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Narrating vulnerability: Climate fiction and adaptation in Robinson's *The Ministry for the Future*

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Abstract

Climate change, also known as the climate crisis or climate emergency, is a global threat to nations' economic, environmental, political fabric, causing insecurity and endangerment. This crisis is exacerbated by environmental cataclysms like hurricanes, cyclones, floods and coastal erosion, which in recent times have become more severe and frequent, highlighting the extent of human intervention in the earth's degradation. Addressing this crisis requires a unified effort. Climate fiction, often abbreviated as cli-fi, is a literary genre that explores the effects of climate change, environmental degradation and ecological themes, blending elements of science fiction, speculative fiction and contemporary literature. This paper explores the role of climate fiction (cli-fi) in shaping public consciousness and discourse on environmental vulnerability and adaptation strategies, using Kim Stanley Robinson's *The Ministry for the Future* as a central text. The novel serves as both a speculative and strategic lens, presenting interconnected narratives of environmental collapse, technological resilience, and global political transformation. This study finds that the climate fiction serves as a kind of literary activism that influences public imagination in the direction of ecological resilience, ethical action, and sustainable futures.

Keywords: Climate breakdown, environmental degradation, sustainable future, natural systems, socio-political dynamics

1. Introduction

Climate change, also known as the climate crisis or the climate emergency, is no longer a distant threat forecasted by scientists; it is a stark reality that is reshaping ecosystems, economies, and societies across the globe. One of the most pressing and complex challenges of the 21st century is - climate change endangers the political, social, and economic fabric of countries, resulting in increasing instability and systemic risk. This crisis, rooted in anthropogenic activities such as industrialization, deforestation, overconsumption of resources, and the relentless burning of fossil fuels, is unfolding at an alarming pace, exacerbated by environmental cataclysms such as hurricanes, cyclones, floods, droughts, and coastal erosion. These disasters, now more frequent and severe, serve as potent reminders of humanity's extensive and often exploitative intervention in Earth's natural systems^[1, 2].

The Intergovernmental Panel on Climate Change (IPCC) has asserted that "human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1 °C above 1850-1900 in 2011-2020." The report presents a grim forecast: if current trends continue unchecked, the Earth is projected to warm by more than 2.8 °C by the end of the 21st century (UNEP). Such an increase is anticipated to trigger catastrophic

and irreversible consequences, including but not limited to the melting of glaciers, sea-level rise, biodiversity loss, and large-scale displacement of human populations. The implications of these phenomena stretch beyond environmental degradation; they pose a serious threat to water security, agriculture, food supply chains, human health, and the geopolitical stability of nations. The consequences of climate change transcend borders and social categories, disproportionately affecting vulnerable populations in developing countries, indigenous communities, coastal settlements, and low-income households. These groups face heightened exposure to climate-related hazards and often lack the adaptive capacity to cope with such stressors. Long-lasting droughts can jeopardize agricultural productivity and food security, while flooding and rising sea levels can contaminate water sources, displace entire

communities, and spread vector-borne diseases. Arctic and Antarctic regions are warming at twice the global average, with polar ice caps melting at unprecedented rates. The world's oceans, absorbing approximately 40% of atmospheric carbon dioxide, are becoming increasingly acidic, endangering coral reefs, marine ecosystems, and fish populations [2, 3, 4].

Efforts to address this crisis have been institutionalized at multiple levels. The United Nations Framework Convention on Climate Change (UNFCCC) and its key protocols-the Kyoto Protocol and the Paris Agreement-represent major international commitments to mitigate global warming. The Paris Agreement, adopted in 2015 during COP21, seeks to limit global temperature increases to "well below 2 °C above pre-industrial levels," ideally keeping the rise to 1.5 °C.

Sustainable Development Goal 13 urges nations to "take urgent action to combat climate change and its impacts." These efforts reflect a growing consensus that coordinated, systemic change is necessary to alter the current trajectory. Still, many experts warn that these initiatives fall short of what is needed, hindered by political inertia, insufficient funding, and lack of enforcement mechanisms. Beyond policy frameworks, grassroots activism has played a significant role in mobilizing public awareness and pressuring governments to act. Through school strikes, public speeches, and international advocacy, they highlight the intergenerational dimensions of the crisis where today's youth are inheriting the consequences of past and present inaction. Their activism raises critical questions about justice, equity, and the ethical obligations of the current generation to safeguard the planet for future ones [4, 5].

