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CLIMATE CHANGE AS BIOPOLITICAL RUPTURE: SURVEILLANCE, SECURITY AND THE UNEQUAL GOVERNANCE OF LIFE

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Abstract: This paper analyzes climate change through the theoretical lens of biopolitics, emphasizing that the global climate crisis is not only an ecological phenomenon but also a political event that restructures how life is governed, protected, and exposed to risk. Drawing on the work of foundational thinkers such as Foucault, Agamben, Mbembe, Esposito, and others, the paper explores how climate governance operates as a biopolitical apparatus, monitoring, regulating, and stratifying populations based on their perceived value and vulnerability. Using a critical, interpretive methodology grounded in political philosophy and supported by illustrative case studies, the study examines how biopolitical theory enables a deeper understanding of adaptation and resilience strategies, highlighting how such measures often reinforce global inequalities rather than resolve them. Climate-related interventions frequently channel political decision-making into technical solutions, sidelining democratic participation and ethical responsibility. The paper critiques key trends such as necropolitics, eco-fascism, and green colonialism, which reveal how biopolitical climate governance can marginalize and displace vulnerable communities under the guise of sustainability. It also addresses the ethical dilemma of resilience, arguing that adaptive strategies too often place responsibility on individuals while neglecting systemic causes of vulnerability. Finally, the study calls for an emancipatory form of biopolitics, one grounded in solidarity, ecological justice, and care, rather than control. By foregrounding ethical and philosophical critique, the paper argues that confronting the climate crisis requires rethinking how life itself is valued and protected in the Anthropocene.

Keywords: *biopolitics, climate change, ecological security, ecological justice, necropolitics.*
Field: Social Sciences

1. INTRODUCTION

Although biopolitics is often understood as a conceptual framework that places sovereign power at the center of political life (Coleman & Grove, 2009), the term has since been widely adapted to address diverse research contexts. The versatility of the concept grants it significant ontological weight across multiple disciplines. Originally rooted in political philosophy, biopolitics has evolved into a valuable interdisciplinary analytical tool that, despite its broad applications, has retained a coherent core meaning. The term itself, derived from bios (life) and politics, denotes the intersection of biological existence with political and legal systems, thus integrating dimensions of life with structures of governance and sovereignty. It challenges conventional distinctions between "nature" and "culture," echoing the classical Greek dichotomy between physis (nature) and nomos (law) (Losoncz & Takács, 2015).

Contemporary discourse on biopolitics is largely shaped by the work of Michel Foucault (1926–1984), who incorporated the concept into his historical and theoretical analysis of power, not as coercion or legal authority, but as a process of normalization, subjectification, and rationalization of power relations within social life. In doing so, Foucault displaced traditional political frameworks by locating influence and control within the broader matrix of social relations. Central to his analysis is the concept of biopower, which he defined as a set of mechanisms directed at the biological characteristics of human beings, characteristics that, through historical processes, became the focus of political and social strategies (Foucault, 2007).

Foucault identified three principal axes through which biopower operates. The first, the "anatomo-politics of the human body," refers to the disciplining and regulation of individual bodies. The second, "the politics of the population," addresses the management of collective life - focusing on population growth, health, life expectancy, and the social body. In this form, biopolitics does not operate solely on the individual but also targets populations as species groups, enabling the implementation of regulatory strategies across modern societies. The third axis involves knowledge production, which serves as a critical support

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system for biopower. Foucault emphasized the role of disciplines such as demography, political economy, statistics, and medicine in enabling the state to govern populations more effectively (Takács, 2017). These knowledge systems form the infrastructure of biopolitical governance, offering protection against threats to societal well-being, including environmental dangers that could undermine ecological systems vital to prosperity (Cavanagh, 2014).

