed that such misinformation often designed to deceive or confuse—can reach up to 1.36 million views on Facebook in a single day. Furthermore, this issue is worsening across various social media platforms, amplifying the challenge of distinguishing between fact and fiction regarding climate issues.

Climate misinformation manifests in various forms, ranging from naively shared social media posts to intentionally misleading reports funded by fossil fuel lobby groups. The consequences of these falsehoods include public confusion, social polarization, and impediments to government policy. As Sujatha Bergen of the NRDC states, "Climate misinformation is at best a distraction and, at worst, a barrier to urgent action." Effectively addressing this challenge requires an understanding of the evolution and tactics of misinformation, coupled with targeted strategies to mitigate its impact.

A decade ago, climate misinformation largely focused on outright denial of climate change and the scientific evidence of global warming. Today, tactics have evolved into more subtle forms. According to John Cook, a cognitive scientist at the Monash Climate Change Communication Research Hub, the focus has shifted toward denying solutions. Misleading arguments—such as claims that climate policies harm the economy or that scientists are unreliable—aim to delay climate action. Another prevalent form of misinformation is *greenwashing* (explored in subsequent sections), wherein companies, especially in the fossil fuel sector, publicly promote net-zero goals without implementing meaningful measures to reduce their environmental impact.

Addressing misinformation requires understanding its primary techniques, summarized in the FLICC model:

- Fake Experts: Presenting unqualified sources as authoritative.
- Logical Fallacies: Drawing conclusions unsupported by premises.
- Impossible Expectations: Demanding unrealistic levels of proof before action.
- Conspiracy Theories: Suggesting hidden plots to obscure the truth.
- Cherry-Picking: Selecting data that supports a narrative while ignoring contradictory evidence.

Cook has developed educational tools, such as the *Cranky Uncle* app, to help the public recognize these techniques. Research demonstrates that increasing awareness of manipulation strategies reduces susceptibility, regardless of political affiliation.

Countering climate misinformation demands active and informed engagement. Effective strategies include:

- 1. Verify Before Sharing: Prevent the unintentional spread of falsehoods by fact-checking information before sharing. While much misinformation spreads accidentally, its negative impact remains significant.
- 2. Use the "Truth Sandwich" Method: To debunk falsehoods, begin with a truthful statement, refute the myth, and conclude by reiterating the truth. This minimizes the likelihood of the misinformation being absorbed by the audience.
- 3. Report Misinformation: Social media platforms provide tools to flag misleading content. Reporting such posts helps curb their dissemination. Tech companies have already demonstrated, in contexts such as COVID-19 and elections, that they can act effectively when motivated.
- 4. Advocate for Proactive Policies: Contact policymakers to support legislative measures against misinformation and advocate for more ambitious climate policies.

Combating Misinformation ia a Global Priority. The stakes could not be higher: a polarized population on climate solutions and policies hinders progress toward meaningful action. As Cook emphasizes, "Ignoring climate misinformation is something we do at our peril." To secure a

sustainable future, it is imperative to confront this issue decisively, educate the public, and promote dialogue rooted in facts and actionable solutions.

## The Power of Language in Addressing the Climate Crisis

Humanity has demonstrated an extraordinary capacity to confront significant challenges when we unite, particularly when the well-being of our loved ones is at stake. This ability to collaborate effectively is key to tackling the vast challenges presented by the climate crisis. A crucial element in overcoming these challenges lies in the way we discuss climate change, as the language we use has a profound impact on how people think, feel, and act. Recent research indicates that the way we frame the climate crisis can shape public perception and influence collective behavior.

To explore this concept further, a study was conducted in which the public was asked a straightforward question: "Can we fix the climate?" This question was posed twice, with differing approaches to the framing of the issue. The first time, a positive narrative was presented, emphasizing the collective success during the COVID-19 pandemic, where governments acted decisively, and society demonstrated resilience. In response, many individuals expressed optimism. They noted that if humanity could overcome such a crisis, the climate crisis was not insurmountable. The public acknowledged the importance of reducing resource consumption, as demonstrated by the temporary reduction in pollution during lockdowns, and believed that continued effort could lead to meaningful progress. They felt that change was possible if people persevered, even if it required challenging long-established systems.

Conversely, when the same question was posed with a negative framing, focusing on the severity of the climate crisis, the failures of political leaders, and the lack of sufficient action, the responses were far more pessimistic. Many expressed doubt that the necessary global cooperation would occur, given the current state of the world. Some individuals voiced a sense of resignation, believing that the current trajectory would lead to worsening conditions, with humanity ultimately receiving the consequences of its actions. Others stressed the need for top-down leadership to address the crisis, yet remained unconvinced that meaningful change would occur under the current political landscape.

These contrasting responses highlight the significant influence that language has on public attitudes toward climate action. The research suggests that when we focus solely on the overwhelming scale of the problem, it can lead to feelings of helplessness and discourage engagement. This effect was evident in the responses to the negative framing of the climate crisis, where individuals felt disempowered and doubtful about the possibility of effective action.

To foster a more proactive and optimistic approach to climate change, it is essential to communicate in a way that emphasizes the potential for positive change. While it is crucial to acknowledge the challenges ahead, it is equally important to highlight the fact that solutions are already being implemented and that progress is being made. This concept, known as "normalizing action," encourages the belief that climate change is not an insurmountable problem, but rather one that is within our capacity to address. Showing that change is already occurring can inspire others to take action and build momentum toward broader systemic change.

In summary, the way we talk about climate change matters. By shifting the focus from overwhelming challenges to achievable solutions, we can motivate individuals and communities to engage with the issue in a meaningful way. Experts have identified six key strategies to communicate more effectively about the climate crisis, and these are available in a free downloadable PDF. By sharing these insights widely and using our voices to advocate for positive change, we can contribute to the collective effort to heal the planet and secure a sustainable future for all.

## **Mobilization Through Storytelling**

Success stories in combating the climate crisis not only inform but also inspire. They communicate that change is achievable and that pro-environmental behaviors can be adopted by a growing number of individuals already alarmed or concerned about the implications of climate change. These narratives move away from traditional portrayals based on fear or debates with skeptics and deniers, instead focusing on shared values and concrete solutions.

Promoting stories of effective change helps mobilize the public toward action. These narratives meet people "where they are", making climate issues more personal and accessible. Unlike reports characterized by catastrophic tones, which often generate anxiety and paralysis, positive narratives foster a sense of efficacy and hope, making the climate crisis a problem that can be confronted and solved.

It is time to achieve a net-zero economy, to find solutions and policies in the sustainability sector, and to develop ideas that will truly shift the framework of how we can create a "nature-positive future." The most significant progress is being made in high-emission sectors.

FabricNano, a biotech startup, has developed a method to sustainably synthesize bioplastics and fossil-fuel-free chemical ingredients at scale, producing these chemicals 100 times faster than conventional petroleum-based products. These breakthroughs could allow cell-free manufacturing to transition from a niche concept to a widespread practice.

After a highly successful retrofit of the Empire State Building in New York City, a program called the Empire Building Challenge is providing \$50 million in funding to high-rise building owners to pilot innovative retrofit solutions.

While new buildings are relatively easy to make sustainable, old buildings account for 80-90% of energy usage, and this is where we need to focus on achieving sustainability gains. The most successful solutions will be shared widely with other building owners across New York State, creating a network of sustainable practices.

The concept of generating electricity from human-powered steps has been around for a while but has seen limited market adoption. However, new technology developed by two Swiss labs electricity to be generated from wooden flooring for the allows Wood, one of the most sustainable and popular building materials, has largely been ignored for energy harvesting due to its electro-neutrality. These scientists have found a way to modify wood with silicone and nanocrystals using relatively environmentally friendly procedures, making it triboelectric.

What if we could grow wood in a lab? Researchers at MIT have not only discovered how to replicate wood by isolating tunable plant tissues but also how to grow it in specific shapes, thereby reducing waste. Even though wood can be grown sustainably, this new technology has the potential to transform our use of biomaterials and combat deforestation. Making affordable fashion sustainable is the goal of this global e-commerce brand. Everything is handmade to order in Spain and Portugal.

Most importantly, they only produce what is ordered, significantly reducing unsold production waste. For every item ordered, they encourage customers to resell something they no longer want. They also offset their carbon footprint and donate material scraps to independent fashion brands. With an annual growth rate of 100%, this pioneering stockless fashion brand is on the rise. Buying carbon credits to meet sustainability goals will not fully lead us to Net Zero. Nature-positive business solutions require placing a price on "negative externalities." Two companies are helping to achieve this.

NCAVES, a UN-funded research project, is laying the groundwork for environmental and ecosystem accounting. With pilots in Brazil, China, India, Mexico, and South Africa, the project is developing tools, language, and frameworks for measuring the value of ecosystem services. Similarly, InVest has created a set of modeling tools to assess the impact of investments in natural infrastructure in cities. The software models the links between nature and the well-being of populations, demonstrating how investors can become allies to nature. Investing in nature can also mean investing in nature itself. Costa Rica is the first tropical country to

halt and even reverse deforestation. By taxing fossil fuels, the government has financed a \$500 million payout to landowners—saving more than 1 million hectares of forest and replanting 7 million trees. While many good programs exist globally, Costa Rica has been recognized as one of the most successful due to political will and a strong commitment to the environment.

