

Ecological and energy narratives in contemporary literature: interpreting the climate agenda in the context of sustainable development

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Abstract. Global climate changes, the increasing degradation of natural ecosystems and increased pace of the energy transition have necessitated a broader approach to interpreting environmental issues not just from a natural science perspective, but also from a humanistic perspective. In this context, contemporary fiction is an important venue for the production of ecological and energy-related narratives that communicate people's beliefs about climate risks, changes in energy systems, and the potential for sustainable development. The aim of this study is to determine the structural characteristics of the representations of ecological and energy issues in contemporary fiction, and to evaluate these narratives within the framework of the global climate agenda and sustainable development. Methodologically, this research draws upon an interdisciplinary approach combining discourse analysis of literary texts with thematic coding of the narrative structure; and comparing literature with empirical measures of environmental and energy phenomena. The findings of this study demonstrate that literary texts create an elaborate set of ecological images; where climate change, the energy transition, and degradation of the natural landscape are depicted in relation to social, cultural; and technological changes. The practical value of this research lies in its contribution to expanding the tools available for environmental communication and in the use of literature as a means to improve public understanding of sustainable development, energy transition, and climate adaptation.

1 Introduction

Climate change, anthropogenic pressure on natural ecosystems and changing energy systems have resulted in a paradigm shift in how researchers examine environmental processes from both a scientific and sociocultural perspective. There's a growing focus among academics that looks at the social mechanisms related to how people perceive climate risks and how those perceptions impact both the efficacy of environmental policy and the ability to transition away from high-carbon energy use [1-3].

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As reported by international energy organizations, global CO₂ emissions resulting from the energy sector reached 36.8 B tonnes during 2022, indicating that the world economy is still highly dependent upon fossil fuels for energy. In contrast, the development of renewable energy sources has accelerated with the emergence of a new global energy system.

Scholarship has increasingly provided attention to what are referred to as ecological narratives - structured representations of the reciprocal relationship between society and the ecosystem. These narratives take many forms and are created in various communicative contexts, including academic articles, media reports, public policy documents and cultural practices. Fiction is particularly noteworthy within this system because works of literature have the potential to model ecological scenarios, illustrate the impacts of technological innovation and construct symbolic representations of ecological crises [4, 5].

With the emergence of environmental humanities comes a new area of research focused on how literature, art, and cultural activities depict nature's processes. This methodological approach views literary texts as models of cognition about ecological realities that convey both public views on environmental changes as well as perceptions regarding energy transformations.

There is a great deal of variety within current literature, particularly in regard to ecological and energy narratives. Some of the literature addresses the effects of climate change, such as global warming, desertification, and degraded freshwater sources. Other forms of literature concentrate on both the social and technical implications resulting from transitioning energy use through new energy systems and changing industries.

As such, climate fiction plays a significant role when creating ecological narratives, since these pieces of literature represent possible future scenarios resulting from global climate change [6, 7].

The goal of this research is to explore the structural components that comprise both ecological and energy narratives in contemporary literature and determine how they contribute to constructing sustainable development's climate agenda.

2 Materials and methods

The research strategy is developed on a chronological basis which consists of different methodological stages that help to organize knowledge and understanding of ecological narratives before analyzing literary works that depict/represent issues associated with climate change/energy transitions. The way this kind of research is designed ensures that there is a logical connection between the theoretical basis for the field of Environmental Humanities and the empirical assessment of current literary works.

During the first phase of the project, all of the published literature relating to ecological narratives, climate literature and energy transition's relation to the humanities were organized in a systematic manner. To create a representative sample for the scholarly work being conducted, international bibliographic databases, such as Scopus, Web of Science Core Collection and Google Scholar, were used to provide access to peer-reviewed literature in the field of Environmental Humanities, Ecological Communication and Climate Fiction. The literature search relied on several key terms, including "environmental narratives", "climate fiction", "energy humanities", "environmental communication", and "literature and climate change". Particular attention was given to studies published between 2016 and 2024, since that period saw rapid growth in research linking environmental studies, cultural analysis, and energy policy. In total, around 120 academic sources were reviewed, including articles from journals indexed in Scopus and Web of Science, together with several monographs on environmental humanities. The review made it possible to identify the main approaches used to interpret literary texts in relation to ecological and energy issues, as well as the dominant forms of environmental narrative in contemporary writing.

At the next stage, a corpus of literary works on environmental themes was compiled. The selection focused on climate fiction, environmental literature, and texts connected with the energy humanities, all of which have become increasingly visible in world literature since the early twenty-first century. Literary works were identified through international catalogues and databases, primarily WorldCat, Google Books, and specialized bibliographies devoted to climate-related literature.

The final corpus included 15 texts published mainly between 2000 and 2022. The chosen period reflects the growing literary interest in climate change, sustainable development, and energy transition. The selected works represent different genres of contemporary prose, yet all of them place environmental and energy-related processes at the center of the narrative.