Together, these pillars constitute a comprehensive biopolitical framework for societal development and targeted social intervention, aiming at the protection and optimization of both individual and collective life. Today, Foucault's historical and conceptual analysis of biopower serves as a foundational approach in diverse fields across the humanities and social sciences. His theories remain relevant to contemporary global governance, particularly in areas concerning human security, public health, and risk management. Increasingly, biopolitical theory also provides critical insight into pressing geopolitical issues such as eco-politics and climate change (Imanaka, 2023).

The climate crisis represents not only a scientific and ecological challenge but also a profound political and philosophical problem. In recent years, both scholars and policymakers have drawn upon biopolitical frameworks to interrogate the governance strategies used to address climate change. As ecological threats become more severe, states, corporations, and international organizations increasingly frame climate change as a matter of survival, expanding the reach of biopolitical interventions into ecological domains.

The biopolitical dimensions of climate change are firmly grounded in Michel Foucault's theoretical concept of biopolitics, which is intrinsically linked to questions of human and population survival. Biopolitics, according to Foucault, operates through what he terms biopower, a dual logic involving both the discipline of individual bodies (anatomo-politics) and the regulation of populations (biopolitics proper). Through these mechanisms, modern states are able to produce "healthy" and "productive" citizens while managing collective threats such as disease, poverty, and environmental degradation.

Expanding on Foucault's framework, Giorgio Agamben (1942–) introduces the concept of bare life (Homo Sacer), denoting a life stripped of political and legal recognition, subject to exclusion and sovereign violence (Agamben, 1998). Agamben reorients the concept of biopower toward sovereignty, arguing that sovereignty is inherently biopolitical. He contends that modern political orders are characterized by the existence of lives that can be killed without legal or moral consequence (Yang, 2018). Bare life, for Agamben, is not a biological given but a product of the sovereign's foundational act of exclusion (Losoncz & Takács, 2015). Within this logic, climate change produces new forms of bare life, notably, climate refugees, whose displacement and vulnerability fall outside the protections of statehood and citizenship.

More recently, Achille Mbembe (1957–) has extended the biopolitical framework through his theory of necropolitics, which explores how power determines who may live and who must die. In the context of climate change, necropolitics is expressed through unequal exposure to environmental risks based on race, class, and geography. Rising sea levels, drought, and toxic pollution disproportionately impact communities with the least political and economic power, exposing the necropolitical dynamics of climate governance (Lucatello & Carrill, 2023).

Italian philosophers Michael Hardt (1960–) and Antonio Negri (1933–2023) also build on Foucault's concept of biopolitics, yet direct it toward new ontological and political possibilities. They emphasize the role of biopolitics not only as a tool of social control but also as a site of potential resistance. For Hardt and Negri, biopolitics intersects with economic production and the management of life through labor, positioning exploitation and liberation as central dynamics of individual and collective life. They contrast biopower, exercised by the sovereign or "Empire", with biopotence, the creative and transformative force of the multitude (Hardt & Negri, 2000).

Roberto Esposito (1950–) offers yet another distinct trajectory within biopolitical thought, focusing on the philosophical roots of community (communitas) and immunity (immunitas). While community implies openness and shared life, immunity denotes protection from obligations or danger. Esposito argues that modern politics increasingly functions through an immunitary logic, defending the social body by drawing boundaries and implementing exclusionary mechanisms. Unlike Foucault's focus on productive power or Agamben's emphasis on sovereign exception, Esposito highlights the paradox of immunization: the need to preserve life by introducing controlled exposure to risk, which can ultimately lead to isolation or self-destruction (Esposito & Hanafi, 2013). In the context of climate change, Esposito's concept of immunization provides a compelling framework for analyzing environmental governance. Contemporary climate policies often reflect an immunological rationale, in which certain populations and territories are fortified against ecological disruption, frequently at the expense of more vulnerable groups. These interventions do not merely seek to neutralize external threats, they often introduce controlled exposure to danger through selective adaptation measures, the securitization of borders against climate migrants,

or technological fixes such as geoengineering. Though framed as protective, these strategies risk exacerbating global inequalities and reinforcing the very systems of exclusion they claim to resolve. In this sense, climate governance mirrors the biopolitical tension Esposito identifies, between the preservation of life and the enactment of mechanisms that undermine the conditions for a shared, sustainable existence (Esposito, 2011).

