

Charting pathways to planetary health:  
ecology, education, and economics

# Conference Abstracts



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Oral Presentation

# Towards the Great Transition: Changing science education for the future

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## ABSTRACT

The São Paulo Declaration on Planetary Health, issued in October 2021, calls for “a fundamental shift in how we live on Earth” resulting in “the Great Transition”. Achieving this outcome will require “rapid and deep structural changes across most dimensions of human activity” including education. It will require, too, “rethinking our values and relationship within Nature and to each other from human exceptionalism, domination, and scarcity to interdependence, equity, and regeneration”. So, how should science education respond to this challenge and how can we support “the Great Transition”. The Declaration suggests that schools “Teach planetary health education from an early age” and “Utilize transdisciplinary and participatory approaches to design teachers’ education and training materials”. It also calls for schools to “Incorporate Nature-based and experiential learning outside of the classroom”. Implicit in the declaration is an acceptance that recent events have called into question the adequacy of the science education offered in schools. The evidence suggests that, despite studying science at primary and secondary school, significant numbers of the public seem unfamiliar with some basic but important facts related to health, the environment and sustainability. A related issue is that trust in science and scientists is not as strong as might be expected in a developed country. Rather than carry on as though there is not really a problem, I will argue that we need to rethink what and how we teach science in schools. We also need to value what museums, science centres, botanic gardens, etc., can do to help. Finally, we need to examine what science, ecological and environmental education offer in terms of addressing the wicked problems facing society.

*Keywords:* Environmental education, sustainability education, science|environment|health

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## Oral Presentation

# SAREP

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## ABSTRACT

SAREP is a value adding large scale nature tech climate protection project, focusing on natural carbon sequestration. Objective is the establishment of a large scale carbon sink system in the Mauretanian desert by using desalinated sea water. Desalination will be based on solar, wind and biofuels. SAREP will use the desalinated sea water for the irrigation of trees, bushes and agricultural products to store carbon, produce biomass products (timber, pellets, biochar, biofuel) and create food and water security. We assume storage potential of up to 160 t CO<sub>2</sub>/ha/year or a dry matter production of at least 60t biomass /ha/year. SAREP will create up to 2000 jobs per 10.000 ha and provide free housing, education, food and a fair salary. In addition to free housing each family working for SAREP will have 200 sqm land and free water for food subsistence.

SAREP is designed as a **Green Business** project aiming at 6- to 12 % return on equity investment. Carbon certificate prices are assumed to reach 160 € per ton in 2040 and the LCOW will be below 0,40€/cbm.

SAREP will mitigate migration by offering food security, well paid jobs and shelter for migrants and locals.

The brine resulting from the desalination process will be used to extract salt, potassium and magnesium.

The rather high capex will be paid back by selling biomass commodities, water, minerals and carbon certificates.

*Keywords:* Climate protection, migration mitigation and regional sustainable development

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Oral Presentation

# Urban Climate Action Games

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## ABSTRACT

In response to the unsuccessful climate policy of nation states, some actors are proposing a strong role of municipalities for climate action. More and more cities are submitting climate plans. But if 193 nation states cannot agree on effective climate protection, then why should hundreds of thousands of cities worldwide? Instead, a suitable interplay between states and cities is needed. In this real-world game, transnational city networks can play a key role. The talk presents an overview of pitfalls and opportunities of urban climate action. In addition, it reports on an educational multiplayer online game (Keep Cool Mobile) that illustrates this tension between global and urban climate action.

*Keywords:* Climate change, cities, games

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Oral Presentation

# Legal and Policy Dimension for Effective Soil Health Management

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## ABSTRACT

Soil health is the cornerstone of ecological sustainability, agricultural productivity, food security and environmental resilience. It is the second-largest natural carbon sink on Earth, after the oceans. Hence, both from its anthropocentric utility and ecocentric perspectives, conservation of soil health becomes paramount. However, despite its critical significance, the legal and policy framework for soil health, in several jurisdictions across the world, including India, remains largely fragmented, underdeveloped and is often inadequate to keep pace with the escalating challenges posed by rapid urbanization, population growth, industrialization, commercial agricultural practices, and climate change.

In this session, the speakers will present an evaluatory study on the existing legal and policy frameworks having dimensions of soil health to identify the inadequacies in the current state of the law including regulatory and implementations challenges. The evaluation is also undertaken from a comparative lens emphasizing the intersection of international commitments, environmental law, agricultural and industrial policy, and land-use management. The key issues focused in the session include land acquisition and land use planning; waste management, impact of pesticides, and high-yield crop variety seeds on soil health; soil and water contamination in wetlands and impact of commercial aquaculture; impact of alien species on soil, biodiversity and environment; and access to justice mechanisms for resolution and adjudication of legal disputes related to soil health. The central argument of the speakers revolves around three key ideas. *Firstly*, the first step for an effective soil management law and policy framework would be to have a holistic understanding of the sources of soil contamination. Presently, there is lack of comprehensive understanding of the various dimensions of soil health, including lack of data. *Secondly*, there is inadequate appreciation of soil as a natural resource independent of land. While land can be owned, soil as a resource should be governed by Public Trust Doctrine to prevent its over-exploitation through tragedy of the commons and to ensure its sustainable management. *Thirdly*, by underscoring the need for enactment of a separate soil law under the Environment Protection legislations, the speakers aims to offer actionable recommendations that can further the vision of protecting “wholesome health” of soil.

*Keywords:* Soil Health Management, Climate Change, Soil resilience, Public Trust Doctrine

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Oral Presentation

# University Campuses as Living-Learning Laboratories

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## ABSTRACT

University campuses are uniquely positioned to serve as living-learning laboratories, integrating experiential education, sustainability, and innovation to address pressing global challenges. This presentation explores how university campuses can become dynamic platforms for advancing planetary health by linking ecology, education, and economics. Grounded in published research, this approach leverages experiential learning, building-based education, and strategic student projects to deliver impactful outcomes.