In this context, literature becomes a potent tool for reimagining climate realities, shaping public discourse, and inspiring ecological consciousness. Literary works that engage with environmental themes are increasingly recognized as part of a growing genre known as climate fiction or "cli-fi." This genre combines speculative, dystopian, and science fiction with ecological thought to explore the multifaceted impacts of climate change. Through narrative, climate fiction renders abstract scientific data into emotionally resonant stories, helping readers grasp the human stakes of ecological collapse. By foregrounding characters, emotions, and sociopolitical dilemmas, cli-fi makes climate change a personal, lived experience, fostering empathy and understanding.

One of the most significant contributions to climate fiction in recent years is *The Ministry for the Future* (2020) by Kim Stanley Robinson. This novel weaves together science, politics, economics, ethics, and environmentalism into a sweeping, multi-perspective narrative that speculates on plausible responses to climate change over the next few decades. Structured around the titular institution-a fictional international organization established under the aegis of the United Nations-the novel dramatizes the challenges and opportunities involved in global climate governance. Through a wide cast of characters and episodic storytelling, it examines technological innovation, policy reform, geo-engineering, ecological restoration, and grassroots resistance as potential paths forward.

Central to Robinson's narrative is the idea of intergenerational justice-the moral responsibility to ensure that future generations inherit a habitable planet. The novel

opens with a harrowing depiction of a deadly heat wave in India, killing millions, and catalyzing urgent political action. This visceral portrayal of climate-induced suffering sets the tone for the rest of the novel, underscoring the human costs of environmental inertia. From climate refugees and eco-terrorists to economists and activists, Robinson's characters represent a wide spectrum of voices, each grappling with the ethical, political, and existential dimensions of a world on the brink.

Ecocriticism-the theoretical framework employed in this paper-offers a lens through which to analyze *The Ministry for the Future*. As a branch of literary criticism that explores the relationship between literature and the environment, ecocriticism emphasizes how texts reflect, challenge, or reinforce human attitudes toward nature. It interrogates anthropocentrism, critiques environmental degradation, and promotes ecological awareness. In applying eco-criticism to Robinson's novel, this paper seeks to unpack the narrative strategies used to depict climate change, the ideological tensions embedded in the story, and the ways in which literature can function as a form of environmental activism [5, 6, 7].

Moreover, *The Ministry for the Future* compels readers to consider the intersections of science, policy, ethics, and storytelling in confronting the climate emergency. It questions the adequacy of existing institutions, the morality of radical interventions like geoengineering, and the potential of collective imagination to envision a sustainable future. As climate change continues to reshape the contours of human civilization, literary explorations such as Robinson's become indispensable tools for cultivating resilience, empathy, and hope. This paper is organized as follows: Section II explores the literary and historical context of climate fiction, situating *The Ministry for the Future* within this evolving genre. Section III applies eco-critical theory to analyze key themes in the novel, such as climate justice, technological utopianism, and the role of governance. Section IV discusses the narrative structure, stylistic choices, and ethical dilemmas presented in the text. Section V concludes by reflecting on the significance of climate fiction in a time of ecological crisis and its potential to influence both public perception and policy decisions.

In sum, climate change is not merely a scientific or political issue-it is a narrative challenge that demands new ways of thinking, feeling, and imagining. Through the lens of ecocriticism and the medium of cli-fi, *The Ministry for the Future* offers a compelling and hopeful blueprint for navigating the complexities of the climate crisis, reminding us that the stories we tell today will shape the world we live in tomorrow.

Although lots of researches have been done on climate fiction, there is a lack of research that investigates that *The Ministry for the Future* constructs narratives of vulnerability and justice-driven adaptation from an eco-critical perspective. This study examines that Robinson's novel embodies human and ecological vulnerability, scrutinizes adaptation as both an ethical and systemic process, and frames climate fiction as a kind of literary activism. The research underscores the cultural necessity of viewing climate narratives as more than just stories, but as frameworks for rethinking responsibility and resilience in the Anthropocene by tackling this gap.

2. Climate Fiction (Cli-Fi): Context and Relevance

Context and Relevance Cli-fi has become a potent literary genre that bridges scientific warnings and public imagination. Scholars such as Amitav Ghosh and Ursula Heise argue that fiction is uniquely equipped to convey the slow violence of climate change and the human stories embedded within it. By crafting emotionally resonant and future-oriented narratives, cli-fi fosters empathy, critical reflection, and imaginative solutions. Cli-fi's emergence in literary and cultural discourse marks a response to the inadequacies of traditional storytelling in capturing the scale and complexity of climate-related disruptions. It challenges anthropocentric perspectives and reorients narrative attention toward the non-human, the systemic, and the planetary. Works in this genre often explore not only dystopian and apocalyptic futures but also pathways toward resilience, resistance, and adaptation. The Ministry for the Future exemplifies the dual narrative strategy-juxtaposing harrowing depictions of climate disasters with hopeful projections of global cooperation and technological innovation. Robinson's narrative refuses to surrender to despair, instead advocating for systemic transformation. The novel envisions climate policy as an act of global solidarity and emphasizes the moral urgency of intergenerational justice [7, 8].