Other theorists have further expanded the biopolitical paradigm beyond the human subject. Elizabeth Povinelli (1962–) and Bruno Latour (1947–2022) argue that climate governance now operates at the level of planetary politics (Latour) and geontopower (Povinelli). These frameworks challenge anthropocentric assumptions and emphasize the governance of non-human life, geophysical systems, and ecological processes (Povinelli et al., 2017; Latour, 2017). From this perspective, climate change involves not only the regulation of human populations but also the management of ecosystems, atmospheric processes, and planetary boundaries.

Together, these theoretical approaches provide a robust foundation for analyzing climate change as a profoundly biopolitical issue, one in which the governance of life is inseparable from systems of exclusion, control, and ecological survival.

2. MATERIALS AND METHODS

This paper adopts a theoretical and critical methodology, grounded in political philosophy and qualitative discourse analysis. The aim is to interpret climate governance not merely as a set of policy mechanisms, but as a form of power that organizes and regulates life, risk, and survival. In addition to conceptual analysis, selected illustrative case studies are included to demonstrate how abstract biopolitical frameworks materialize in real-world climate interventions. These cases are drawn from secondary sources and serve to ground the theoretical argument in concrete socio-political dynamics. Ultimately, the methodology is interpretive rather than empirical, and its contribution lies in conceptual clarification, critical synthesis, and normative reflection on the ethics and politics of life in the age of climate breakdown.

3. RESULTS AND DISCUSSIONS

Climate change is both an ecological and scientific phenomenon and a deeply political process that intensifies the unequal distribution of life, risk, and vulnerability across the globe. From a biopolitical perspective, climate change functions as an event that compels states and institutions to reconfigure how life is managed, secured, and exposed to harm. As Foucault (2003) argued, such an event is not a discrete occurrence, but rather a transformation in the conditions of governance and the rationalities through which populations are regulated. Climate change is thus framed as a domain where states can demonstrate their capacity to sustain life, though this framing often intersects with securitization discourses and risk management logics. As Oels (2013) notes, this shift marks the “climatization” of security, an emergent biopolitical logic that mobilizes populations to adapt to extreme contingencies.

Key concepts from biopolitical theory, such as visibility, securitization, individual risk, and population control, have become increasingly entwined with environmental governance. Biopolitics is now frequently linked to the management of ecological uncertainty and crisis. It provides a framework for critically analyzing adaptation and resilience techniques, not from a purely technical standpoint, but through their implications for empowering vulnerable populations and enhancing community adaptive capacity. Rather than offering concrete solutions, the biopolitical lens problematizes the ethical and political conditions under which such measures operate. It situates adaptation as an ethical-aesthetic and political issue, rather than a purely technocratic one. Yet, even as biopolitical discourse challenges narrow technical framings, it may still contribute to channeling climate adaptation toward instrumental, security-oriented responses.

Grove (2014) categorizes biopolitical approaches to adaptation into three primary forms. The first, “ordered life,” reflects traditional understandings of adaptation, viewing the socio-ecological system as inherently vulnerable and seeking to restore a prior state of equilibrium. The second, “logistical life,” interprets vulnerability as a precondition and advocates for reconfiguring the flows of people, goods, and information to manage and reduce risk. The third, “resilient life,” focuses on cultivating the ability to endure unknown threats by maintaining the core functions of socio-ecological systems. In this final mode, adaptation does not bridge present and future conditions through long-term planning but instead creates specific forms of life that are flexible, reactive, and optimized for uncertainty. These interventions seek to construct the “resilient subject”- an individual or community capable of adapting to systemic change, often without questioning or altering the broader systems that produce vulnerability in the first place.