The living-learning laboratory model emphasizes cross-disciplinary collaboration, wherein students, faculty, and staff engage in real-world problem-solving. Initiatives include energy audits, indoor air quality monitoring, and water system analysis, where students apply classroom theories to the campus environment. Partnerships with external companies further enhance learning outcomes, fostering opportunities for internships, data-sharing, and scalable innovations in decarbonization and circular resource management.

Attendees will gain insights into how integrating sustainability-focused curricula with campus operations can align with the United Nations Sustainable Development Goals (SDGs) while preparing students for leadership in a changing global landscape. By exploring examples of student-led projects and outcomes, participants will understand the value of creating replicable frameworks for connecting campuses with local and global sustainability objectives.

This presentation aligns with the conference theme, "Charting Pathways to Planetary Health," by demonstrating how universities can become hubs of ecological restoration, economic innovation, and education for sustainability. Attendees will leave with actionable strategies to harness their campuses as engines of transformative change for planetary health.

*Keywords:* Living-learning laboratory, Experiential Learning, Sustainability Leadership

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Oral Presentation

# Climate Imaginaries on Social Media

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## ABSTRACT

*Climate imaginaries* condition what climate futures are publicly considered possible, likely or (un-) desirable. Following Mike Hulme in his book *Climate Change* (2022), these imaginaries can be understood, for instance, as collectively shared sets of beliefs or narratives – ways in which society makes sense of their environment, including the norms and climate knowledge of a given time. Acknowledging this, it becomes evident that climate imaginaries contribute considerably to framing the societal pathways to planetary health. Specifically, they shape practices, experiences, and identities of social groups and thus can be traced in public (digital) discourse. Analyzing the latter is one of the key objectives of digital sociolinguistics. This contribution draws on discourse- and sociolinguistic research that identifies typical multimodal practices in social media environments, determines functional categories, and investigates how digital discourse reflects and shapes group identities related to climate change topics. This includes the users' visual and textual expressions of their beliefs, their posts' purposes and functions as well as the relation to group identities. Selected examples will provide insights into the role of language and visuals in co-producing climate imaginaries in digitally shared environments.

*Keywords:* Climate Imaginaries, Social Media Discourse, Multimodal Sense-making

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# Student Presentations

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## Student Presentation

# “Flexible sustainability” McDonald’s organizational communication

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## ABSTRACT

In 2019, McDonald’s introduced its first vegan burger. It was widely advertised and mentioned in McDonald’s sustainability reports of the following years. Since 2022, the same year in which fast food restaurants faced wide criticism for the contamination of vegan patties with meat by frying them in the same pot, the word ‘vegan’ or even ‘vegetarian’ was nowhere to be found again in McDonald’s advertisements or sustainability reports. Media and applied linguistics analyze such reports and advertisements to point out the linguistic strategies that companies implement to be perceived as sustainable (Molino 2020; Stibbe 2023).

This study investigates a corpus of McDonald’s sustainability reports for the years 2021, 2022 and 2023 and simultaneously published advertisements. Against the backdrop of the above-mentioned events, the analysis focuses on McDonald’s linguistic strategy in advertising the “BEST beef program” as well as plant-based meat alternatives. To examine the data, rhetoric categories such as the “appeal to authority” or “semantic hiding and integration” were assessed as part of an applied linguistic approach.

Our central findings are that McDonald’s uses strategies of “appeal to authority” to implement credibility and trust in consumers by using company owned certificates for animal wellbeing or showcasing portraits of farmers detailing their good experiences with the company. The practices of “semantic hiding and integration” are strategically used to shape the dialogue about sustainability: The texts focus on the idea of occasionally eating plant-based meat alternatives instead of advocating for a vegan or vegetarian diet. Regarding the wording, “BEST beef program”, suggests a superior quality of meat even though the word ‘best’ is not used as incremental form of the evaluation ‘good’ but rather an acronym for the program’s slogan.

We draw the conclusion that McDonald’s has changed its way of advertising for meat alternatives drastically as it labeled its products ‘vegan’ in 2021, while in 2022 and 2023 the advertisement was changed to address people who only eat meat occasionally, as McDonald’s plant-based burgers cannot be labeled as vegan nor vegetarian. Concerning the beef, the practice of “semantic hiding and integration” is used to create a better impression of cattle husbandry conditions.

*Keywords:* McDonald’s; Vegan; Sustainability, Advertisement; Linguistic Strategies

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# How does Apple portray its environmental ‘responsibility’ in their Environmental Progress Reports 2013 and 2023?

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## ABSTRACT

Sustainability reports are often criticized for being tools of greenwashing, making it challenging for readers to discern whether a company genuinely integrates sustainable practices into its value chain or merely employs persuasive language. This highlights the importance of examining the semantics of these reports to assess how sustainability concepts are communicated.

Our study adopts a semantic approach to investigate how Apple portrays its corporate and environmental responsibility over time. Focusing on Apple’s *Environmental Progress Reports* from 2013 and 2023, we conducted a qualitative linguistic analysis of the term ‘responsibility’ and the surrounding text (respective paragraphs). This includes semantic and pragmatic presuppositions, found in the co-text.

The analysis focuses on the lemma ‘responsibility’, this means the analysis includes the terms ‘responsibility’ as well as ‘responsible’, and ‘responsibly’ and their explicit usage in the reports. By identifying attributions and self-attributions of responsibility and the object of the responsibility assignment in the surrounding text, we gain deeper insight into the agents of responsibility and Apple’s pragmatic framing of the concept of responsibility. Our findings illustrate how Apple portrays itself and other actors in the context of responsibility while framing its environmental commitment in the *Environmental Progress Reports* from 2013 and 2023.