The analysis drew on several widely known works of contemporary literature that address environmental and energy-related issues. The selected texts included “Oryx and Crake” by Margaret Atwood, which explores the consequences of biotechnology and climate change; “Solar” by Ian McEwan, focused on the social and scientific aspects of solar energy; “New York 2140” by Kim Stanley Robinson, which examines the impact of sea-level rise on the future city; “The Overstory” by Richard Powers, centered on forest ecosystems and their destruction; and “The Ministry for the Future”, which presents a literary vision of climate policy and the global energy transition.

Several considerations guided the choice of these texts. First, each work gives considerable attention to environmental change, including climate warming, ecosystem degradation, and shifts in energy systems. Second, all of the selected novels are widely discussed in environmental humanities research and are frequently cited in studies of climate fiction and ecological literature. Finally, the works differ in narrative style and in the way environmental problems are presented. Such diversity makes it possible to compare different literary approaches to the same ecological challenges.

Taken together, the reviewed academic sources and literary texts form the empirical basis of the study. Their combined use allows scientific descriptions of environmental processes to be compared with the ways those processes are represented in literature. As a result, the selected corpus provides a clear foundation for the later discussion of ecological and energy narratives in the Results and Discussion section.

2.1 Methods of discourse analysis of literary works

After the literary corpus had been formed, the next stage of the study focused on identifying the main features of ecological and energy narratives through discourse analysis. The choice of this method is explained by the fact that the selected novels are considered not only as works of fiction, but also as forms of communication that reflect public ideas about the relationship between society, nature, and energy systems.

The methodological framework combines the principles of environmental humanities and critical discourse analysis. Both approaches are widely used in research on environmental communication and climate narratives because they make it possible to examine how texts create meanings related to environmental change, technological development, and social transformation. In recent studies, similar methods have been applied to the analysis of climate change in media, literature, and public discourse [8,9].

The analysis was carried out in three successive stages.

At the first stage, thematic coding was used. Each literary work was examined in detail in order to identify repeated themes connected with environmental and energy processes. To organize the material, several thematic groups were established:

- climate change and environmental consequences;
- ecosystem degradation and biodiversity loss;
- transformation of energy systems;

- social and political dimensions of sustainable development;
- technological scenarios of the energy transition.

Coding was performed at the level of key episodes, descriptions of landscapes, and fragments devoted to environmental problems or energy technologies. Such an approach made it possible to determine how often particular ecological themes appeared in different works and which topics occupied a central place in the narrative.

At the second stage, narrative analysis was applied. The purpose of this procedure was to examine how ecological plots are constructed and how literary texts explain environmental change. Particular attention was given to the causes of climate change, the consequences of ecosystem degradation, and the possible futures presented in the novels.

Several elements of the narrative structure were analyzed:

- - the type of natural landscape described in the text;
- - the form of ecological crisis underlying the plot;
- - the role of energy technologies in the development of the story;
- - the interpretation of the relationship between society and the natural environment.

The use of narrative analysis made it possible to distinguish several recurring models of ecological storytelling. Among them were the narrative of environmental catastrophe, the narrative of technological adaptation, and the narrative of sustainable development.

At the final stage, interpretative comparative analysis was employed. The purpose of this procedure was to compare literary representations of ecological and energy processes with real environmental trends recorded by international organizations. For that reason, the study used statistical data on greenhouse gas emissions, changes in the global energy mix, and investment in the energy transition.

The comparison between literary plots and empirical indicators helped to determine how closely the selected novels correspond to actual developments in the climate and energy system. Such an approach connects qualitative literary analysis with quantitative environmental evidence and therefore allows literary texts to be examined as part of a broader system of environmental communication.

Consequently, the combined use of thematic coding, narrative analysis, and comparative interpretation provides a more complete understanding of ecological and energy narratives in contemporary literature. The chosen methods make it possible to identify the main themes, compare different narrative models, and relate literary interpretations of climate change to real environmental processes [10].

3 Results and discussion

The use of thematic coding, narrative analysis, and comparative interpretation of literary texts together with environmental and energy data made it possible to identify the main features of ecological and energy narratives in contemporary literature. The analysis was based on fifteen works of climate fiction and environmental literature published between 2000 and 2022.

Thematic coding showed that several ecological themes appear repeatedly throughout the selected texts. Although the novels differ in genre and plot, they share a common tendency to interpret environmental change through broader social, technological, and political processes. As a result, contemporary literature presents ecological problems not as isolated natural events, but as part of a wider transformation affecting society, energy systems, and patterns of human behavior.

3.1 Thematic structure of ecological narratives in contemporary literature

Thematic coding also made it possible to estimate how often different environmental themes occur in the selected literary works. During the analysis, particular attention was given to episodes describing climate change, the degradation of ecosystems, changes in energy systems, and different forms of sustainable development. The frequency of such episodes helped to determine which ecological topics occupy the most important place in the narrative structure of contemporary environmental literature.

Table 1. Frequency of ecological and energy-related themes in the analyzed corpus of literary works.