## 3.3 Greenwashing

As mentioned above, *greenwashing* refers to companies, particularly in the fossil fuel sector, that publicly promote net-zero emissions goals without implementing meaningful measures to reduce their environmental impact.

Stakeholders and society, in general, demand transparent disclosure of information regarding the environmental impact of corporate activities. This communication should be dynamic and delivered through various channels with the aim of raising awareness. The Federal Trade Commission specifies that general environmental claims must use clear and conspicuous language to indicate that they refer only to one or more specific and limited environmental benefits.

The advent of Web 2.0 has introduced new social media tools and enabled parties to engage in new forms of interaction and information exchange on the internet. Corporate webpages and blogs, forums, petition websites, and especially social networks like Twitter and Facebook are redefining the interaction and communication between companies and their stakeholders.

In recent years, the concept of sustainability has become central to corporate marketing. Over 60% of consumers state that they would pay more for products with sustainable packaging. This reflects a global trend toward preferring goods perceived as environmentally friendly. Between 2017 and 2022, sales of consumer goods with sustainability messaging in North America grew by over 30%, reaching approximately \$268.9 billion. However, despite these promising figures, many companies fail to uphold their environmental promises, leading to accusations of *greenwashing*, the practice of misleadingly advertising a sustainable image.

## What Is Greenwashing?

Greenwashing occurs when an organization uses deceptive advertising to present itself as more environmentally responsible than it truly is. Interest in sustainable investments (ESG), which

consider environmental, social, and corporate governance factors, has grown exponentially over the last decade, surpassing \$350 billion in net assets in 2021. This phenomenon highlights how economically advantageous it has become for companies to be perceived as environmentally beneficial.

However, this economic and social pressure can lead to non-transparent practices. A notable example involves H&M, whose Conscious Choice brand was accused in 2022 of advertising sustainable materials that did not meet the claimed standards. Although the company denied the greenwashing allegations, the case illustrates how a lack of transparency, weak goals, and extended timelines are common signs of such practices. Criticism of greenwashing focuses on three main aspects:

- 1. Unambitious goals: Many companies commit to reducing emissions but fail to provide concrete details on how they will achieve these targets.
- 2. Limited transparency: Consumers often do not have access to clear information regarding the real environmental impact of corporate actions.
- 3. Unrealistic timelines: Long-term commitments, such as the promise to reach net-zero emissions by 2050, may lack intermediate goals, making it difficult to monitor progress.

An illustrative case concerns the use of carbon offsets, tools through which companies fund projects such as reforestation or renewable energy to compensate for their emissions. While theoretically valid, many of these projects fail to effectively remove greenhouse gases from the atmosphere, generating criticism from activists and environmentalists.

Regulation of greenwashing is becoming a priority for governments, especially in Europe and the United States. In March 2022, the European Union introduced proposals to require companies to support their environmental claims with independently verified scientific evidence. This effort aims to facilitate consumers' choice of sustainable products and could influence global practices, as multinational corporations tend to align with regulations applicable to broad markets.

In the United States, the Federal Trade Commission (FTC) is evaluating new rules to regulate environmental marketing claims, with the goal of penalizing companies for using misleading language. The Securities and Exchange Commission (SEC) is also proposing stricter transparency requirements for ESG funds.

Greenwashing represents a significant challenge in the transition toward a more sustainable economy. The increasing demand for eco-friendly products and the pressure to improve environmental image have made sustainability a key element of corporate strategies. However, without rigorous and transparent regulation, the risk of manipulation and false promises remains

high. It is crucial that governments, consumers, and investors collaborate to promote genuinely sustainable practices and discourage greenwashing.

## **Corporate Efforts to Combat Greenwashing**

World-renowned products manufactured by Europe's largest food company line supermarket shelves. Despite their widespread operations, these companies often claim to be leaders in the fight against plastic pollution. Public statements emphasize sustainability efforts with claims like "We are committed to making our packaging and operations more sustainable" or "Becoming ecofriendly is great." However, the reality is quite different. These companies are among the largest producers of plastic waste globally.

In 2019 alone, approximately 350 million tons of plastic waste were generated worldwide, of which only 9% was recycled. The rest often ends up in oceans, soil, and even the atmosphere, with devastating effects on ecosystems and health. This raises important questions: When companies promise to reduce plastic waste, do they keep their promises?

Reports from experts at the European Data Journalism Network have highlighted a troubling picture: many companies promise too much and deliver little. For instance, Danone, a global leader in bottled water, repeatedly revised its goals for the amount of recycled PET (polyethylene terephthalate) in its bottles. The initial commitment was to use 20-30% recycled PET by 2011, but the target was later postponed to 2020 and then to 2025. In 2020, Danone's global average consumption of recycled PET was only 19.8%. This pattern is not exclusive to Danone. In 2020, Nestlé achieved only 5% recycled PET, while Coca-Cola Europe reached 9%. Such examples indicate a broader trend. Companies often focus on changing targets rather than taking concrete actions. This is where digital information plays a role. For example, Anheuser-Busch InBev, producer of well-known beer brands such as Budweiser and Corona, launched an ambitious beach cleanup campaign and products made from recycled ocean plastic. However, these efforts were largely symbolic and did not provide a permanent solution to plastic waste.

Critics like Larissa Copello of Zero Waste Europe argue that such measures distract from the root cause of the problem: the overproduction of plastic packaging. As Copello rightly states: "We need to turn off the tap." Instead of addressing the causes, companies focus on easy-to-market solutions that often have limited long-term impact.

Only 20% of the initiatives analyzed aimed to reduce plastic use. More common are promises to make packaging recyclable, but the lack of adequate recycling infrastructure

undermines such efforts. Most packaging materials, especially those that are not PET, remain difficult to recycle and often end up being incinerated, landfilled, or thrown away.

Even when companies prioritize recycled materials, the focus remains on PET, which is usually the easiest plastic to recycle. However, PET makes up only 17% of all plastic packaging. The remaining 83% consists of hard-to-recycle materials such as polypropylene and low-density polyethylene (LDPE). Therefore, companies emphasize incremental success while ignoring the broader issue of waste.

#### Role of Law

Despite the shortcomings of voluntary initiatives, progress has been made through binding legislation. For example, the European Union's Single-Use Plastics Directive bans certain single-use plastic products and sets binding targets for recycled content in plastic bottles (25% by 2025 and 30% by 2030). These measures demonstrate that applicable regulation is more effective than voluntary efforts to strengthen corporate responsibility. NGOs like Changing Markets argue that even less binding targets can push companies to act. Voluntary initiatives are not enforceable, so companies often fail to meet their goals without external pressure.

In conclusion, reversing the trend of plastic pollution is only possible through a combination of legislation, corporate responsibility, and consumer protection. The urgency of this challenge requires immediate and collective action.

#### The Use of Digital Tools to Address Carbon Footprint

In recent decades, the concept of the carbon footprint has emerged as a prominent indicator for measuring the environmental impact of human activities. Its widespread adoption has been supported by media campaigns, digital tools such as personalized calculators, and a narrative urging individuals to reduce their contribution to global emissions. However, this emphasis on personal responsibility raises critical questions: To what extent does individual behavior impact climate change? And how much of this pressure stems from deliberate strategies by the industries most accountable for the problem?

The idea of the carbon footprint originates from the academic concept of the ecological footprint, developed in the 1990s to describe humanity's overall impact on the planet. Subsequently, the fossil fuel industry, particularly British Petroleum (BP), repurposed this concept as a powerful marketing tool. Through global advertising campaigns, BP introduced a calculator that allowed

users to measure their carbon footprint. This shift in focus from major emitters to individual responsibilities fostered a culture of personal guilt, diverting attention from the central role of corporations and government policies in the climate crisis.

This strategy is not isolated. Academic studies reveal that oil companies have employed public relations tactics similar to those used by the tobacco industry, which historically downplayed the risks of smoking by emphasizing consumer choice. Likewise, companies such as ExxonMobil have employed phrases like "energy demand" and "overall emissions" to dilute their direct responsibility, even while internally acknowledging the devastating impact of their products on the climate. This rhetoric distorts perceptions, reframing the problem as one of consumer behavior rather than structural market dynamics and weak regulatory frameworks.

Despite growing awareness of such manipulations, the narrative of personal responsibility remains dominant. Yet data tell a different story. Approximately 71% of global emissions are attributable to just 100 major producers, with the four largest private energy companies responsible for 11% of global CO<sub>2</sub> and methane emissions since 1965. These figures underscore the disparity between the impact of individual actions and that of large-scale industrial activities.

However, this does not render personal choices irrelevant. According to the International Energy Agency (IEA), 55% of the reductions required to achieve decarbonization by 2050 will depend on a combination of government interventions and individual decisions, such as adopting electric vehicles, installing heat pumps, and improving household energy efficiency. While these actions require public policy support, they can also shape market demand and incentivize technological innovation.

Digital technologies play a crucial role in this context. Tools like online calculators and educational apps can raise awareness and guide consumers toward more sustainable lifestyles. However, it is essential that these tools are accompanied by a critial understanding of their origins and limitations. Without systemic analysis, there is a risk of perpetuating a narrative that overemphasizes individual responsibilities at the expense of collective and structural solutions.