This study highlights the significance of critically examining the semantics in sustainability reports to differentiate genuine corporate accountability from rhetorical greenwashing, offering critical insights into how companies like Apple construct and communicate their environmental commitment over time.

*Keywords:* Responsibility; Sustainability Report; Semantic Analysis

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Student Presentation

# The Battle for Sustainability: A Semantic and Advertising Analysis of Recup and Vytal

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## ABSTRACT

In the context of growing environmental challenges, companies in the field of sustainability are increasingly innovative and promote waste reduction. This multimodal study examines the advertising strategies of two such brands, Recup and Vytal, which specialize in reusable packaging systems for the gastronomy sector. By addressing single-use packaging waste, these companies actively contribute to the principles of the waste hierarchy: Reduce, Reuse, and Recycle.

This research aims to investigate how Recup and Vytal use communication strategies to promote sustainability and how they encourage sustainable consumer behavior through linguistic and visual techniques. Applying a synchronic approach, the analysis focuses on billboards and Instagram posts created over the past two years. The essence of the study lies in comparing Recup and Vytal using the emotional, declarative, and distinctive communication functions outlined by Inga Ellen Kastens and Peter G. C. Lux in their introduction into branding and organizational linguistics (2014). Additionally, a rhetorical analysis explores persuasive strategies such as calls for action, humor and meme culture. Finally, we contextualize the advertisements within the broader societal sustainability discourses to assess the brands' positioning in environmental debates.

Preliminary findings reveal contrasting communication strategies: Recup addresses a broad societal discourse, promoting collective action through traditional advertisements while also utilizing rhetorical contrasts and meme culture to engage a young and digitally literate audience. In contrast, Vytal employs a direct and approachable tone but has faced criticism for being overly explicit and occasionally using sexually suggestive language. Moreover, Vytal often misses opportunities to reinforce its brand identity within its advertisements.

Overall, this analysis contributes to the understanding of central functions of linguistic and visual strategies in sustainability communication. It emphasizes the importance of aligning communication techniques with sustainability principles to promote environmentally conscious consumer choices and highlights the significance of a coherent brand identity. However, a critical stance may also suggest that such advertising strategies could be too persuasive because they change people's behavior in a predictable way.

*Keywords:* Sustainability Advertising; Multimodal Linguistic Analysis; Waste Hierarchy Model; Brand Identity  
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Student Presentation

# Goal for Green: A Linguistic Analysis of Ecological Goals in the Sustainability Reports of Bayern Munich and Borussia Dortmund

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## ABSTRACT

This study examines the linguistic representation and construction of ecological sustainability goals in the sustainability reports of two successful and well-known German football clubs, FC Bayern Munich and Borussia Dortmund (BVB). Since the 2023/2024 season, sustainability reports are mandatory for the German 1<sup>st</sup> League (1. Bundesliga) in accordance with the requirements of the DFL (German Football League).

The aim of the study is to identify similarities and differences in the linguistic construction of sustainability communication in particular regarding the attitudes and strategic approaches of the clubs concerning ecological sustainability goals. Particular attention is given to the question how and whether the clubs try to avoid their responsibility through the selection of their verbs.

Methodologically, we approach the matter by systematically analyzing certain prominent verbs within the selected sustainability reports. The analysis is divided into three main sections: We analyze morphological aspects including genus verbi and verb types. Furthermore, we concentrate on syntactic structures such as infinitive constructions. In addition, we execute a semantic analysis in which we analyze prominent verbs and their meaning. This approach allows us to investigate the linguistic choices made by the football clubs in representing their sustainability goals, focusing on how the verbs shape the communication of responsibility and commitment to ecological sustainability.

Preliminary findings reveal that both clubs use passive verb constructions to avoid specification regarding the responsible actors for specific actions. While FC Bayern München primarily relies on modal verb constructions, Borussia Dortmund mainly uses infinitive constructions combined with the phrase *our goal is to*. Both strategies seem non-committal making it difficult to verify actions concretely. Additionally, FC Bayern München frequently uses the verbs *plan* and *try*, which refer to hypothetical actions in the future. Overall, both clubs employ similar as well as different strategies to linguistically avoid responsibility.

This study contributes to the understanding of public attitudes towards sustainability and the meaning of sustainability as a topic and a concept in the arena of public associations/sports clubs. As cultural and social actors, football clubs can be considered as multipliers of societal ecological change.

*Keywords:* Linguistic Analysis, Ecological Goals in Sports, Ecological Responsibility, Sustainability Reports

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Student Presentation

# A Multimodal Analysis of Sustainability Communication in Global Food Waste Campaigns

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## ABSTRACT

Food waste is an issue of rising importance, with approximately one-third of global food production being wasted. This highlights the ubiquity of the issue, despite the majority of contributions being made by a limited number of developed nations. In hopes of reducing the present extent of food waste, many nations have established campaigns promoting sustainable food practices.

In this study, we investigate semantic and semiotic aspects of food waste campaigns in order to analyze communicative and linguistic strategies used to drive people towards action. To achieve this, two food waste campaigns, published by two official departments, were compared, being one from Germany ('10 Rules to Avoid Food Waste', 2023), and the other from Australia ('The Great Unwaste', 2024).

Key trends observed from the corpus collected via structural analysis include the use of rhetorical and multimodal elements to help promote food waste reduction. By analyzing the contents of each campaign, rhetorical elements highlighted include antithesis, neologism as well as color and transformation metaphors. For the visual elements observed, anthropomorphism of food was prevalent, along with some imagery used promoting a sense of heroism in the act of saving food. Multimodal elements pair multiple forms of communication, seen in examples such as an anthropomorphized apple asking the viewer if they '...only go for young vegetables', combining visual and linguistic elements to create an effective message on reducing food waste.

By analyzing these different elements of the food waste campaigns linguistically, the findings of this research highlight the elements of effective communication strategies in promoting sustainable food practices. The analysis deals with implications for enhancing planetary health through the fostering of such actions, ensuring that the environmental impacts of food waste are mitigated against.