Governments and international institutions have responded to the climate crisis with a proliferation

of surveillance, regulatory, and emergency management strategies, many of which operate through biopolitical logics. Predictive climate modeling, health surveillance in disaster zones, and the demographic monitoring of vulnerable populations reflect efforts to measure, anticipate, and govern life at a planetary scale. These technologies are frequently accompanied by securitization narratives that frame climate change as a national or global threat, thereby justifying exceptional governance practices such as militarized borders or restrictions on mobility (Hartmann, 2010).

The governance of climate change is also shaped by profound geographic and racial inequalities. Wealthy countries, equipped with advanced technology and infrastructure, implement protective measures such as seawalls, heat resilience strategies, or climate insurance schemes. Meanwhile, communities in the Global South face increasing exposure to climate-induced disasters with limited institutional support. This disparity reflects a necropolitical logic (Mbembe, 2003; Nixon, 2011), wherein certain populations are deliberately or passively exposed to environmental degradation, slow violence, and premature death.

One of the most visible manifestations of climate change as a biopolitical event is the emergence of climate refugees, individuals displaced by ecological factors who often fall outside the protection of international law. These individuals occupy a liminal zone, wherein their vulnerability is acknowledged but not institutionally addressed (Baldwin, 2012). This condition closely parallels Agamben's (1998) concept of bare life, existence recognized only through its exposure and disposability, lacking political representation or legal protection.

In this light, climate change emerges not only as a scientific or ecological crisis, but as a biopolitical rupture that reorganizes how life is valued, governed, and excluded. It foregrounds the mechanisms by which some lives are safeguarded and enhanced, while others are rendered expendable. The unequal governance of climate change thus reinforces entrenched hierarchies of race, class, and geography, transforming the planet into a stratified field of risk and protection.

Despite the growing theoretical interest in biopolitics and climate change, empirical work remains limited. One relevant domain is the governance of climate-induced migration. As Turhan et al. (2015) illustrate through the case of seasonal workers in Turkey, discourses of adaptation may obscure biopolitical interventions. Although framed in terms of resilience, these policies often aim to ensure the uninterrupted circulation of goods and labor rather than to address the root causes of vulnerability.

3.1 Governance, surveillance and ecological security

In the era of climate change, the governance of life increasingly operates through mechanisms of surveillance and securitization. Climate governance has moved beyond the realm of international treaties and environmental policy frameworks to encompass a complex network of institutions, technologies, and discourses that frame the climate crisis as a matter of national, regional, and even planetary security. This transformation marks a shift from environmental management toward ecological security, a biopolitical strategy that merges environmental risk with the logic of control, reshaping how power is exercised over populations and territories.

Surveillance technologies play a central role in this transition. With the proliferation of satellite imagery, predictive climate models, environmental sensors, and artificial intelligence–driven monitoring systems, states and corporations now possess unprecedented capabilities to quantify, model, and manage environmental variables. While these tools are often promoted as necessary for sustainability and resilience, they also function as biopolitical instruments of control. They identify which populations are considered "at risk," which resources are most valuable, and which regions warrant intervention - or abandonment (Evans & Reid, 2014). The use of big data in environmental monitoring often abstracts vulnerability from its social and political roots, reducing complex realities to manageable risk categories.

A vivid example of this is found in California, where wildfire surveillance systems like ALERTCalifornia, developed by the University of California, San Diego, deploy over 1,150 AI-equipped cameras to monitor fire-prone regions. These systems have detected over 1,200 fires, frequently identifying them faster than human observers and allowing quicker emergency responses (Carlton, 2025). While ostensibly aimed at protecting lives and property, such systems also redefine how rural and forested landscapes are governed. Populations residing in high-risk zones often face exclusionary zoning laws, higher insurance premiums, and displacement, transforming these territories into laboratories for anticipatory governance and spatial immunization.