Ultimately, addressing climate change requires a balance between individual awareness and collective action. Digital technologies can be powerful allies in fostering this awareness, but they must be used transparently and with integrity to avoid becoming tools of distraction. True climate transformation will only be achieved when governments, businesses, and citizens collaborate to tackle the root causes of the crisis.

Many human activities generate greenhouse gases, including electricity production, transportation, food cultivation, building heating, and the manufacturing of materials such as steel and cement. If the objective were to reduce emissions by 10%, one could simply aim to limit these

activities. However, the 2050 target is far more ambitious: achieving net-zero greenhouse gas emissions. To reach this goal, it is essential to develop alternatives that enable these activities to be performed without emitting greenhouse gases and to do so at costs competitive with traditional methods.

A key concept in this process is the "green premium," which refers to the additional cost of adopting sustainable solutions. For instance, green jet fuel carries a particularly high green premium. In the United States, a gallon of conventional jet fuel costs an average of \$2.20, while biofuel—produced from plant materials, biological waste, or algae—costs approximately \$5.35 per gallon. This represents an increase of \$3.15, more than double the standard cost.

The green premium thus becomes a tool for assessing how far we are from making sustainability a practical and accessible choice. Where the green premium is highest, such as in the case of jet fuel, greater resources must be allocated to research and development and to supporting innovative companies capable of reducing these costs.

Making sustainable products and services economically competitive is critical to achieving the net-zero emissions goal by 2050. Only by lowering the green premium to near zero can we ensure an effective and widespread ecological transition, addressing the most urgent challenges of climate change.

## 3.4 The Impact of Digital Storytelling on Youth

Young people are particularly receptive to messages transmitted digitally. Platforms like TikTok, Instagram, and YouTube have been used to share stories about the climate crisis, such as those of young activist Greta Thunberg. These messages inspire millions of young people to become agents of change in their communities, demonstrating how digital storytelling can have a tangible impact.

Younger people – Millennials and adults in Generation Z – stand out in a new Pew Research Center survey particularly for their high levels of engagement with the issue of climate change. Compared with older adults, Gen Zers and Millennials are *talking* more about the need for action on climate change; among social media users, they are *seeing* more climate change content online; and they are *doing* more to get involved with the issue through activities such as volunteering and attending rallies and protests.

Dr. Doug McNeall, a climate scientist from the Met Office, emphasizes the severity of the threat posed by climate change, highlighted by extreme events such as temperatures exceeding 40°C in England and prolonged droughts in certain areas. Despite the overwhelming evidence, platforms like TikTok often amplify false or misleading information on the topic.

Roshan Salgado D'Arcy, a climate change expert with personal ties to Sri Lanka, one of the most vulnerable countries to climate impacts, uses social media to combat misinformation by analyzing viral content and comparing it with scientific evidence. However, D'Arcy highlights how TikTok's very architecture, which facilitates the rapid spread of content without sufficient controls, fosters the proliferation of erroneous arguments. In response to these challenges, TikTok has adopted a policy to remove content that denies scientific consensus on climate change, collaborating with fact-checkers and suspending accounts that spread false information. However, a study has shown that most of the videos flagged as misinformation remain visible, accumulating millions of views. Although TikTok has since removed some of this content and suspended numerous accounts, the issue persists. McNeall reflects on the effectiveness of this approach, suggesting that, in addition to removing harmful content, it is crucial to actively promote scientifically accurate information to raise public awareness about the risks of climate change and its implications.

Storytelling allows for the collection of stories from experts. However, this is a cumbersome and costly process, and constructing a story is a highly complex task. Hence, the need to digitize the collection of narrative fragments, code stories to facilitate their use, and systematize the way they are circulated. Storytelling is not a single flow driven by a collection of micro-stories gathered by teams, but rather a multiplicity of discursive centers structured by how stories are recorded and the procedures used to transcribe and redistribute them.

Youth understand that climate change is not only an environmental crisis but also a social justice issue. By prioritising climate justice, inclusive education, mental health support and global collaboration, they are shaping a movement that addresses systemic inequalities and empowers future generations to create a sustainable and equitable world.

Although forms of political engagement such as voting tend to be more prevalent among older generations, data reveals a notable level of activism among younger demographics. Approximately 32% of Generation Z and 28% of Millennials have participated in at least one of four key activities aimed at addressing climate change—these include making donations, volunteering, contacting elected officials, or attending protests—within the past year. In contrast, the proportions for Generation X (23%) and Baby Boomers or older adults (21%) are comparatively lower.

When examining online engagement with climate change-related content, Generation Z displays a particularly heightened emotional response, often characterized by anxiety about the future. Among social media users, a majority of Gen Z respondents reported feeling anxious the last time they encountered climate change content. In comparison, a smaller proportion of Millennial

users expressed similar feelings, and less than half of Generation X, Baby Boomers, and older social media users reported the same reaction.

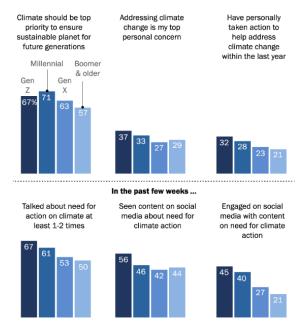
For those actively engaged with climate issues on social media—individuals who follow climate-related accounts and interact, post, or share content on the subject—the emotional responses are notably strong. A significant portion of this group expressed anger, particularly frustration over perceived inaction to address the crisis. Nonetheless, these active users also demonstrated a willingness to learn more about the issue and expressed optimism that the effects of climate change could be mitigated through appropriate actions.

Generational differences in climate change attitudes and actions are not solely a reflection of political alignment, though younger individuals tend to lean toward the Democratic Party more than the Republican Party. Even within Republican constituencies, notable generational disparities emerge. For example, 49% of Gen Z Republicans and 48% of Millennial Republicans reported a greater sense of urgency and willingness to take action to reduce the effects of climate change. In contrast, significantly fewer Republican respondents from Generation X, Baby Boomers, and older generations reported similar levels of concern or intent to act.

These findings underscore the complex interplay between generational identity, political orientation, and climate change attitudes, revealing both broad trends and significant intragenerational variations. This suggests that addressing climate change requires tailored strategies that acknowledge and leverage the distinct motivations and concerns of different demographic cohorts.

Young people should be afforded the opportunity to engage with decision-makers and participate in meetings and forums where climate-related decisions are made. By granting them a seat at the table, their thoughts and ideas can contribute to shaping policy and action. Opportunities should be provided to amplify their impact and recognize them as key partners in addressing climate challenges.

Social media platforms offer significant potential for young people to communicate their environmental ideas, share resources, and build support. Young activists can leverage compelling digital storytelling techniques to effectively convey the urgency of climate action and inspire others to join their campaigns. By collaborating with online communities, influencers, and climate-focused organizations, they can reach a broader audience. This includes creating and sharing engaging digital materials such as infographics, blogs, and videos to advance the movement against climate change.



Gen Z, Millennials more active than older generations addressing climate change on- and offline

## **Digital Storytelling**

Social media is a rather nebulous term. In essence, however, it is a noun referring to the range of applications that support the co-creation and sharing of content and the creation of social networks. These applications include blogs, forums, podcasts, discussion boards, and social networking sites. This co-creation of content in real-time, along with the ability to embed and share such content, offers storytelling a range of new possibilities. Social media has become ubiquitous, an integral part of daily life.

While the emerging nature of social media promotes episodic narrative sequences, individual units of stories on social media (posts, updates, or tweets) should not be interpreted atomistically, but rather positioned within broader generic, discursive, and behavioral contexts, supported by networked connections between storytellers and their audience. Storytelling can occur through screens but is produced, received, and interpreted in contexts that link both online and offline environments. The media constantly engage in a recursive dynamic of mutual imitation, incorporating aspects of competing media while simultaneously benefiting from the advantages their own forms of mediation offer.

Three recent developments have enhanced the storytelling functionality of digital platforms (such as Twitter, Facebook, etc.):

- 1. The doubling of character limits;
- 2. The ability to create threads;
- 3. The ability to create "moments."

All three of these developments indicate that the drive for storytelling on social media is not simply user-driven experimentation. The enhancement of functionalities often leads to changes in the platforms themselves, changes that embrace new features that make storytelling more accessible.

Greta Thunberg's protests had a modest beginning, but their global impact has been significant. In September 2018, the fifteen-year-old Swedish girl sat in front of the parliament in Stockholm, demanding urgent government action on climate change. After three weeks of protest, marked by the sign reading "Strike," Thunberg launched a movement that became known as "Fridays for Future," attracting millions of young activists worldwide. This movement is not only a symbol of protest but also represents a concrete action by youth to address the climate crisis.

Over the years, young people worldwide have increasingly felt the desire and necessity to take control of the situation: not only by engaging in daily climate actions to benefit the planet, restore the areas where they live, and support local communities but, above all, by raising their voices around the globe. Through digital dissemination, many young people share their experiences daily and inspire thousands more to follow their example, using social media, creating websites, updating blogs, and more.

Let us explore some testimonies that have greatly influenced today's youth in various countries.