*Keywords:* Food Waste, Multimodality, Semantic, Semiotics, Planetary Health

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Student Presentation

# “Frac-outs” in the Development of Unconventional Gas Wells”

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## ABSTRACT

The United States now produces more than 32 trillion cubic feet of natural gas each year, due in part to the Energy Policy Act of 2005. The Act specifically exempted the hydraulic fracturing (“fracking”) of oil and gas reserves from the Safe Drinking Water Act. Nevertheless, several different pathways for groundwater contamination by fracking have been recognized. One such pathway is from a “frac-out,” where the frac fluids being injected at high pressures during hydraulic fracturing escape the well being stimulated and communicate with another well. The other well may be an adjacent unconventional well or a conventional well). An frac-out occurred in New Freeport, a small town in the southwest corner of Pennsylvania in June of 2022. Sampling of surface and groundwater (i.e., private water wells) demonstrated fugitive methane migration, and high concentrations of chloride, bromide, lithium, and barium. Methane levels in several water wells exceeded 28 mg/L, along with high concentrations of chloride, bromide, lithium, and barium. Mass ratio analysis based on water chemistry indicated contamination from unconventional brines, indicating that the contamination was a result of the frac-out. Regardless, many of the contaminated wells fell outside the Pennsylvania Department of Environmental Protection’s “rule of presumption” and homes remain without potable water. The investigation thus revealed gaps in Pennsylvania’s environmental policy and regulations as they have failed to safeguard the overall health and well-being of both local community and the environment.

*Keywords:* Frac-out, Unconventional gas, Safe Drinking Water Act

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Student Presentation

# Sustainability Reporting at Duquesne University

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## ABSTRACT

Duquesne University annually completes the Sustainability Tracking, Assessment & Rating System (STARS) report for the Association for the Advancement of Sustainability in Higher Education (AASHE). The Department of Environmental and Energy Engineering (EEE) and University Sustainability Committee (USC) compile data pertaining to Duquesne's academics, engagement, operations, planning and administration, and innovation and leadership. Duquesne has the opportunity to earn points for sustainable practices in each of these sections. AASHE awards partial points for efforts to report any information available to enhance transparency and participation. Duquesne aims to promote sustainability on campus through green operations, construction projects, research endeavors, academic coursework, and community engagement initiatives. Graduate assistants in EEE collaborate with multiple departments at Duquesne to obtain the updated data and information needed for the report each fiscal year. We meet with faculty to gain a deeper understanding of Duquesne's policies and how they relate to sustainability for the university. Duquesne first began completing the STARS report in 2019, earning a bronze rating. While ratings are valid for three years after issuance, Duquesne updates its report annually. In 2021, Duquesne improved its score to a silver rating and landed on the list of the Sierra Club's Cool Schools and Princeton Review's list of Green Colleges. Duquesne aims to achieve gold status in upcoming reports through green efforts, such as the implementation of electric vehicle charging stations on campus in 2024. The STARS report exemplifies Duquesne's dedication as an environmental steward to confront climate change and reduce the consumption of natural resources. The culture of sustainability on campus promotes health and well-being for students and faculty.

*Keywords: sustainability, reporting*

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# Feasibility Analysis for the Implementation of an Anaerobic Digestion System in Pittsburgh, PA

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## ABSTRACT

The primary source of power generation in the United States is by use of fossil fuels (e.g., coal, petroleum, and gas), sourcing roughly 83% of energy consumption as of 2023. With issues surrounding fossil fuel depletion and the impact fossil fuel use has on environmental quality, we must consider alternative energy sources. Biogas, a gas containing methane (40%-70%), carbon dioxide, hydrogen sulfide, water vapor, and other trace gases, can be used as a renewable energy source to aid in the issues of the growing energy demand and depletion of our existing energy sources.

Biogas can be produced through anaerobic digestion, a naturally occurring process in which microbes ferment organic material (algae, animal manure, municipal solid waste, etc.) in the absence of oxygen. This process can be replicated through the use of an anaerobic digestion system, also known as a biodigester. Organic material is added to a tank and undergoes a series of breakdown steps: hydrolysis, acidogenesis, acetogenesis, and ultimately, methanogenesis. The produced biogas can be used for residential heating or other electricity generation. There is also an option to further purify the biogas to produce biomethane, which can be used for transportation fuel or to be put directly into the gas grid. The byproduct of anaerobic digestion is a nutrient rich substance called digestate which can be used as fertilizer or for land irrigation.

The current study is investigating the feasibility of an anaerobic digestion system in Pittsburgh, Pennsylvania, at the old State Penitentiary site located at 1922 Westhall St. This location is immediately upstream of the Allegheny County Sanitary Authority (ALCOSAN) along the Ohio River. The plan is to use the municipal solid waste from ALCOSAN as the main form of feedstock. ALCOSAN produces on average 44,000 tons of dry sludge annually. Based on the volume of dry sludge from ALCOSAN and average chemical makeup of sewage sludge it is estimated that an anaerobic digestion system in Pittsburgh could produce 36,080,000 kWh/ year, which is enough energy to power 3,340-3,436 homes. It is highly anticipated that an anaerobic digestion system will aid in waste management, help the City of Pittsburgh to meet its 2030 Climate Action Plan goals, and have a positive return of investment.