Moreover, cli-fi resonates with readers by making abstract data personal and experiential. When readers witness climate trauma through the eyes of fictional characters, they engage with climate science in visceral and moral terms. Literature, in this sense, complements empirical research by animating scenarios and galvanizing emotional and ethical awareness. Through the lens of cli-fi, climate change becomes not only a scientific or political issue but a profoundly human one. Robinson's novel stands at the confluence of fiction, science, and policy. It serves as a creative model of participatory futures-proposing carbon coins, geo-engineering, eco-terrorism, and institutional reform as plausible, if controversial, responses. Such narrative experiments are vital in a moment when traditional forms of discourse seem inadequate to the urgency and complexity of climate disruption. Thus, cli-fi, and particularly *The Ministry for the Future*, invites not only reflection but action [9, 10].

3. Theoretical Framework: Vulnerability and Adaptation

This paper employs a critical eco-critical lens and incorporates concepts from climate justice and adaptation theory. Vulnerability is understood as both physical (e.g., exposure to extreme events) and social (e.g., inequitable access to resources). Adaptation refers to the systemic and behavioral changes that communities or institutions must undertake to survive environmental shifts.

In eco-critical discourse, vulnerability is not only framed in terms of susceptibility to environmental hazards but is deeply connected to historical inequalities, colonial legacies, and power asymmetries. As Rob Nixon outlines in his theory of 'slow violence,' environmental destruction is often incremental and invisible, disproportionately affecting marginalized communities and future generations. This recognition of asymmetrical vulnerability is echoed in the works of scholars like Kyle Powys Whyte, who explore Indigenous knowledge systems and resilience strategies as responses to colonial ecological disruption.

From a climate justice perspective, adaptation is not merely a technical or infrastructural adjustment but a socio-political process that involves ethical considerations and redistributive justice. The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as "the process of adjustment to actual or expected climate and its effects." Yet, this definition is expanded in socio-political analyses to emphasize that adaptation must also rectify systemic injustice, resource imbalances, and power structures that exacerbate climate vulnerability.

This framework is particularly relevant when analyzing *The Ministry for the Future*, as Kim Stanley Robinson envisions a future in which climate action requires both institutional reform and grassroots activism. The novel foregrounds the role of international governance, eco-terrorism, technological innovation, and local resistance as adaptive strategies. It portrays adaptation not as a linear process but as a contested terrain involving negotiations, moral dilemmas, and competing interests.

Furthermore, the novel's portrayal of the Ministry as a bureaucratic entity tasked with representing future generations emphasizes intergenerational justice, a core principle of adaptation ethics. It challenges readers to consider what responsibilities the present holds toward unborn generations, especially when the consequences of inaction are irreversible. Robinson's inclusion of diverse perspectives-from climate refugees and scientists to policymakers and revolutionaries-embodies the multifaceted nature of vulnerability and the necessity for pluralistic approaches to adaptation [11, 12, 13].

4. Summary of *The Ministry for the Future*

Set in the near future, the novel begins with a devastating heatwave in India, killing millions. This catalyzes the creation of the titular UN agency-the Ministry for the Future-tasks with representing future generations. Through multiple narrators and perspectives, the story explores geoengineering, eco-terrorism, financial restructuring, refugee crises, and technological innovation. It's a narrative mosaic that asks: what does adaptation really mean, and who gets to survive?

Robinson crafts a sweeping epic that operates both at the micro and macro levels. At the individual level, we follow characters like Frank May, an American aid worker traumatized by the heatwave, and Mary Murphy, the Irish head of the Ministry, who must navigate the complexities of international diplomacy and moral ambiguity. Their stories anchor the novel's philosophical explorations in tangible human experiences, showing how individuals cope with the scale of ecological trauma. On the macro level, the novel interrogates the systemic inertia of global capitalism and the difficulty of enacting meaningful climate policy. Robinson presents a series of speculative yet plausible interventions-from carbon coin economies to rewilding projects, from solar radiation management to central banking reforms. Each chapter adds a layer to the novel's vision of an integrated global response, demonstrating how science, politics, and ethics must converge to confront the climate emergency. What makes *The Ministry for the Future* particularly compelling is its refusal to offer a singular solution. Instead, it posits that meaningful climate adaptation requires a patchwork of strategies-some peaceful and legal, others radical and even violent. Robinson blurs the boundaries between heroism and extremism, hope and

despair, making the reader question conventional notions of progress and morality. The novel also excels in representing the non-human world. Lakes, glaciers, and animals are given narrative voices, reminding us that the biosphere is not merely a backdrop to human drama but an active participant in our shared destiny. These narrative choices reinforce the ecological interdependence at the heart of climate fiction and challenge anthropocentric worldviews.