#### Tunisia: The Fight Against Plastic

Mohamed Osama Huij, a Tunisian activist, exemplifies how environmental activism is emerging in different contexts. In 2018, during a walk along the Tunisian coastline, Huij noticed the accumulation of plastic. This casual encounter prompted him to launch a waste collection initiative, leading him to cover 300 kilometers in 58 days. Huij, seeking to raise awareness about the severe issue of plastic pollution and its connection to climate change, managed to collect over 100 kg of plastic daily. However, his campaign faced challenges. During a cleanup in Hamem Gazez, he filmed workers unloading waste into a dry lake, highlighting the inertia of local authorities in waste management. Despite these difficulties, Huij remains firmly convinced that plastic pollution represents an urgent challenge, one that can be addressed through collective societal commitment.

## Lebanon: A Movement for Social Change

Joel Zugheb, a 17-year-old, founded the Lebanese chapter of Extinction Rebellion, a global movement demanding immediate actions to halt climate change. His decision to engage in this

battle stemmed from his awareness of Lebanon's dire situation, facing severe shortages of essential resources such as water, clean air, and energy. Initially ridiculed by his peers, Zugheb launched a

protest at his school inspired by Greta Thunberg's "Fridays for Future." With the help of other

youth, he later established the Lebanese branch of Extinction Rebellion, focusing on awareness-

raising actions and clear political demands: reducing greenhouse gas emissions and halting

biodiversity loss. Despite political and social difficulties, Zugheb and his allies are striving to

change the Lebanese society's approach to the climate crisis.

Iran: Commitment to Wildlife

In Iran, environmental activism took a dramatic turn with the case of nine activists arrested in 2018

for attempting to save the Persian cheetah, an endangered species. The activists were accused of

espionage for using cameras to monitor wildlife, but the international community expressed concern

over the lack of due process. Among those arrested, Taher Ghadirian and Niloufar Bayani were

involved in crucial research for the conservation of local animal species, but their cause became a

symbol of the difficulties faced by environmental activists in authoritarian contexts. The death of

one of them, Kavus Seed Emami, in prison raised further questions about the repression of activists

in Iran. The activists' families continue to fight for their release, using social media to pressure

Iranian authorities.

Morocco: A Network of Youth Activists

Hajar Kamrici, a Moroccan engineer and activist, is one of the most significant examples of youth

activism in the Arab world. Founder of the Mediterranean Youth Climate Network, Kamrici has

worked to create a network bringing together young people from the Mediterranean region to

address climate challenges. With a career dedicated to environmental management and industrial

wastewater treatment, Kamrici focused her efforts on strengthening the voice of young Arabs in the

global fight against climate change. While Morocco has adopted important policies, such as the

construction of wind and solar parks, Kamrici and her colleagues believe much more must be done

to address local issues, such as waste management and public transportation system improvements.

Her experience shows that climate change is not only a global issue but also one that requires

concrete local action.

Turkey: The organiser

90

In Artvin, a region in northeastern Turkey, the local community has been engaged for decades in efforts to protect the hills of Cerattepe, an area renowned for its rich biodiversity but also targeted for its deposits of copper, gold, and silver, which attract mining companies. Serkan Dede, who grew up in this climate of activism, fully embraced the cause at the age of 18 by joining the Artvin Green Association to resist drilling activities. Although mining operations have partially persisted, the community's steadfast efforts have mitigated the damage and amplified their voice on a global scale. Today, Dede runs Café Patica, a cultural hub that fosters unity and environmental awareness, while observing with concern the increasingly evident effects of climate change. Through his work, he exemplifies how local resistance can address global environmental challenges.

The stories of activists like Greta Thunberg, Mohamed Osama Huij, Joel Zugheb, the Iranian environmentalists, and Hajar Kamrici demonstrate that the fight against climate change is a battle involving young people from various nationalities, cultural, and political contexts. Each story represents a part of a global movement that continues to grow in strength and influence. However, these activists face unique local challenges, ranging from political and social difficulties to inadequate government responses. Despite these struggles, their actions continue to inspire millions of people worldwide, fostering a collective commitment that can, and must, contribute to combating the global climate crisis.

## 3.5 Impact of Social Media

Social media, as a pervasive force in modern society, has revolutionized communication, interaction, and the dissemination of information. This digital phenomenon has evolved over the past two decades, shaping and reshaping social dynamics, cultural norms, and even political landscapes. From its early stages as simple platforms for online networking to the multi-functional giants of today, social media platforms have fundamentally altered how people connect, share, and communicate on a global scale. However, this digital transformation also brings significant challenges, especially in the realms of misinformation, privacy, and mental health.

Social media's journey began in the early 2000s with platforms like *Six Degrees* (1997), which allowed users to create profiles and connect with others. However, it was the launch of Facebook in 2004, followed by Twitter in 2006, that truly set the stage for the social media revolution. These platforms quickly garnered millions of users, offering tools for individuals to

share personal updates, photos, and opinions, thereby creating virtual communities that transcended geographic boundaries.

As the internet expanded, social media grew in both scope and functionality. Platforms such as Instagram, Snapchat, and TikTok, which emerged in the 2010s, introduced new forms of media sharing, with a strong emphasis on visual content, real-time interaction, and the rise of influencer culture. In parallel, the advent of YouTube in 2005 transformed the way people consumed and created video content, democratizing video production and giving rise to a new era of amateur filmmakers and content creators.

Simultaneously, social media became increasingly integrated into various aspects of daily life. It began as a tool for personal communication, but over time, its role expanded to include business, politics, education, and activism. The development of platforms like LinkedIn, Pinterest, and WhatsApp further diversified its use, catering to both professional networking and private, encrypted messaging.

At its core, social media is a set of online platforms that allow individuals, groups, and organizations to create, share, and interact with contents. Most social media platforms incorporate several key features:

- **Profiles and Personalization:** Users create personal profiles, often featuring information such as biographical details, interests, and photos. This personalization fosters a sense of identity and belonging within the virtual community.
- Content Creation and Sharing: Social media allows users to share content in various forms—text posts, images, videos, and links. The ease with which content can be created and shared has led to an explosion of user-generated content, from selfies to professionalgrade videos.
- Networking and Interactions: Social media platforms enable users to connect with friends, family, colleagues, and even strangers with shared interests. Through features such as "friends," "followers," and "likes," users engage in real-time interactions, expressing support, disagreement, or feedback.
- News and Information Sharing: Platforms like Twitter and Facebook have become
  primary sources of news for millions of people. Users can quickly disseminate and receive
  information, making these platforms critical in moments of crisis, political campaigns, or
  global events.
- Algorithms and Targeted Content: Social media platforms use complex algorithms to personalize content for individual users. By analyzing user behavior—such as interactions,

preferences, and search history—platforms curate a tailored stream of posts, advertisements, and recommendations.

The uses of social media are as varied as its users themselves. In its early years, social media was primarily a means for individuals to keep in touch with friends and family. Over time, however, it has become a multifunctional tool with significant influence across various sectors, such as communication and connectivity; social media has democratized communication. It connects people across geographical, social, and cultural divides, enabling real-time conversations regardless of location. This connectivity has made social media an invaluable tool for maintaining relationships, especially in an increasingly globalized world. Then agaian, Business and Marketing: brands and businesses have harnessed the power of social media for marketing and customer engagement. Platforms like Instagram, Twitter, and Facebook have become essential tools for advertising, brand promotion, and customer feedback.

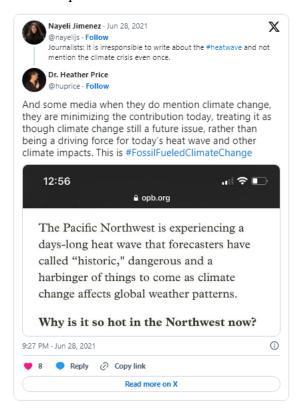
Moreover, social media has become an influential space for political discourse, protest movements, and social change. From the Arab Spring to the #MeToo movement, social media has played a pivotal role in organizing and mobilizing individuals around social justice issues. It has influence also in fields such as Education and Learning, where educators and students alike use social media platforms for collaborative learning, resource sharing, and networking. Platforms like LinkedIn and academic forums provide opportunities for professional development, while YouTube offers educational channels covering a vast array of topics.

Despite its positive aspects, social media is not without its risks, particularly regarding the spread of misinformation and disinformation. The speed at which content is shared and the viral nature of platforms make them fertile ground for rumors, hoaxes, and fabricated news. Misinformation can spread unchecked, especially when it aligns with individuals' preexisting biases or emotional reactions.

Several factors contribute to the spread of false information on social media. Social media algorithms are designed to maximize engagement, often prioritizing sensational or emotionally charged content. This can lead to the widespread circulation of misleading or harmful information. Moreover, users tend to follow like-minded individuals or groups, creating echo chambers where only similar viewpoints are reinforced. This isolation from diverse perspectives makes it difficult for users to critically assess the validity of the information they encounter.

Another fact is the Anonymity, which provided by social media platforms allows users to post without fear of immediate consequences. This can encourage reckless behavior, including the sharing of false or harmful information.

Furthermore, social media platforms have been used by political entities, corporations, and other organizations to manipulate public opinion. The ability to target specific demographics with tailored messages has raised concerns about the use of social media for propaganda, election interference, and other forms of manipulation.



Social media has undeniably transformed the way people interact, communicate, and consume information. Its potential for positive impact—by fostering connections, promoting social causes, and providing a platform for education—should not be overlooked. However, the rise of misinformation, the amplification of false narratives, and the erosion of trust in traditional institutions highlight the need for critical engagement with these platforms. As society becomes ever more intertwined with social media, it is essential to cultivate digital literacy, encourage responsible content sharing, and promote accountability across the digital landscape. Only then can we harness the full potential of social media while mitigating its darker consequences.