*Keywords:* Anaerobic Digestion, Biogas, Waste Management

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Student Presentation

# Effective Well Water Filtration Systems Treating Contamination from Unconventional Gas Development

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## ABSTRACT

Access to clean and safe drinking water is critical, yet over 3.5 million Pennsylvanians rely on private, unregulated wells for their water supply, with many living in rural areas lacking municipal water infrastructure. Recent research, including data from Duquesne University, indicates a strong correlation between unconventional oil and gas development (fracking) and well water contamination. Common contaminants include iron, manganese, methane, ethane, ethene, and propane, as well as elevated levels of total dissolved solids, all of which pose significant health risks. These issues disproportionately impact low-income communities, where individuals often cannot afford expensive filtration systems or rely on temporary water supplies from industry-provided resources. This research aimed to identify and evaluate effective and cost-efficient water filtration methods to mitigate these contaminants and provide safe drinking water for affected populations. The study tested water filtration systems from Brita, LifeStraw, Aquasana, and Cloud against contaminants associated with unconventional gas development. A goal was to develop a practical, accessible guide for homeowners to select appropriate filtration systems based on contamination profiles and economic feasibility. Although each system removed some of the contaminants, reverse osmosis (RO) proved most effective. However, RO also generated as much waste water as potable water in essence doubling the amount of water required. The findings could provide a transferable framework for other regions in Pennsylvania, Ohio, and West Virginia facing similar challenges.

*Keywords: unconventional gas, well water, reverse osmosis*

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Student Presentation

# Conducting Greenhouse Gas Emissions Inventories at Duquesne University

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## ABSTRACT

Duquesne University completed its eleventh Greenhouse Gas (GHG) Emissions Inventory for fiscal year 2023 (FY 23), which began on July 1, 2022, and concluded on June 30, 2023, continuing the university's commitment to sustainability reporting. This report is compiled annually by graduate assistants in the Department of Environmental and Energy Engineering (EEE). The inaugural report, published in 2006, was the first GHG Emissions Inventory conducted by a university in Western Pennsylvania. This accomplishment motivated other local higher education institutions to conduct GHG Emissions Inventories as well. The annual GHG reports are used to assess trends in Duquesne University's GHG emissions and provide a platform to discuss strategies for reducing the university's carbon footprint. Duquesne University utilizes the Sustainability Indicator Management & Analysis Platform (SIMAP) and adheres to a standardized data collection protocol for direct and indirect emissions sources to complete its GHG emission calculations. The eleventh GHG report indicated that while emissions have generally trended downward since 2018, the 2023 fiscal year marked the first time total emissions per weighted campus user returned to pre-COVID levels. As campus activity normalizes, mitigation strategies will continue to be explored. Key recommendations for Duquesne University to continually lower its carbon footprint include increasing renewable energy use, enhancing energy and water efficiency throughout facilities, promoting sustainable transportation to and from campus, and expanding composting and other offset initiatives. All Duquesne University GHG Emissions Inventories are publicly available, fostering transparency and accountability while informing campus and community members of the university's overall environmental impact and progress toward achieving carbon neutrality. This ongoing initiative highlights Duquesne University's commitment to sustainability and dedication to planetary health.

*Keywords:* Greenhouse Gas, Carbon Neutrality, Reporting

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Student Presentation

# The “Lumbricus” Environmental Bus

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## ABSTRACT

The Lumbricus Environmental Bus, an educational initiative by NUA NRW, serves as a mobile platform to raise environmental awareness and promote sustainability through hands-on learning experiences. As part of our project for the Winter Meeting at the University of Cologne, we conducted an interview with the Lumbricus team to understand their mission, methodology, and real-world impact on environmental education. This initiative is especially relevant in the context of growing environmental challenges, as it addresses the need for innovative educational approaches that engage diverse audiences effectively.

Our contribution includes a 5-minute video presentation that provides an overview of the Lumbricus project's goals, showcases key insights from the interview, and highlights the unique strategies employed by the team. We explore how this mobile educational platform bridges the gap between theoretical environmental concepts and practical applications. By bringing sustainability education directly to schools, communities, and events, the Lumbricus Bus inspires action and awareness across generations.

This project aligns closely with the conference theme by emphasizing the role of interactive, experiential learning in addressing pressing global issues. It offers a blend of conceptual insights, practical applications, and methodological approaches, demonstrating how such initiatives can contribute to fostering a more sustainable society. The video serves as a case study, illustrating the importance of mobile learning platforms in making environmental education accessible and impactful.

*Keywords:* Environmental education, Sustainability, Mobile learning

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Student Presentation

# School of the Future – Education for Sustainability

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## ABSTRACT

In the face of global challenges such as climate change, social inequality, and resource scarcity, Education for Sustainable Development (ESD) has become increasingly important. In our project, we explored the School of the Future initiative, which aims to integrate sustainability into everyday school life. This contribution presents the results of our five-minute video project, which highlights the key aspects of the program and illustrates its goals and implementation in a practical context. The video begins by explaining what Education for Sustainable Development entails and how it empowers young people to actively and responsibly shape their future. It then provides an in-depth look at the School of the Future program, which supports schools in North Rhine-Westphalia in implementing ESD projects and embedding sustainability structurally. The program's primary objective is to raise awareness of sustainable development among both students and teachers and to equip them with the tools needed to drive change on individual and institutional levels. A key feature of our contribution is an interview with a teacher from a school that has been awarded the School of the Future seal. The teacher shares insights into specific projects at their school, such as the implementation of climate protection measures, sustainable teaching methods, and the involvement of the school community in the transformation process. Their experiences demonstrate how ESD can be practiced in real-life settings and reveal the challenges and successes of such initiatives. Our contribution underscores that programs like School of the Future not only transform educational institutions but also make a significant impact on promoting planetary health. The video aims to spark discussions on how such initiatives can be scaled up to further link education, ecology, and social responsibility.

*Keywords:* Sustainability, Education, Empowerment

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**Student Presentation**

**Naturgut Ophoven**

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**ABSTRACT**

Presenting the concept and impact of the NaturGut Ophoven, a designated “BNE-Place” (Place of Education for Sustainable Development), at a climate conference focused on education highlights a practical and replicable model for integrating sustainability into learning. This center exemplifies how environmental education can empower communities, especially younger generations, to adapt sustainable behaviors. Through experiential learning, hands-on workshops, and interactive programs, the center fosters awareness of climate change, biodiversity, and resource conservation. Its alignment with the principles of Bildung für nachhaltige Entwicklung BNE (Education for Sustainable Development) demonstrates how education can be a transformative tool in addressing global climate challenges, making it a valuable case study for climate conferences.