In essence, *The Ministry for the Future* is not just a warning; it is also a thought experiment. It imagines what a just and sustainable future might look like, not as utopia, but as a difficult, incremental, and collective struggle. It emphasizes that adaptation is not just technical or policy-based—it is also cultural, psychological, and existential [14, 15, 16].

5. Narratives of Vulnerability

The book opens with a visceral depiction of heat-induced mass death in India—a stark reminder of climate injustice. Vulnerability is not equally distributed; it intersects with poverty, race, and geography. Robinson vividly illustrates how marginalized communities bear the brunt of climate catastrophes, particularly those in the Global South. Through characters like Frank May, a traumatized aid worker, and Mary Murphy, the head of the Ministry, Robinson humanizes suffering and resilience. Frank's PTSD and eventual radicalization reflect the psychological toll of witnessing mass suffering, while Mary's bureaucratic struggles highlight the emotional and ethical burden of global leadership under pressure. These characters provide contrasting yet complementary views of how individuals navigate structural violence and ecological breakdown.

Robinson also touches upon gendered dimensions of vulnerability. Women, particularly in rural and underdeveloped regions, face increased exposure to climate impacts due to caregiving responsibilities and limited resource access. The novel occasionally references maternal grief and female resilience, subtly embedding a feminist undertone within its broader critique of environmental injustice. In doing so, Robinson invites readers to consider the uneven burdens climate change imposes on different bodies and communities.

Robinson critiques existing global governance structures, portraying them as sluggish, fragmented, and often beholden to market logics. The United Nations, the IMF, and central banks appear initially paralyzed by inertia, incapable of responding to crises that transcend national borders. However, the Ministry for the Future emerges as a counter-institution—a body created to represent the voiceless: future generations and the biosphere. Initially met with skepticism and resistance, the Ministry gradually becomes a beacon of innovation and hope [17, 18, 19].

Robinson's portrayal of institutional evolution is neither utopian nor purely cynical. The Ministry's internal debates, policy experiments, and moral dilemmas show that adaptation is a learning process. Institutional vulnerability, in this context, becomes a site of possibility. While failures and compromises are inevitable, the novel affirms that governance systems can evolve to meet the demands of the Anthropocene, provided there is moral courage and epistemic openness.

The novel also foregrounds the importance of decentralization and local governance. Regional experiments from autonomous farming cooperatives to local currency systems highlight the resilience of bottom-up

solutions. Robinson positions institutions as both potential barriers and catalysts for systemic change, suggesting that reform must come from both within and outside traditional centers of power.

Scenes detailing biodiversity collapse, glacier melt, and ecosystem shifts underscore the planetary scale of the crisis. Robinson integrates detailed scientific exposition with poetic reflection to emphasize the Earth's fragility. The narrative includes glacier voices and animal perspectives, reminding readers of the deep interconnection between human and non-human life. These elements challenge Anthropocentrism and elevate ecological entities as central agents within the climate narrative.

Robinson's representation of ecological vulnerability is comprehensive. He discusses ocean acidification, habitat loss, species extinction, and climate feedback loops. The book makes clear that ecosystems are not just passive victims of climate change but dynamic systems whose degradation can trigger cascading failures across planetary boundaries. By giving voice to ice, trees, and animals, Robinson constructs a narrative ethics that insists on the moral relevance of the more-than-human world.

Furthermore, the novel critiques the exploitative logic of extractive capitalism that has led to such ecological precarity. From oil rigs to monoculture plantations, the infrastructures of industrial modernity are portrayed as engines of both development and destruction. Robinson's narrative thus links ecological vulnerability with historical injustice, suggesting that environmental degradation is deeply rooted in colonial, capitalist, and technocratic paradigms [20, 21, 22].