The language of climate security increasingly legitimizes exceptional governance measures, including military deployments, border militarization, and the policing of resource conflicts. As climate change is framed as a "threat multiplier" in defense and geopolitical strategies, it becomes the basis for anticipatory governance, actions taken based not on immediate crises but on modeled futures (Dalby, 2009). This

reflects Foucault's insight that modern power operates by managing life under conditions of uncertainty.

For example, the U.S. Department of Defense has formally recognized climate change as a national security threat, incorporating climate projections into its long-term strategic planning. This includes climate-proofing military infrastructure, modeling scenarios for geopolitical instability, and assessing transboundary threats such as migration and resource scarcity (Bucknam, 2023). Such policies extend the reach of military power into environmental and humanitarian domains, effectively rendering entire regions and populations governable under the rubric of defense.

However, these ecological security strategies are applied unevenly and often reinforce global hierarchies of power, race, and capital. Climate adaptation funds, for instance, are disproportionately directed toward wealthier nations and private-sector projects. In contrast, communities in the Global South are frequently subjected to top-down interventions, such as forced relocation or land-use restrictions, with little opportunity for democratic participation (Bettini, 2013). These dynamics are evident in the case of planned relocations in Fiji, where rising sea levels have displaced coastal communities. Although presented by the Fijian government and international donors as proactive climate adaptation, the affected populations often experience disempowerment, losing ancestral lands and having minimal involvement in relocation decisions (McMichael & Powell, 2021). This reveals an ethical tension in resilience policies, where survival is achieved through displacement, rather than structural justice.

Similarly, ecological security regimes frequently blur the boundaries between environmental protection and economic extraction. Large-scale green infrastructure, renewable energy projects, and conservation programs—often justified in terms of sustainability, can displace Indigenous communities or privatize ecological commons. Scholars describe this as green extractivism: a biopolitical logic in which the environment becomes both a site of governance and a resource to be exploited (Fairhead, Leach, & Scoones, 2012).

Thus, governance in the age of climate change is deeply biopolitical: it surveils, predicts, secures, and disciplines both life and territory. Rather than addressing the structural causes of ecological degradation, these strategies often re-inscribe existing inequalities under the guise of environmental protection and resilience.

3.2 Critiques and ethical considerations

As climate governance increasingly adopts biopolitical logics, characterized by surveillance, security, and the management of life, it has come under growing ethical and political scrutiny. While these strategies often claim to protect life and ensure resilience, they frequently do so by reinforcing existing inequalities, sacrificing certain lives, or rendering others less valuable. This section explores several major critiques of biopolitical climate governance, drawing on frameworks such as necropolitics, eco-fascism, and green colonialism, and reflects on the possibility of alternative, emancipatory approaches.

Table 1. Major Biopolitical Critiques of Climate Governance

Framework	Core Concept	Mechanism of Power	Implication for Climate Governance	Illustrative Example
Necropolitics	Power over life and death	Sovereign exclusion	Abandonment of vulnerable populations	Desertification in the Sahel; urban heat deaths
Eco-fascism	Ecological purity as exclusion	Ethno-national securitization	Militarized borders; anti-migrant climate narratives	US/Mexico and EU border securitization
Green colonialism	Environmentalism as neocolonial control	Neoliberal appropriation	Displacement through conservation or carbon offset schemes	REDD+ land grabs; Indigenous displacement
Resilience critique	Individualized burden of adaptation	Depoliticization of structural risk	Adaptation without reform; burden placed on communities	Fiji village relocations; informal settlement upgrades

Source: Synthesized from Mbembe (2003), Yusoff (2018), Evans & Reid (2014), Conversi (2024), McMichael & Powell (2021).