*Keywords:*

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Student Presentation

# Educational theatre for sustainable development

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## ABSTRACT

„Gorilla Theaterprogramme“ is a German organization dedicated to promoting education for sustainable development through engaging and interactive productions. Their plays address various sustainability topics tailored to different age groups from kindergarten to high school. For example, „The Secret of the Vegetable Soup“, which is a theater-based cooking project designed for children aged 4 and older. This play uses a chef and a hand puppet to teach children about regional foods and healthy eating in a fun and attractive way. For older students aged 11 and above, „Fundus 17“ offers an opportunity to explore the 17 Sustainable Development Goals of the United Nations. This play starts with a performance where siblings are cleaning their grandmother’s cellar, prompting discussions about responsible consumption and waste management. By combining theatrical performance with interactive elements like cooking workshops „Gorilla Theaterprogramme“ creates immersive learning experiences that empower young people to understand and address sustainability challenges. The play „Nutrition Heroes“, for example, engages children aged 7 and up and features interactive scenes like a TV duel between nutrients and sugar performed as a rap battle. For the holiday season they offer an adventure-based Christmas program suitable for various age groups. Held at „Gut Clarenhof“, this program includes sensory impressions and opportunities for active participation, creating a unique and memorable experience. Gorilla Theaterprogramme’s unique approach fosters critical thinking, creativity, and collaboration, equipping future generations with the knowledge and skills to create a more sustainable world. They collaborate with other environmental agencies in various cities, offering performances in schools and kindergartens, making education for sustainable development accessible to a wider audience.

*Keywords:* Sustainable Development, Educational Theatre, Youth Engagement

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Student Presentation

# Environmental Education at Gut Leidenhausen

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## ABSTRACT

Gut Leidenhausen, located in Eil, a district of Cologne, is a historical estate that has become a key center for environmental education and nature conservation. Nestled within the scenic Wahner Heide nature reserve, it provides a unique combination of historical charm and modern ecological awareness. Gut Leidenhausen serves as a hub for nature education, offering a variety of interactive and educational programs designed to foster a deeper understanding of ecological systems and sustainable living. Its primary focus is to engage visitors, especially children and young adults, in exploring the natural world through hands-on experiences and informative exhibits.

Schools have the possibility to take trips to Gut Leidenhausen to take part in one of the many environmental educational programs. For example, the so called "House of the Forest". This center, dedicated to environmental education, offers interactive displays, workshops, and guided tours focused on forests, wildlife, and sustainable forestry practices. Visitors can learn about local flora and fauna, the importance of biodiversity, and the role of forests in mitigating climate change.

Another example for the many activities to do at the center is the Raptor Station. It's a key attraction, where injured birds of prey and owls are rehabilitated. Visitors have the chance to observe these majestic creatures up close while learning about their habitats, behaviors, and the importance of protecting them. Educational programs here emphasize species conservation and human impact on wildlife.

Gut Leidenhausen exemplifies the fusion of historical preservation with forward-looking environmental education. By connecting people to nature and equipping them with knowledge about sustainability, it plays a vital role in fostering environmental awareness and action for a greener future.

*Keywords:* Education, Environmental Awareness, Wildlife, Biodiversity

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Student Presentation

# Democracy International Köln

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## ABSTRACT

Democracy International is a German based non-governmental organization (NGO) that focuses on enhancing democratic processes beyond traditional electoral systems. The organization's primary goal is to empower citizens with more direct involvement in political decision-making, extending their influence beyond the act of voting every few years.

They also advocate and promote various instruments of direct democracy, such as referendums, citizens' initiatives. These tools aim to give citizens a more active role in shaping policies and legislation. Furthermore, they support mechanisms that allow for ongoing citizen engagement in governance, including participatory budgeting and e-democracy platforms. These approaches seek to create a more collaborative relationship between citizens and their governments.

Recognizing the urgency of climate issues, Democracy International works to address environmental challenges from a political perspective. Moreover, they focus on raising awareness, educating the public, and promoting democratic tools to tackle climate-related problems.

Through projects like "Life as an Activist", the organization draws lessons from experiences in regions such as Latin America, connecting these insights to direct, participatory, and deliberative democratic tools. This initiative aims to inspire and motivate young people by demonstrating how established democratic tools can effect change. By promoting these various forms of citizen engagement and democratic innovation, they strives to create a more responsive and inclusive political system. Their work emphasizes the potential for citizens to actively shape their societies when given the right tools and opportunities for participation.

In conclusion, Democracy International's mission is to strengthen democracy and citizen participation globally, connect activists across borders, and build a powerful democracy movement.

*Keywords:*

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Student Presentation

# Education, economy and environment in harmony: the work of WEED

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## ABSTRACT

The Berlin-based organization WEED (World Economy, Ecology & Development) has been doing groundbreaking work at the interface of business, education and the environment for over three decades. In the context of the conference theme “Innovative Approaches for a Sustainable Future”, WEED is particularly relevant as its interdisciplinary activities bridge the gap between scientific analysis, political influence and practical educational initiatives.

A central focus of WEED is the promotion of sustainable financial systems and responsible business practices. The organization analyzes critical global supply chains and their impact on social justice and environmental stability. It advocates for policy reforms, such as the introduction of stricter guidelines for sustainable investments or the regulation of resource consumption in industry.

A further contribution of WEED to the promotion of sustainable development lies in its educational work. The organization develops and implements workshops, teaching materials and educational projects aimed particularly at schools and universities. These activities promote awareness of the systemic links between the economy, society and the environment and support the learning of critical thinking.