#### Collaboration in the Digital Age

Digital platforms have proven to be transformative tools in advancing the Sustainable Development Goals (SDGs), particularly in the context of climate action. Their role in democratizing information and amplifying voices from underrepresented regions, such as small island developing states, has been pivotal in fostering global engagement and raising awareness of pressing issues like climate

change. Digital platforms have revolutionized how stories are told, enabling widespread dissemination of crucial information about climate change, its impacts, and possible solutions. Through social media, blogs, and digital news outlets, geographical barriers are dismantled, allowing for connections between diverse communities and the cultivation of a more informed and engaged public. This accessibility has amplified voices from regions most affected by climate change, ensuring their narratives are heard on a global scale.

Storytelling has emerged as a powerful journalistic tool in communicating the urgency of climate justice. By transforming abstract concepts into relatable human experiences, narratives bridge the gap between data and empathy. Compelling stories of climate impacts not only present facts but also evoke emotional resonance, fostering understanding and inspiring action among policymakers and the broader public.

Digital tools have enhanced this storytelling process, particularly through innovative formats such as short-form video content, interactive web features, and social media campaigns. For instance, short videos on platforms like TikTok have proven highly effective in engaging younger audiences by delivering concise and impactful messages. Similarly, memes have emerged as a surprising yet potent medium for condensing complex ideas into relatable and shareable content, further broadening the reach of climate communication.

The digital space has also facilitated collaboration among journalists and activists, fostering networks that strengthen collective advocacy for climate justice. Virtual workshops and online forums provide platforms for exchanging best practices, addressing challenges, and strategizing impactful reporting. Such initiatives have been particularly instrumental in regions like the Caribbean, where shared experiences of climate vulnerability demand unified voices.

Programs such as the Caribbean Climate Justice Journalism Fellowship exemplify the potential of these networks. By equipping young journalists with the skills to leverage digital tools, such initiatives amplify the capacity to highlight climate justice stories and drive change. The application of these skills is evident in platforms like Instagram, where collaborative efforts showcase innovative approaches to climate reporting.

Digital platforms have also been critical in amplifying diverse perspectives in journalism, challenging traditional narratives and highlighting voices often marginalized in mainstream media. Young women, in particular, have found these platforms invaluable for bringing fresh insights to climate discussions and advocating for sustainable solutions.

The responsibility accompanying this digital empowerment is significant. As custodians of the digital space, users must commit to ethical practices, combating misinformation and promoting reliable, evidence-based narratives. The potential of these platforms to drive social change is immense, but their efficacy depends on their responsible use.

The digital realm represents a new frontier in the fight for a sustainable future. By harnessing its power effectively, it is possible to drive meaningful change, advocate for climate justice, and engage diverse audiences in the pursuit of the SDGs. This opportunity demands both innovation and accountability, ensuring that digital tools are leveraged to their fullest potential for the collective good.

## 3.6 CliVEx

During my university studies, I participated in a virtual international exchange focused on discussing and addressing climate injustice issues, intersecting interculturality and environmental sustainability. This project, called CliVEx, became the inspiration for my thesis. I believe it serves as a perfect example of digital storytelling in the context of sustainability and interculturality. The CliVEx virtual exchange had a significant environmental impact on each student, bringing together cultures from around the world and fostering collaboration among diverse minds to find solutions to the issues discussed.

CliVEx, formally titled "Climate Virtual ExChange: Enhancing Climate Awareness in Europe and the Southern Mediterranean Area," is an initiative dedicated to fostering a vibrant intercultural dialogue. Bringing together students from diverse backgrounds in Europe and the Southern Mediterranean region, the project revolves around the crucial issue of climate change.

The primary goal of CliVEx is to raise climate awareness, transcending geographical and linguistic barriers. The project provides a unique platform for students to engage in discussions, share experiences, and collaborate on climate-related issues. We aim to deepen the understanding of climate change's multifaceted dimensions and to inspire a global perspective on this challenge.

Through this initiative, people in CliVEx empower the next generation of leaders and advocates with the knowledge and insights needed to address pressing environmental concerns. They believe that collaborative learning, enabled by virtual exchange, can drive global climate action. By facilitating connections, sharing expertise, and working together, CliVEx seeks to protect our planet and inspire sustainable solutions.

In this inclusive and collaborative environment, CliVEx nurtures a shared sense of responsibility and purpose in addressing climate change. Our mission is to expand climate awareness and equip students to be champions for environmental sustainability and the preservation of our planet.

The 3-year project involves 16 Higher Education Institutions from 15 different countries located in Europe and in the South Mediterranean area: Algeria, Egypt, France, Germany, Ireland, Italy, Jordan, Lebanon, Morocco, Netherlands, Palestine, Portugal, Spain, Syria, and Tunisia.

The project will involve 1,500 participants in 5 Virtual Exchange "Climate Justice" iterations. In addition, it will train 1,000 young online dialogue facilitators (students and/or young academic staff) to facilitate the dialogues among Virtual Exchange participants. This leads to a community of skilled, certified, and experienced facilitators that can be deployed in other Virtual Exchange initiatives after this project. The specific objectives of CliVEx are:

- To design, develop and implement a Virtual Exchange entitled 'Climate Justice', organised in 5 iterations over 36 months, involving at least 1,500 students from the countries of our full and associated partner HEIs in the Virtual Exchange.
- To have at least 150 climate project ideas developed out of the Virtual Exchanges.
- To train at least 1,000 online dialogue facilitators drawn from the participating Higher Education Institutions, VE alumni, and other young people interested in developing online facilitation skills and coming from the countries of our beneficiaries and associated partners.
- To run a Life Cycle Assessment of the costs of the Virtual Exchange for the environment.

The concept of a "Virtual Climate Exchange" is a novel approach that transcends physical boundaries to facilitate global discussions, collaborative learning, and shared insights on the pressing issue of climate change. It leverages digital technology to bring together individuals from diverse backgrounds, regions, and cultures to engage in a comprehensive dialogue on climate-related topics.

Through this innovative virtual platform, participants can connect, share experiences, and jointly explore the multifaceted aspects of climate change. Virtual climate exchanges enable students, experts, and climate enthusiasts to collaboratively learn about the environmental challenges our world faces and develop actionable solutions.

In a virtual climate exchange, participants can take part in activities such as online discussions, forums, webinars, and digital resources to enhance their understanding of climate issues. This unique concept creates a dynamic, inclusive space where knowledge is shared, ideas are exchanged, and meaningful connections are formed to inspire climate action worldwide.

In essence, the virtual climate exchange concept is a powerful tool for fostering global awareness, uniting people across borders, and working collectively to address climate change

challenges in the modern age. It represents a commitment to environmental education, collaboration, and a shared vision of a sustainable future for our planet.

# Conclusion

This thesis has explored the potential of digital storytelling as a tool to address some of the most pressing challenges of our time: environmental sustainability and interculturality. Through an analysis encompassing both theoretical and applied aspects, it has been possible to identify how this narrative methodology not only facilitates the communication of complex themes but also fosters an inclusive and conscious global dialogue.

Initially, the study examined digital storytelling as a whole, exploring its origins and main characteristics. This foundational analysis was essential to subsequently apply digital storytelling effectively in contemporary dissemination practices. A key contribution of this research lies in highlighting how digital storytelling transforms traditional narratives into immersive multimedia experiences, capable of emotionally engaging audiences and inspiring concrete actions. As discussed in Chapter I, the versatility of this practice makes it a privileged medium for combining visual, auditory, and textual elements, providing immediate and participatory access to stories that raise awareness about issues such as climate change and social inequalities.

The focus then shifted to a globally significant issue: climate justice. This discussion not only addressed the various causes of climate change but also its devastating consequences, disproportionately impacting less privileged populations, particularly in the Global South. The analysis presented in Chapter II emphasized the relationship between climate justice and cultural minorities, highlighting how the most vulnerable communities—often excluded from global decision-making processes—bear the brunt of the crisis due to the negligence of wealthier, more powerful nations. Moreover, it underscored the crucial role of Indigenous populations, who are custodians of much of the world's biodiversity, and stressed the urgent need for behavioral change to protect our planet. The reflection on the postcolonial era and its implications further demonstrated the critical necessity of deconstructing entrenched stereotypes and promoting a more equitable and inclusive worldview.

For individuals and underprivileged communities, digital storytelling provides a platform to reclaim visibility, voice their concerns, and propose alternative solutions. In this context, digital narratives serve not only as tools of denunciation but also as promoters of collective awareness and intercultural solidarity.

In Chapter III, the role of digital storytelling as a bridge between sustainability and interculturality was explored. It emerged that this methodology is not merely an information vehicle

but also a collaborative space where diverse voices can meet, shaping polyphonic narratives. Digital storytelling also provides a platform to celebrate diversity through content created by the protagonists themselves. By amplifying the voices of marginalized groups, it highlights the uniqueness of each culture and builds an inclusive collective narrative.

One of the most significant findings of this study is the need for greater democratization of digital tools. While digital storytelling offers extraordinary possibilities, its impact remains constrained by the lack of access to technology in many regions of the world. Overcoming these barriers requires collective efforts to ensure that marginalized communities can fully participate in this narrative form and leverage its potential to raise awareness and inspire action.