Necropolitics and the Unequal Valuation of Life – Achille Mbembe's theory of necropolitics offers a compelling extension of the biopolitical critique by highlighting how power determines "who may live and who must die" (Mbembe, 2003). In the context of climate change, this logic becomes visible in the abandonment of vulnerable populations, the prioritization of economic assets over human lives, and the

differential exposure to environmental hazards. From heat-related deaths in urban slums to the slow violence of drought and desertification in regions like the Sahel, large groups of people are left to perish, not as a failure of governance, but as a function of it. Climate abandonment thus becomes a feature of power in the Anthropocene.

Eco-Fascism and Exclusive Climate Politics – A second danger arises in the form of eco-fascist ideologies, which equate ecological preservation with ethnic or national purity. These ideologies frame environmental degradation as the result of overpopulation or migration, offering authoritarian solutions such as militarized borders, forced sterilization, or the expropriation of land. Under the guise of ecological protection, eco-fascism promotes regressive policies that reinforce racial and ethnic hierarchies, treating some lives as expendable for the sake of a supposedly "balanced" ecosystem (Conversi, 2024). This trend underscores the risks of climate governance that lacks a firm ethical commitment to justice, inclusion, and the protection of all life.

Green Colonialism and Global Inequality – Climate interventions have also been widely critiqued for reproducing colonial structures of appropriation and control, now reframed in the language of sustainability. This phenomenon, known as green colonialism, involves the appropriation of land for conservation zones, renewable energy projects, or carbon offset schemes, often displacing Indigenous peoples and local communities (Yusoff, 2018). In this context, the Global South is simultaneously blamed for environmental degradation and positioned as a testing ground for solutions to problems largely created by industrialized nations. The result is a paradoxical relationship of dependency, extraction, and exclusion under the banner of climate action.

The Ethical Dilemma of Resilience – Resilience, a central concept in contemporary climate discourse, also warrants critical examination. While often presented as an empowering ideal, resilience can shift the burden of adaptation onto individuals and communities, leaving underlying structural causes of vulnerability unaddressed. Critics argue that this framing naturalizes inequality by emphasizing flexibility and self-reliance over systemic change or the guarantee of rights (Evans & Reid, 2014). As a biopolitical strategy, resilience frequently justifies minimal intervention, accepts harm as inevitable, and displaces responsibility from institutions onto those who are already most at risk.

Emancipatory Biopolitics – Despite these critiques, scholars have also called for more emancipatory forms of biopolitics, frameworks that acknowledge the interdependence of human and non-human life, and that aim for the equitable distribution of care, protection, and environmental responsibility. These approaches are grounded in principles of ecological justice, solidarity, and participatory governance. Rather than reproducing logics of exclusion and control, they seek to reimagine climate governance in ways that affirm the plurality of life and foster a shared sense of planetary belonging.

4. CONCLUSION

Viewing the climate crisis through the lens of biopolitics reveals that it is not merely an ecological emergency, but a fundamental transformation in how life is governed, valued, and rendered vulnerable. This paper has shown that climate governance is increasingly shaped by biopolitical mechanisms - surveillance, securitization, displacement, and population management - that determine which lives are protected, which are abandoned, and which are exposed to systemic harm. The emergence of categories such as "climate refugees," the militarization of borders, and the privatization of ecological resources illustrate how deeply embedded biopolitical logics have become in environmental policy.

While often presented as technocratic or neutral solutions, biopolitical interventions in climate governance frequently reinforce existing hierarchies of power, race, and capital. The critiques explored, from necropolitics to eco-fascism and green colonialism, make clear that these are not marginal anomalies, but structural features of a climate politics that has failed to center justice and planetary care.

Nevertheless, this trajectory is not inevitable. Recognizing the biopolitical nature of climate governance allows us to pose more transformative questions: Who benefits from current climate strategies? Who is excluded? What forms of life do we seek to protect, and at what cost? Answering these questions requires a shift from resilience as mere survival to a vision of climate justice rooted in solidarity, equity, and shared responsibility. Ultimately, the challenge of climate change is not only technical or ecological, it is profoundly philosophical and political. It calls for rethinking the very principles by which life is governed in the Anthropocene.

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