This paper presented the methodology and impact of current WEED projects and discussed their relevance for the development of sustainable strategies. The analysis combines empirical findings from practical educational work with concepts of sustainable economic policy. WEED offers a vivid example of how interdisciplinary action can make a concrete and sustainable contribution to solving global challenges.

*Keywords:* Sustainability, education, economic policy

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Student Presentation

# Nature Conservation and Environmental Education (Sara Kehmer, Researcher at ABU)

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## ABSTRACT

The ABU (Arbeitsgemeinschaft Biologischer Umweltschutz) is an organization for nature conservation based in North-Rhine-Westphalia. The ABU is dedicated to the protection of biodiversity and the promotion of sustainable land use practices. It conducts various activities such as habitat restorations, environmental education and scientific research on flora and fauna. The organization manages several nature reserves and engages in projects to preserve endangered species and ecosystems. This video focuses on the cartography of plant species. This means the mapping and visualization of the geographic distribution of various plant species across specific areas. The intention is to support conservation planning by identifying areas in need of protection. The ABU organizes educational campaigns to raise awareness about environmental matters also in collaboration with schools. The organization encourages active participation through workshops and interactive activities. An example is detecting the noise of bats or planting trees. It further addresses local environmental challenges in presentations and organizes excursions to natural habitats such as forests or wetlands where participants can observe species in their natural environment. Another intention of the organization is teaching species identification skills and increase the ability of students to recognize, classify and understand various local plants and animal species. To implement this the ABU uses real life examples and encourages hands-on exploration to complement theoretical knowledge with practical identification exercises. The ABU wants to highlight the importance of species in ecosystems and their roles in biodiversity to encourage the participants of campaigns to use their knowledge to protect and conserve species in their local areas.

*Keywords:* Nature Conservation, Species Identification, Environmental Education

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Student Presentation

# Green Oases Amidst Concrete Jungles: Modelling UHI Intensity and Green Space Effectiveness in Pune City

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## ABSTRACT

Rapid urbanization presents significant challenges to planetary health, with Urban Heat Islands (UHIs) intensifying vulnerabilities in cities like Pune, India. This study investigates the cooling potential of urban green spaces, focusing on their role in mitigating UHI effects through biophysical processes such as evapotranspiration and albedo. Using the InVEST Urban Cooling Model, spatial analyses were conducted to visualize and interpret outputs, providing critical insights into areas most in need of ecological interventions. Traditional metrics, including Land Surface Temperature (LST) in correlation with indices such as NDVI, and NDWI, often fail to explain the dynamics of certain region experiencing increased temperature. By implementing the InVEST model it provides diversity of spatial structures to understand this phenomenon, this research emphasizes the importance of visualization and interpreting in identifying zones critically lacking greenery, offering planners actionable insights to address ecological disparities.

Urban green spaces are revealed as essential elements for building sustainable urban ecosystems. Beyond cooling, they provide multifunctional benefits: enhancing biodiversity, improving public health, reducing energy consumption, and fostering socio-economic equity. This study underscores the transformative potential of green infrastructure in adapting cities to climate challenges while advancing ecological and economic priorities. By visualizing and interpreting model outputs, this research bridges the gap between data and decision-making, empowering policymakers to prioritize targeted effective green interventions. Goals of promoting climate-adaptive urban environments that balance ecological integrity and economic resilience. Investing in urban greenery informed by advanced spatial modelling ensures efficient resource allocation and sustainable outcomes. This framework supports urban planners and decision-makers in creating cities that harmonize ecological, economic, and social priorities, offering a resilient pathway to planetary health amid the challenges of urbanization and climate change.

*Keywords:* Heat mitigation, cooling capacity, LST, Urban heat island, green spaces

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Student Presentation

# Islands of Persistence: Assessing the Occupancy of Key Tiger Prey Species in the Fragmented Habitats of Wayanad

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## ABSTRACT

This study investigates the complex relationship between habitat fragmentation, prey species distribution, and tiger conservation in the Chedleth Range of the South Wayanad Forest Division, Kerala. As apex predators, tigers depend on stable prey populations and connected landscapes, making their conservation critical for ecosystem health. Through camera traps, field surveys, and spatial analysis, we examined how landscape factors such as NDVI and elevation affect the occupancy of key prey species, including Chital, Gaur, Barking Deer, Sambar, and Wild Pig. The findings suggest that adaptable species like Chital, Wild Pig, and Barking Deer thrive in fragmented, vegetated habitats, while Gaur and Sambar prefer larger, more contiguous forests. Spatial models revealed high-probability zones for tiger presence, often coinciding with fragmented, human-dominated landscapes.

These results underscore the importance of addressing habitat fragmentation to support prey populations, sustain ecological functions, and mitigate human-wildlife conflict. The study emphasizes the need to reconnect isolated habitat patches through wildlife corridors to foster coexistence between wildlife and human communities. Strengthening these ecological linkages will enhance prey availability and ensure the long-term survival of tigers in the region. This research provides actionable strategies that integrate habitat restoration, sustainable land-use practices, and community engagement, offering a holistic approach to biodiversity conservation. The findings contribute to the development of effective conservation strategies in one of India's most ecologically significant regions.

*Keywords:* Habitat fragmentation, prey species, spatial analysis, wildlife corridors, biodiversity conservation, ecological linkages

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Student Presentation

# The Lost Touch: Extinction Of Experience And Its Impacts

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## ABSTRACT

This study investigates the phenomenon of “Extinction of Experience” and its impact on conservation attitudes among students across diverse demographic and geographic context in India. Given the growing concern about urbanization and modern lifestyles, this study explores how reduced direct interaction with nature affects nature connectedness and conservation attitudes, especially among children and adolescents in both rural and urban landscapes. The main objectives are to understand the factors influencing nature experiences and nature connectedness and to analyse how nature connectedness can shape attitudes toward biodiversity conservation.