Moreover, integrating digital storytelling into fields such as education, politics, and corporate culture could transform how we approach global challenges in an increasingly interconnected world. The ability to use digital stories as tools for learning, advocacy, and intercultural dialogue opens new avenues for creating awareness and fostering social change.

Despite the numerous opportunities offered by digital storytelling, it is not without challenges. As discussed within the context of society, there is a risk that these narratives may be exploited for commercial or manipulative purposes, thereby losing their authenticity and ethical value. Thus, a critical and responsible approach to the use of narrative technologies is imperative.

At the same time, digital storytelling stands out for its ability to continually reinvent itself, thanks to its dynamic and interdisciplinary nature. This adaptability makes it a particularly suitable tool for addressing the complex and interconnected problems of contemporary times, from the climate crisis to the need for more inclusive societies.

In summary, this thesis has demonstrated that digital storytelling is not merely a narrative medium but a powerful tool for social transformation. Through the integration of digital and narrative content, it connects people, cultures, and perspectives, fostering a deeper and more nuanced understanding of global issues. It is a transformative instrument that unites the power of storytelling with the potential of technology. Between environmental sustainability and interculturality, it provides a lens through which to view the world with greater awareness and a medium to act with greater efficacy.

Digital stories on these themes not only educate but also inspire us to build a more sustainable and inclusive future, where cultural diversity and respect for the environment mutually reinforce each other. The hope is that this research will contribute to stimulating further reflections and experiments in the fields of digital storytelling, sustainability, and interculturality, enabling them to continue evolving as drivers of change. Only through conscious and inclusive use of these

technologies will it be possible to realize their full potential, creating a future where stories are not only told but also lived and shared for a better world.

"They are the memories of the community, not history, not an archive, not a list of authorities, but a living memory, the consciousness of collective identity intertwined in hundreds of stories" (Lambert, INDIRE, 2007).

# Riassunto in Italiano

#### Introduzione

La tesi analizza l'interconnessione tra sostenibilità e interculturalità, focalizzandosi sul ruolo della narrazione digitale (*Digital Storytelling*) per sensibilizzare e ispirare azioni collettive verso un futuro più sostenibile.

Nel corso dei secoli, la narrazione ha rappresentato uno degli strumenti più potenti per trasmettere conoscenze, valori ed esperienze. Dalle storie raccontate intorno al fuoco ai moderni mezzi digitali, la capacità di comunicare attraverso il racconto ha costantemente evoluto il modo in cui gli esseri umani si relazionano al mondo e tra di loro. L'avvento delle tecnologie digitali ha segnato una svolta epocale, trasformando la narrazione tradizionale in un processo interattivo e multimediale che supera le barriere geografiche e culturali. Questo fenomeno, noto come narrazione digitale o digital storytelling, non solo arricchisce il panorama comunicativo contemporaneo, ma offre strumenti innovativi per affrontare le sfide globali più urgenti, come il cambiamento climatico e le disuguaglianze sociali.

La narrazione digitale integra strumenti multimediali come immagini, suoni e video per creare e condividere storie coinvolgenti che superano barriere culturali e promuovono consapevolezza ambientale.

Il digital storytelling nasce negli anni '90 come evoluzione delle tecniche narrative tradizionali, adattandosi al nuovo contesto tecnologico. Grazie alla combinazione di testo, immagini, suoni e video, si configura come un mezzo comunicativo versatile, capace di coinvolgere emotivamente il pubblico e di stimolare la riflessione critica. Più di una semplice modalità espressiva, la narrazione digitale si presenta come una piattaforma partecipativa che dà voce a comunità marginalizzate e promuove un dialogo globale inclusivo. In un mondo sempre più interconnesso, essa si rivela uno strumento fondamentale per sensibilizzare su questioni complesse, favorendo la comprensione reciproca e stimolando azioni collettive.

Un elemento distintivo del digital storytelling è la sua capacità di trasformare le esperienze personali in narrazioni universali, amplificando il potenziale comunicativo delle storie. Attraverso la personalizzazione e il coinvolgimento emotivo, questo approccio non solo informa, ma ispira. L'uso strategico del contenuto emotivo, unito a un linguaggio visivo e sonoro accattivante, crea un impatto duraturo, rendendo la narrazione digitale uno strumento efficace per il cambiamento

sociale. Essa consente di superare i limiti delle narrazioni tradizionali, offrendo un'esperienza immersiva e interattiva che stimola la partecipazione del pubblico. Questo non è un dettaglio marginale: in un'epoca in cui le informazioni sono spesso frammentate e dispersive, la capacità di catturare l'attenzione e creare connessioni significative è un vantaggio cruciale. Allo stesso tempo, il digital storytelling si inserisce in un contesto di profonde trasformazioni culturali e tecnologiche.

Tra le sue numerose applicazioni, il digital storytelling ha trovato un terreno fertile nell'ambito educativo, dove viene utilizzato per sviluppare competenze creative e promuovere l'apprendimento interdisciplinare. Attraverso giochi interattivi, applicazioni educative e progetti collaborativi, si stimola nei giovani la consapevolezza su temi globali come il cambiamento climatico e la giustizia sociale. La narrazione digitale non è solo uno strumento didattico, ma un mezzo per coltivare empatia e responsabilità, elementi essenziali per formare cittadini consapevoli e attivi.

Il potenziale del digital storytelling si estende anche al campo della sostenibilità, dove viene utilizzato per sensibilizzare il pubblico su temi ambientali e per promuovere soluzioni innovative. Ad esempio, attraverso iniziative virtuali, studenti di diversi paesi possono collaborare a distanza per affrontare questioni climatiche, superando barriere linguistiche e culturali. Questi progetti dimostrano come il digitale possa creare reti globali di apprendimento e azione, fornendo strumenti per affrontare problemi complessi con approcci inclusivi e collaborativi.

Tuttavia, la diffusione del digital storytelling non è priva di sfide. L'accesso ineguale alla tecnologia in molte parti del mondo limita le possibilità di partecipazione di alcune comunità, esacerbando le disuguaglianze già esistenti. Inoltre, il rischio di sfruttamento commerciale e manipolazione delle narrazioni pone questioni etiche fondamentali. Perché il digital storytelling possa realizzare appieno il suo potenziale trasformativo, è necessario un approccio critico e responsabile, che garantisca un uso equo e inclusivo delle tecnologie narrative.

Il digital storytelling rappresenta un ponte tra passato e futuro, unendo l'antica arte della narrazione con le opportunità offerte dal digitale. È uno strumento potente per costruire connessioni, amplificare voci marginalizzate e promuovere cambiamenti significativi. Nel contesto attuale, in cui le sfide globali richiedono soluzioni innovative e collaborative, il digital storytelling emerge come una risorsa essenziale per favorire un dialogo interculturale e una maggiore consapevolezza ambientale. Esso non solo racconta storie, ma crea comunità, ispira azioni e apre nuove prospettive per un futuro più equo e sostenibile.

In un mondo sempre più interconnesso e, allo stesso tempo sempre più malato a causa dei bisogni e desideri dell'uomo, si è voluto concentrare l'attenzione proprio su quegli strumenti quotidiani che possono aiutare le persone a farsi sentire ed essere ascoltate.

### Capitolo 1: La Narrazione Digitale

Lo storytelling è una pratica antica e universale che permette di dare senso agli eventi della realtà attraverso la narrazione. È una forma di comunicazione che unisce emozione, riflessione e organizzazione logica, capace di coinvolgere il pubblico e lasciare un impatto duraturo. Negli ultimi decenni, questa pratica si è evoluta grazie alla tecnologia, dando origine al digital storytelling, che combina gli strumenti narrativi tradizionali con mezzi digitali come immagini, video, audio e grafica per creare esperienze narrative multimediali. Questo approccio non solo permette di raccontare storie più accessibili e visivamente accattivanti, ma amplifica il loro impatto grazie alla possibilità di raggiungere un pubblico globale.

La narrazione digitale, nata negli anni '90 in California, combina tecniche tradizionali con strumenti digitali, rendendola versatile e accessibile in contesti educativi, sociali e culturali. Si afferma come strumento potente nelle scienze umane e sociali, con applicazioni che spaziano dall'educazione all'attivismo sociale. La sua caratteristica distintiva è la capacità di combinare prospettive soggettive con mezzi tecnologici, dando voce a storie personali e comunitarie. Questo metodo è stato utilizzato per promuovere l'alfabetizzazione digitale, favorire lo scambio intergenerazionale nelle comunità indigene e supportare i gruppi sociali emarginati. Inoltre, il digital storytelling si distingue per la sua capacità di integrare e armonizzare elementi come testi, immagini e suoni per creare storie che risuonano emotivamente con il pubblico.

I suoi elementi fondamentali includono il <u>punto di vista personale</u>, la <u>domanda drammatica</u> e il <u>contenuto emotivo</u>.