			Robinson, New York 2140; Atwood, Oryx and Crake
			Robinson, The Ministry for the Future

The results show that climate change is the most common theme in the analyzed texts and appears in 87% of the selected works. Such a high share indicates that climate-related issues occupy a central place in contemporary literary and public discourse.

The second most frequent theme is ecosystem degradation. The analyzed works often describe the loss of biodiversity, the destruction of forests, and changes in agricultural landscapes caused by human activity and environmental pressure.

The third most common theme is the energy transition. References to renewable energy, the decline of fossil fuels, and the restructuring of energy systems appear in many of the texts, which points to the growing importance of energy issues in contemporary literature.

3.2 Narrative models for interpreting climatic processes

Narrative analysis revealed several recurring ways in which contemporary literature explains environmental change.

The most common model is the narrative of ecological catastrophe. Within this pattern, climate change appears as a large-scale process that transforms both nature and society. Such a narrative is especially visible in Oryx and Crake and New York 2140, where environmental crisis develops gradually as a result of long-term human pressure on the climate and ecosystems.

The second major model is the narrative of technological adaptation. In this case, the solution to environmental problems is linked to new energy technologies and low-carbon innovation. A clear example appears in Solar, where the transformation of the energy system is connected with scientific research and the development of solar power.

The third model is the narrative of sustainable development. Such texts focus on the search for a balance between economic growth, technological progress, and the protection of natural resources. In The Ministry for the Future, this approach is expressed through the description of international climate policy, financial regulation, and new forms of global cooperation aimed at climate adaptation.

3.3 Comparison of literary narratives with environmental and energy indicators

To determine how closely literary representations of climate change correspond to real environmental developments, the identified narrative models were compared with global environmental and energy indicators. Particular attention was given to trends in greenhouse gas emissions, changes in the structure of the world energy system, and the growth of renewable energy. Such a comparison made it possible to evaluate whether the environmental scenarios presented in contemporary literature reflect the actual direction of climate and energy change.

Table 2. Global environmental indicators and corresponding literary interpretations.

Global CO ₂ emissions			
Share of renewables in generation			
Investment in the energy transition			

The data in the table indicate a clear connection between real environmental change and the themes found in contemporary literature. Rising greenhouse gas emissions and the intensification of climate change are reflected in many works of climate fiction, where the plot is built around environmental instability, extreme weather events, and large-scale ecological crisis.

At the same time, the growing share of renewable energy and the increase in investment in the energy transition have encouraged the emergence of a different narrative model. In such texts, attention shifts from catastrophe to possible solutions, and technological innovation becomes the main response to environmental challenges.

3.4 Interpreting the role of literary narratives in environmental communication

The comparison of literary texts with environmental data shows that fiction can be viewed as an important part of environmental communication. Literary works help translate scientific information about climate change and energy systems into stories that are easier for a wider audience to understand.

A major advantage of literature is its ability to connect scientific facts with their social and cultural consequences. While scientific reports usually present data and forecasts, novels create vivid images of possible futures and show how environmental change affects everyday life, society, and human behavior. For that reason, literary texts often have a stronger emotional impact and can increase public awareness of environmental risks.

The analysis therefore suggests that contemporary fiction serves as a bridge between scientific knowledge and public understanding. By presenting climate change and the energy transition in narrative form, literature contributes to the development of broader and more stable ideas about current environmental challenges [11, 12].

4 Conclusions

The study showed that contemporary fiction plays an important role in explaining climate and energy issues. Literary texts do more than describe environmental problems. They help readers understand climate change, ecosystem degradation, biodiversity loss, and changes in energy systems through stories and characters.

The analysis demonstrated that modern literature reflects the main environmental challenges of the twenty-first century. Climate change, the destruction of natural ecosystems, and the transition to new energy sources appear repeatedly in the selected works. In this way, fiction creates recognizable images through which society interprets environmental and technological change.

A comparison of literary plots with real environmental indicators also revealed a clear connection between fiction and actual global trends. Rising carbon emissions, the growing role of renewable energy, and increasing investment in the energy transition are all reflected in literary descriptions of climate instability, technological change, and the search for new forms of development.

Several recurring narrative patterns were identified in the analyzed texts:

- - environmental degradation, focused on the consequences of human impact on nature;
- - climate transformation, centered on long-term changes in the global climate;
- - energy transition, describing the social and technological effects of moving toward low-carbon energy;
- - sustainable development, based on the idea of balancing economic growth, technological progress, and environmental protection.

The main value of the study lies in its interdisciplinary approach. The combination of methods from environmental science, energy studies, and literary analysis makes it possible to view fiction as part of a broader system of environmental communication. Literature influences how people imagine climate risks and possible environmental futures.

The results may also be useful in practice. Literary works can be applied in environmental education, public communication, and discussions of sustainable development. Because fiction presents environmental problems in a vivid and emotional form, it often helps readers understand complex issues more clearly than scientific data alone.

Overall, the research objective was achieved. The study confirmed that ecological and energy narratives in contemporary literature are closely connected with real changes in the global climate and energy system. The results also provide a basis for further research on the role of literature and culture in shaping environmental awareness and climate policy.

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