6. Technological Solutions Kim Stanley Robinson's *The Ministry for the Future*

The novel presents carbon sequestration, solar geo-engineering, and innovative financial mechanisms such as carbon coin-based incentives as part of a broader climate toolkit. These technologies are not framed as panaceas, but rather as components in an urgent and evolving global strategy. Carbon drawdown initiatives, for instance, attempt to rebalance Earth's atmospheric systems by removing CO₂ directly from the air, echoing real-world research into Direct Air Capture. Meanwhile, the controversial use of solar geo-engineering to artificially lower global temperatures raises deep ethical questions, even as it demonstrates immediate impact. Robinson walks a fine line—celebrating technological ingenuity while critiquing techno-utopianism. Technology in the novel is portrayed as necessary, but never sufficient.

6.2 Grassroots Movements and Eco-Activism While top-down institutional reforms are key to Robinson's vision, the novel strongly emphasizes bottom-up resistance and transformation. Grassroots movements, particularly youth-led protests reminiscent of real-world figures like Greta Thunberg, emerge as catalysts of awareness and action. Robinson doesn't shy away from depicting more radical eco-activism, including sabotage and anonymous attacks on carbon-emitting industries—actions which raise complex moral questions about violence and urgency. These insurgent forms of resistance signify a broader recognition that traditional political channels may be inadequate to meet the crisis. Adaptation, in this sense, becomes a mode of defiance—an insistence on survival and justice in the face of systemic inertia. The novel honors decentralized, community-driven efforts such as rewilding projects, local

food systems, and microgrids as crucial threads in the fabric of climate resilience [23, 24, 25].

Ethical and Philosophical Dimensions At its core, *The Ministry for the Future* is an ethical novel. The text continually engages with philosophical questions about agency, sacrifice, and morality. Who gets to decide what the future should look like? What forms of coercion are acceptable in the name of survival? Robinson's characters grapple with these dilemmas in personal and political contexts. Mary Murphy, for instance, faces pressure to condone controversial programs, balancing utilitarian calculus against human rights concerns. Frank May, scarred by trauma, questions the value of life and the legitimacy of systemic change. Through their arcs, Robinson suggests that adaptation must be rooted in justice, equity, and compassion. Efficiency alone is not enough; survival strategies must reflect diverse human experiences and values. The novel ultimately calls for a planetary ethic-one that recognizes the interconnectedness of all life and the moral imperatives of our time.

7. Literary Techniques and Narrative Strategy

Robinson employs a fragmented narrative structure that oscillates between individual testimonies, philosophical dialogues, and policy-based discourses. This postmodern technique mirrors the complexity and decentralization of the climate crisis itself. Through a collage of voices-ranging from anonymous citizens to artificial intelligences-the novel constructs a polyphonic and inclusive narrative. This multiplicity reflects the dispersed nature of climate impacts and responses, suggesting that there is no singular authority or solution that can comprehensively address the challenge [26, 27, 28].

The use of narrative shifts and genre-blending-incorporating speculative fiction, science writing, and epistolary elements-enhances the immersive quality of the text. Robinson's style disrupts conventional storytelling, compelling the reader to navigate fragmented knowledge much like stakeholders must grapple with fragmented governance in reality [29, 30]. His approach allows for deep dives into climate science, political theory, and economic speculation while maintaining an emotional connection through personal stories. Additionally, the novel's structure mirrors the unfolding of climate events themselves: unpredictable, multifaceted, and interwoven with systems both natural and human. This literary strategy not only reinforces thematic content but also serves as a rhetorical technique, drawing readers into an experiential understanding of climate complexity [31, 32, 33].

8. Implications and Conclusion

The Ministry for the Future transcends its genre boundaries, functioning as both speculative fiction and a policy thought experiment. Robinson's narrative does not merely present a dystopia; rather, it imagines a plausible trajectory of resistance and systemic reform. By centering narratives of vulnerability-be they human, institutional, or ecological-and juxtaposing them with adaptive strategies, the novel enacts a form of literary activism.

This work invites readers to confront the immediacy of climate crisis while also contemplating long-term pathways toward sustainability. It emphasizes that the future is not preordained but constructed through collective action, imagination, and ethical commitment. Fiction, in this

context, becomes a laboratory for empathy and ideation, where speculative scenarios foster real-world reflection.

Moreover, Robinson's insistence on moral deliberation and inclusivity highlights the necessity of justice-driven adaptation. His vision of planetary stewardship is not just technological but deeply humanistic. As such, *The Ministry for the Future* aligns with broader ecocritical aims: to use literature as a catalyst for ecological awareness and transformation. In conclusion, climate fiction like Robinson's plays a vital cultural role. It shapes how societies perceive risks, responsibilities, and possibilities in the Anthropocene. By weaving together the threads of vulnerability, adaptation, and hope, *The Ministry for the Future* offers not just a warning, but a map toward ecological resilience and justice.

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