Il punto di vista personale unisce l'autenticità alla narrazione; nell'era del digitale ogni individuo è libero di esprimersi e di dare spazio alla propria creatività attraverso una varietà di strumenti online e piattaforme. La domanda drammatica, invece, stimola curiosità e riflessione. In una realtà dinamica come quella attuale, è molto facile perdere la curiosità nelle cose e fermarsi a riflettere su queste, proprio a causa di come il digitale oggi giorno ci renda semplice avere tutte le informazioni che cerchiamo a portata di un click. Quindi è molto importante saper distinguere come usare in maniera positiva gli strumenti digitali, e capire come questi possano invece aumentare la curiosità di ciascun individuo. Infine, il contenuto emotivo coinvolge emotivamente l'audience. Le emozioni giocano un grande ruolo nelle decisioni prese da ciascun individuo, e possono smuovere diverse comunità nel mondo che affrontano a distanza un problema comune, come quello climatico. E' importante quindi, non solo dare voce al contenuto emotivo degli utenti, ma anche riuscire ad ascoltare ciò che provano le persone per cercare soluzioni sempre più intercollegate.

L'uso di piattaforme digitali, come i social media, amplia la portata di queste storie, creando una connessione globale. Attraverso approcci partecipativi, la narrazione digitale consente a comunità emarginate di raccontare le proprie esperienze, promuovendo giustizia sociale e ambientale.

Il digital storytelling ha trovato un terreno fertile anche nell'educazione, dove viene utilizzato per sviluppare competenze creative e favorire l'apprendimento interdisciplinare. Attraverso l'uso di strumenti come giochi interattivi e applicazioni educative, è possibile insegnare ai giovani concetti chiave legati alla sostenibilità e stimolare riflessioni critiche sulle loro azioni quotidiane. Inoltre, progetti come il *Climate Virtual Exchange* dimostrano come il digital storytelling possa connettere persone di diverse culture e paesi, promuovendo soluzioni innovative a problemi globali.

La convergenza culturale, descritta da Henry Jenkins, rappresenta l'integrazione di media tradizionali e digitali in esperienze narrative multidimensionali. Questo fenomeno trasforma lo spettatore e lo rende un partecipante attivo. Esso fa sì che vengano utilizzate diverse piattaforme come, film, videogiochi, social media, e altro ancora per ampliare la narrazione e coinvolgere più voci possibile. Così facendo, si creano sinergie narrative, permettendo a ogni medium di contribuire in modo unico. Un altro aspetto centrale della cultura della convergenza descrive il fenomeno per cui storie e media si intrecciano su diverse piattaforme, creando esperienze narrative transmediali. Questo approccio non solo arricchisce la narrazione e permette al pubblico di diventare co-creatore delle storie. La convergenza dei media rappresenta una trasformazione culturale che ridefinisce il rapporto tra produttori, consumatori e contenuti, aprendo nuove possibilità per il digital storytelling.

Nella tesi si esplora anche il legame tra letteratura elettronica e narrazione digitale, sottolineando come entrambe sfruttino il potenziale del digitale per ridefinire la narrazione tradizionale. La letteratura elettronica, che integra testo, immagini e interazioni, sfida le nozioni tradizionali di autore e lettore, trasformando la narrazione in un processo collaborativo. Questa interdisciplinarità riflette la capacità del digital storytelling di connettere campi diversi, creando nuovi modi di raccontare e comprendere le storie.

Infine, grazie alla narrazione transmediale si espandono i confini del racconto, il pubblico viene invitato ad esplorare la storia attraverso molteplici punti di vista e viene coinvolto in progetti interattivi.

Il digital storytelling è un mezzo potente per affrontare le sfide del nostro tempo, combinando creatività e tecnologia per comunicare messaggi complessi in modo accessibile e coinvolgente. La sua capacità di unire persone e culture diverse, promuovere la sostenibilità e ispirare cambiamenti sociali lo rende uno strumento essenziale per il mondo contemporaneo.

### Capitolo 2: Le Sfide del Cambiamento Climatico

Il cambiamento climatico rappresenta una delle principali crisi del nostro tempo. Questo è diventato un problema quotidiano delle vite di tutti, ed è causato dall'aumento di gas serra dovuto all'uso di combustibili fossili.

A partire dalla Rivoluzione Industriale, la concentrazione di gas serra, come il biossido di carbonio, è aumentata significativamente, intrappolando calore nell'atmosfera e causando un riscaldamento globale. Il riscaldamento del pianeta ha provocato effetti devastanti: eventi meteorologici estremi come ondate di calore e alluvioni, scioglimento dei ghiacciai e innalzamento del livello del mare, perdita di biodiversità e riscaldamento degli oceani. La temperatura globale ha superato la soglia critica di 1,5°C, con implicazioni gravi per gli ecosistemi e per milioni di persone. Gli impatti aumentano in modo esponenziale con l'incremento delle temperature, esponendo ulteriori popolazioni a rischi climatici e sociali.

La tesi introduce il concetto di giustizia climatica, sottolineando la necessità di includere le comunità indigene e marginalizzate nei processi di adattamento e mitigazione, evidenziando il ruolo della narrazione digitale nel dar loro voce.

Inatti, la maggior parte delle conseguenze degli eventi meteorologici estremi vengono subite dalle popolazioni che hanno meno a che fare con il problema di per sé. Ciò causa uno squilibrio negli ecosistemi e la perdita della biodiversità, che è protetta e curata generalmente dalle comunità indigene ancora esistenti nei diversi territori del pianeta. Ad esempio, gli Inuit nell'Artico affrontano lo scioglimento dei ghiacci che compromette la loro mobilità, la caccia e la sicurezza alimentare, minacciando la loro identità culturale. Altre comunità indigene, come i Rapa Nui dell'Isola di Pasqua o i Maori in Nuova Zelanda, sono custodi di biodiversità critiche e di conoscenze tradizionali essenziali per la conservazione ambientale.

Il secondo capitolo analizza anche il concetto di "colonialismo verde", un fenomeno in cui iniziative ambientali globali finiscono per espropriare le popolazioni indigene delle loro terre. Ad esempio, in Brasile e in Norvegia, progetti di conservazione e di energia rinnovabile hanno spesso trascurato i diritti delle comunità locali, causando sfollamenti forzati e distruzione di mezzi di sussistenza. Il colonialismo verde rappresenta un'estensione delle disuguaglianze storiche legate al colonialismo tradizionale, perpetuando l'oppressione economica e sociale.

Una delle sezioni più significative riguarda la connessione tra cambiamento climatico e disuguaglianze razziali e di genere. Le popolazioni marginalizzate, come i Rom in Romania o le comunità nere negli Stati Uniti, affrontano livelli più elevati di inquinamento, condizioni abitative

peggiori e accesso limitato alle risorse. Questo "razzismo ambientale" evidenzia come il cambiamento climatico non sia solo una questione ambientale, ma anche un problema di giustizia sociale.

Inoltre la tesi esamina le implicazioni dell'estrazione mineraria per le tecnologie energetiche pulite. Sebbene queste tecnologie siano essenziali per la decarbonizzazione, l'estrazione di minerali critici come il litio e il cobalto ha un impatto devastante sulle comunità locali e sugli ecosistemi. La gestione sostenibile delle risorse naturali è cruciale per evitare che le soluzioni al cambiamento climatico contribuiscano a nuovi problemi ambientali e sociali.

Infine, viene discussa la connessione che c'è tra cambiamento climatico e conflitti: due decenni di analisi e dibattiti internazionali sul rapporto tra cambiamento climatico e sicurezza si sono concentrati su come la rapida destabilizzazione climatica possa minare la sicurezza nazionale. Ma ha ampiamente ignorato il modo in cui le decisioni relative alla sicurezza nazionale, come la spesa militare e lo svolgimento della guerra, possono influenzare il clima e, a loro volta, minare la sicurezza collettiva. Poiché la distruzione del clima continua e accelera, è importante comprendere e ridurre al minimo le emissioni derivanti da tutte le attività sociali, sia in tempo di pace che in tempo di guerra. Tuttavia, quando si tratta di emissioni militari e conflitti, questo rimane un obiettivo lontano.

Il capitolo sottolinea l'urgenza di affrontare il cambiamento climatico attraverso un approccio integrato che tenga conto non solo delle implicazioni ambientali, ma anche di quelle sociali e culturali. Promuovere la giustizia climatica, riconoscere il ruolo delle comunità indigene e garantire un accesso equo alle risorse sono passi fondamentali per costruire un futuro sostenibile e inclusivo.

## Capitolo 3: Narrazione Digitale per Sostenibilità e Interculturalità

Nel terzo e ultimo capitolo, viene affrontato il tema dell'intersezione tra interculturalità ed ecosostenibilità, evidenziando come il digitale e in particolare il digital storytelling possano fungere da ponte per un dialogo globale su questioni ambientali e culturali. Il digital storytelling si configura come uno strumento potente per narrare storie che superano le barriere geografiche e culturali, promuovendo consapevolezza e azione collettiva su problemi complessi come il cambiamento climatico e le ingiustizie sociali.

Inizialmente, si esplora come il digital storytelling offra una piattaforma per le comunità marginalizzate, in particolare nei paesi del Sud globale, per condividere le loro esperienze e sfidare rappresentazioni stereotipate. Attraverso strumenti digitali come video, podcast e blog, queste

narrazioni diventano accessibili a un pubblico globale, contribuendo a ridurre le disuguaglianze informative. Questo approccio consente di mettere in luce le connessioni storiche tra colonialismo e crisi ambientali, stimolando un dialogo critico e promuovendo soluzioni inclusive e sostenibili. Tuttavia, nei Paesi più poveri e quindi più colpiti del pianeta, gli strumenti digitali non arrivano così facilmente e non sono scontati come invece possono esserlo in altri Stati più privilegiati, come per esempio Europa, Stati Uniti, Australia, Asia. Spesso questo fattore non è tenuto in considerazione, e certe zone del pianeta rimangono svantaggiate.