Using a mixed-methods approach, the research combines both qualitative and quantitative data collection to evaluate the relationships between nature experience, nature connectedness, and conservation attitudes. The study incorporates innovative tools, including a multi-item version of the Inclusion of Nature in Self (INS) scale and a bingo game, to assess the different levels, pathways and indicators of nature connectedness.

The findings of the study emphasize that more immersive and unstructured means of engaging with nature result in higher connectedness to nature and its elements, eventually contributing to positive conservation attitudes. Experiential and exploration-based nature education initiatives that instil an emotional connection with nature and promotes a sense of responsibility towards the environment is the need of the hour. This research highlights the importance of integrating nature-based education into school curricula and provides insights into designing innovative interventions to strengthen nature connections and foster environmentally conscious attitudes among the younger generation. By addressing the intersection of ecology, education, and social behavior, this study aligns with the overarching theme of the conference, emphasizing that fostering nature connectedness among youth is a critical pathway to achieving planetary balance and health.

*Keywords:* Extinction of Experience, Nature Experience, Nature connectedness, 5 pathways to nature connectedness, Conservation Attitudes

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Student Presentation

# Fragmented Yet Vital: The dynamics of urban green spaces and birdlife in Pune

Vaidehi Mehta

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## ABSTRACT

Urbanization poses significant challenges and opportunities across health, environment, and education, deeply influencing biodiversity in rapidly expanding cities like Pune. Urban green spaces, though fragmented, serve as vital ecological lifelines, supporting avian diversity and acting as indicators of environmental health. This study investigates the relationship between green patch size, structural complexity, and bird diversity to address gaps in urban biodiversity research.

Using GIS mapping, FRAGSTATS, field surveys, and statistical modeling, we found that patch size positively influenced bird diversity ( $r = 0.46$ ), with larger patches supporting greater species richness. Interestingly, smaller patches with higher structural complexity also exhibited notable avian diversity, emphasizing habitat quality's importance alongside size. Urban disturbance negatively correlated with bird diversity ( $r = -0.38$ ), revealing the detrimental effects of habitat fragmentation and human activity. Guild richness emerged as a critical factor, explaining 86% of the variance in bird diversity and offering a comprehensive view of urban ecosystem health.

This research underscores the need to conserve both large and small green spaces, enhance connectivity, and improve habitat structures. These measures are crucial for supporting urban biodiversity and ensuring sustainable ecosystem health in rapidly urbanizing landscapes.

*Keywords:* Urban green spaces, Avian diversity, Urbanization, Habitat quality, Biodiversity conservation, Sustainable planning, Pune, Guild richness

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Student Presentation

# Developing a framework for facilitating and institutionalizing learning spaces for climate change in schools

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## ABSTRACT

Climate change is one of the greatest challenges that human society has had to experience in the recent past. It is evident that Communication, Education and Public Awareness is the only means of using participatory actions to deal with adaptation and mitigation to climate change. At the grass root level Eco sensitive areas like Western ghats are the primary target of disasters due to climate change. The Education for Climate Action Program supported by the TATA Trusts provides a unique opportunity to sensitize local children, youth and the local community with knowledge, skill sets and actions on climate change. This current education program has been oriented towards introducing climatology, climate change, its causes and effects and Climate Actions for students across the 35 schools of Western ghats region. The approaches used for the program is the Head, Heart and Hand pedagogy and Competency based learning. For designing the modules and activities a pre evaluation questionnaire was designed for the students as well as teachers. Their, 'ways of thinking', 'practicing' and 'being' competencies towards climate- change and action were assessed. The questionnaire revealed that students had a basic ways of practicing and being competencies but lacked the ways of thinking competency, the major challenge being functional inconsistencies that came with the Covid19 pandemic. Rural schools had no access to connectivity and technology, so without the online approach to learning, they are facing a large gap in reading, writing, syllabus continuity and theory knowledge. Content analysis of the science and geography (Class 6<sup>th</sup> to 8<sup>th</sup>) textbooks was carried out and it showed some of the important terminologies are only mentioned and not explained which can lead to knowledge gap. Therefore the modules, workshops and activities designed and implemented in the program fostered transformational change of embedding competencies and skills required to tackle climate change in students and teachers.

*Keywords:* climate change education, knowledge–action gap, Climate action

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# Navigating Sustainability: Spatial Thinking as a Pathway to Planetary Health

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## ABSTRACT

In the Anthropocene era, where environmental challenges intersect with socio-economic changes, spatial thinking emerges as a powerful tool for fostering sustainable development. The program on spatial thinking, developed in collaboration with the Department of Science and Technology (DST), Government of India, aligns with the objectives of the National Geospatial Policy 2022 and the National Education Policy 2020.

The National Geospatial Policy 2022 focuses on democratizing geospatial data, fostering innovation, and enhancing geospatial literacy across sectors, including education. Similarly, the National Education Policy 2020 emphasizes competency-based, experiential, and interdisciplinary learning to address pressing global challenges. This program integrates these visions by embedding geospatial concepts within school curricula, equipping educators and students with tools to think spatially and act sustainably.

Partnering with approximately 13 State Councils of Educational Research and Training (SCERTs), the program conducted training sessions on open-source geospatial tools, empowering teachers to apply spatial thinking across subjects such as geography and science. The use of smartphones for mapping and analysis enhances accessibility, fostering participatory learning and engagement. Aligned with global sustainability goals, the initiative enables students and teachers to contribute meaningfully to environmental actions.

By empowering educators and students to utilize spatial thinking as a decision-making tool, the program fosters critical problem-solving skills and collaborative approaches to real-world challenges. This initiative bridges national policies with grassroots action, cultivating competencies for sustainable development and advancing planetary health.

*Keywords:* Spatial Thinking, Planetary Health, SDGs, environment education, education for sustainable action



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