Il digital storytelling ha inoltre un ruolo chiave nell'educazione interculturale. Integrando storie di resilienza e innovazione ecologica nei curricula scolastici, si ispira la responsabilità verso la giustizia climatica nelle nuove generazioni. Progetti collaborativi tra studenti di diversi paesi dimostrano come la narrazione digitale possa facilitare lo scambio di idee e pratiche locali, rafforzando un approccio condiviso alle soluzioni ambientali.

Un esempio concreto presentato nel testo è il progetto *CliVEx* (*Climate Virtual Exchange*), che coinvolge studenti da diverse regioni europee e del Mediterraneo meridionale in un dialogo virtuale sul cambiamento climatico. Questo progetto mira a superare le barriere linguistiche e culturali, promuovendo una comprensione globale delle questioni climatiche e incoraggiando lo sviluppo di soluzioni collaborative. *CliVEx* dimostra come il digitale possa creare reti di apprendimento e azione globale, fornendo agli studenti gli strumenti per diventare leader nella lotta contro le crisi ambientali.

Si è proseguito poi analizzando l'impatto delle piattaforme digitali, come *Global Voices* e *We Are Water Foundation*, che amplificano le voci delle comunità colpite da crisi climatiche e promuovono campagne di sensibilizzazione. Queste organizzazioni utilizzano il digitale per condividere storie e pratiche sostenibili, dimostrando come la tecnologia possa essere utilizzata non solo per informare ma anche per ispirare cambiamenti tangibili. Inoltre, grazie a queste organizzazioni, ciascun individuo e/o comunità, può attivamente partecipare ad attività di supporto per il pianeta e per le popolazioni più colpite dal cambiamento e dall'ingiustizia climatica.

Le strategie di comunicazione sul cambiamento climatico prese in esame nel terzo capitolo, evidenziano l'importanza di un linguaggio positivo e orientato alle soluzioni. Mentre la comunicazione tradizionale spesso si concentra sulla gravità della crisi, un approccio basato su storie di successo e azioni concrete può motivare le persone ad agire. E' importante allineare le strategie di comunicazione con il contenuto che si vuole trasmettere, e cercare di farsi sentire il più possibile coinvolgendo e condividendo quante più esperienze possibili.

Un altro aspetto centrale è la lotta contro la disinformazione climatica. E' necessario captare le tecniche di manipolazione utilizzate per negare il cambiamento climatico o ritardare l'adozione di soluzioni e contrastarle quanto più possibile. Strumenti educativi come il modello FLICC e campagne di fact-checking vengono presentati come risposte essenziali per contrastare la diffusione di informazioni false. Ad esempio, la trasparenza e la regolamentazione delle pratiche di greenwashing, ovvero la rappresentazione ingannevole di impegni ambientali da parte delle aziende, sono ritenute fondamentali per costruire una transizione sostenibile autentica.

Così come è necessario essere consapevoli della propria Carbon Footprint, in modo che, divulgando sempre di più l'importanza di questa, ogni persona e comunità cambiando le proprie azioni quotidiane nel loro piccolo, tutti insieme possano portare a grandi cambiamenti.

Viene inoltre sottolineato il ruolo dei giovani nell'era digitale, che grazie ai social media possono condividere esperienze, sensibilizzare il pubblico e creare movimenti globali per il cambiamento. Essi infatti, sono i promotori di strumenti digitale e coloro che sono più preoccupati per il futuro del nostro pianeta. Ecco perché sono sempre più frequenti da parte di giovani attivisti movimenti per includere esperienze diverse ed accattivanti. E lo fanno attraverso il metodo che meglio conoscono: il digitale.

Tra le tecniche principali di divulgazione digitale troviamo l'organizzazione di campagne sui social media per diffondere messaggi di sensibilizzazione attraverso immagini e video; e ancora la creazione di documentari digitali per raccontare storie reali di comunità colpite da disastri ambientali; ed infine i progetti educativi interattivi, come giochi che insegnano la sostenibilità alle nuove generazioni.

Attraverso questi strumenti, la narrazione digitale crea empatia, stimola l'azione e rafforza l'identità culturale, favorendo una visione condivisa del futuro.

Viene inoltre citato il concetto di Scambio climatico virtuale" come esempio di collaborazione globale per affrontare le sfide ambientali. Attraverso attività online come webinar, forum e risorse interattive, queste iniziative creano spazi dinamici per apprendere, condividere esperienze e sviluppare soluzioni innovative.

Il terzo e ultimo capitolo sottolinea come il digitale, se utilizzato eticamente, possa essere una forza trasformativa per promuovere la sostenibilità e il dialogo interculturale. Attraverso il digital storytelling, è possibile creare un futuro più equo e sostenibile, in cui le voci di tutte le comunità siano ascoltate e valorizzate.

#### Conclusione

Questa tesi ha esplorato il potenziale del digital storytelling come strumento per affrontare due delle sfide più pressanti del nostro tempo: la sostenibilità ambientale e l'interculturalità. Attraverso

un'analisi sia teorica sia applicata, è stato possibile evidenziare come questa metodologia narrativa non solo semplifichi la comunicazione di temi complessi, ma favorisca anche un dialogo globale inclusivo e consapevole.

Lo studio ha inizialmente approfondito le origini e le caratteristiche principali del digital storytelling, dimostrando come esso trasformi le narrazioni tradizionali in esperienze multimediali immersive, capaci di coinvolgere emotivamente il pubblico e ispirare azioni concrete. Questa pratica, analizzata nel Capitolo I, integra elementi visivi, sonori e testuali, offrendo un accesso immediato e partecipativo a storie che sensibilizzano su questioni cruciali come il cambiamento climatico e le disuguaglianze sociali.

Successivamente, l'attenzione si è concentrata sulla giustizia climatica, analizzandone le cause e le conseguenze, con un'enfasi particolare sulle popolazioni più vulnerabili del Sud globale.

Il Capitolo II ha messo in luce come queste comunità, spesso escluse dai processi decisionali globali, subiscano le maggiori conseguenze della crisi climatica. Inoltre, ha evidenziato il ruolo essenziale delle popolazioni indigene, custodi di gran parte della biodiversità mondiale, e la necessità di un cambiamento comportamentale per proteggere il pianeta. La riflessione sul post-colonialismo ha dimostrato l'urgenza di decostruire stereotipi radicati e promuovere una visione del mondo più equa e inclusiva. Il digital storytelling, in questo contesto, offre una piattaforma per dare visibilità alle comunità emarginate, consentendo loro di esprimere preoccupazioni e proporre soluzioni alternative.

Nel Capitolo III, il digital storytelling è stato analizzato come un ponte tra sostenibilità e interculturalità, emergendo non solo come mezzo di informazione ma anche come spazio collaborativo dove diverse voci possono incontrarsi. Questa metodologia celebra la diversità attraverso contenuti creati direttamente dai protagonisti, valorizzando l'unicità di ciascuna cultura e costruendo una narrazione collettiva inclusiva. Tuttavia, la ricerca ha evidenziato la necessità di democratizzare ulteriormente l'accesso agli strumenti digitali, poiché molte regioni del mondo non dispongono ancora delle risorse necessarie per partecipare pienamente a questo tipo di narrazione.

L'integrazione del digital storytelling in ambiti come l'educazione, la politica e la cultura aziendale potrebbe trasformare il modo in cui affrontiamo le sfide globali. Usare queste storie come strumenti di apprendimento e dialogo interculturale apre nuove possibilità per sensibilizzare e promuovere il cambiamento sociale. Nonostante le opportunità offerte, il digital storytelling presenta anche sfide: rischia di essere sfruttato a fini commerciali o manipolatori, perdendo così la propria autenticità e valore etico. È quindi fondamentale adottare un approccio critico e responsabile nell'uso delle tecnologie narrative.

Un elemento chiave del digital storytelling è la sua capacità di reinventarsi continuamente, grazie alla sua natura dinamica e interdisciplinare. Questa flessibilità lo rende particolarmente adatto ad affrontare problemi complessi e interconnessi, come la crisi climatica e la necessità di società più inclusive. La tesi ha dimostrato che il digital storytelling non è solo un mezzo narrativo, ma un potente strumento di trasformazione sociale, capace di collegare persone, culture e prospettive, promuovendo una comprensione più profonda delle questioni globali.

In conclusione, le storie digitali su temi come la sostenibilità ambientale e l'interculturalità non si limitano a educare, ma ispirano a costruire un futuro più inclusivo e sostenibile. Questo futuro sarà caratterizzato da una maggiore consapevolezza culturale e da un rispetto reciproco tra la diversità culturale e l'ambiente. La speranza è che questa ricerca possa stimolare ulteriori riflessioni ed esperimenti nel campo del digital storytelling, contribuendo a far evolvere queste pratiche come veri motori di cambiamento. Solo attraverso un uso consapevole e inclusivo delle tecnologie narrative sarà possibile realizzarne il pieno potenziale, creando un mondo dove le storie non solo si raccontano, ma si vivono e si condividono per un futuro migliore.

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