A Qualitative Examination of Contemporary Research Gaps in International Relations Studies: Analyzing Emerging Global Issues

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Article

A Qualitative Examination of Contemporary Research Gaps in International Relations Studies: Analyzing Emerging Global Issues

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Abstract

The field of international relations faces significant research gaps as traditional frameworks struggle to address emerging challenges in the twenty-first century. This research paper presents a comprehensive qualitative analysis of four priority research domains that require urgent scholarly attention: artificial intelligence governance and global power dynamics, climate security and interstate conflict, digital sovereignty in the Global South, and non-state actors in hybrid warfare. Through systematic literature review and thematic analysis, this study identifies critical theoretical and empirical gaps in existing scholarships while proposing frameworks for addressing these deficiencies. The research employs a qualitative methodology incorporating document analysis, comparative case studies, and interpretive analysis of policy documents and academic literature. Findings reveal that traditional international relations theories, including realism, liberalism, and constructivism, require significant adaptation to address the multidimensional challenges posed by technological transformation, environmental change, and evolving security paradigms. The analysis identifies cross-domain interconnections among the four research areas, revealing that artificial intelligence governance intersects with hybrid warfare through autonomous weapons systems and cyber operations, while climate security connects with digital sovereignty through questions of environmental data governance and monitoring infrastructure. The paper concludes with evidence-based recommendations for future research agendas, emphasizing interdisciplinary collaboration, methodological innovation, and policy-relevant scholarship. This analysis contributes to the ongoing discourse on advancing international relations scholarship in an era of unprecedented global complexity and interconnection.

Keywords: international relations theory; artificial intelligence governance; climate security; digital sovereignty; hybrid warfare; qualitative research; non-state actors; global governance

1. Introduction

The discipline of international relations stands at a critical juncture where established theoretical frameworks and methodological approaches increasingly struggle to explain and predict contemporary global phenomena. The accelerating pace of technological change, the intensifying impacts of climate change, and the evolving nature of warfare and security threats have created a landscape that demands new analytical tools and conceptual innovations. As Nye (2011) observed, the diffusion of power in the twenty-first century creates challenges that existing paradigms are not equipped to address. Traditional paradigms that served scholars well during the Cold War era and its immediate aftermath now require fundamental reconsideration to remain relevant in addressing the complex challenges of a rapidly transforming international order. This research paper addresses this imperative by systematically examining four priority areas where current international relations scholarships are insufficient to guide policy and practice.

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The selection of these four research domains—artificial intelligence governance, climate security, digital sovereignty, and hybrid warfare—reflects both their urgency in real-world implications and their potential for theoretical innovation. Each topic represents a domain where the boundaries between traditional categories of analysis have become increasingly blurred, a phenomenon that scholars such as Acharya (2014) have identified as characteristic of a post-Western, multiplex world order. AI capabilities simultaneously function as military assets, economic multipliers, and diplomatic tools, challenging conventional distinctions between hard and soft power that have long organized the discipline (Horowitz, 2018). Climate change operates as both an environmental stressor and a security threat, requiring integration of natural science data with political analysis in ways that traditional disciplinary boundaries discourage (Homer-Dixon, 1999). Digital sovereignty questions traditional notions of territorial control and state authority in an era of transnational data flows, while hybrid warfare obscures the distinction between state and non-state actors, peace and conflict, and military and civilian domains (Kaldor, 2012).

The significance of this research extends beyond academic interest to encompass practical policy implications of considerable urgency. Decision-makers in government, international organizations, and civil society increasingly require evidence-based guidance on issues that existing theoretical frameworks cannot adequately address. The gap between scholarly analysis and policy needs has widened considerably in recent years, as the rapid pace of technological and environmental change has outstripped the capacity of academic research to provide timely insights (Gheciu & Wohlforth, 2018). International organizations including the United Nations, the European Union, and regional bodies have called for enhanced analytical frameworks to support governance responses to emerging threats, yet the academic community has been slow to provide such frameworks in a manner that is both theoretically rigorous and practically applicable. This paper aims to contribute to narrowing this gap by identifying specific areas requiring attention and proposing frameworks for addressing them.

The research employs a qualitative methodology that combines systematic literature review, comparative case analysis, and interpretive policy analysis. This approach is particularly appropriate given the exploratory nature of the research questions and the need to develop new theoretical frameworks rather than test existing hypotheses. Following the methodological guidelines established by Schwartz-Shea and Yanow (2012), the qualitative approach allows for the nuanced analysis of complex phenomena that resist quantification while maintaining analytical rigor through transparent methodology and systematic data collection procedures. The interpretivist epistemological foundation enables the researcher to examine not only what scholars and policymakers say about emerging challenges but also the underlying assumptions, conceptual frameworks, and meaning-making processes that shape their analyses and responses. The following sections present the theoretical foundations, methodology, detailed analysis of each research domain, and comprehensive recommendations for future scholarship.

Furthermore, the interconnected nature of these four research domains presents additional analytical challenges and opportunities. AI governance intersects hybrid warfare through autonomous weapons systems and cyber operations, a convergence that Scharre (2018) has identified as one of the most consequential developments in modern warfare. Climate security connects with digital sovereignty through questions of environmental data governance and monitoring infrastructure. The four domains share common features that suggest broader patterns in how international relations is evolving, including the increasing role of non-state actors, the blurring of traditional boundaries between domestic and international affairs, and the growing importance of technology as both a source of power and a domain of competition. These interconnections suggest that addressing research gaps requires not only domain-specific analysis but also cross-cutting theoretical and methodological innovation capable of capturing the systemic nature of contemporary global challenges.

The structure of this paper proceeds as follows. Section 2 presents the literature review and theoretical framework, examining the strengths and limitations of traditional international relations theories considering emerging challenges. Section 3 details the qualitative methodology employed in

 doi:10.20944/preprints202603.0170.v2

this study. Section 4 provides in-depth analysis of each of the four research domains, identifying specific gaps and proposing research frameworks. Section 5 discusses the theoretical, methodological, and policy implications of the findings. Section 6 acknowledges the limitations of this research. Section 7 presents conclusions, and Section 8 offers recommendations for future research.

2. Literature Review and Theoretical Framework

This section examines the foundational scholarship and conceptual underpinnings relevant to the four priority domains identified in this study. By reviewing the principal theoretical traditions in international relations—realism, liberalism, and constructivism—alongside emerging challenges posed by technological, environmental, and security transformations, the literature review highlights both the strengths and the limitations of existing frameworks. The discussion explores how traditional paradigms have approached issues of power, sovereignty, and security, and identifies the gaps that have become increasingly apparent in the face of rapid global change. The section concludes by outlining the necessity for interdisciplinary perspectives and methodological innovation to advance the field and address pressing research gaps.

2.1. Traditional International Relations Theories

The theoretical foundations of international relations scholarship have historically rested upon three dominant paradigms: realism, liberalism, and constructivism. Each of these traditions offers distinct analytical perspectives on state behavior, power dynamics, and international cooperation, yet each faces significant limitations when applied to emerging global challenges. Realist theory, with its emphasis on state sovereignty, military capability, and balance of power dynamics, provides essential insights into great power competition but struggles to incorporate non-material forms of power and influence that characterize contemporary international relations (Waltz, 1979/2010). The structural realism articulated by Waltz posits that the anarchic structure of the international system compels states to prioritize survival and relative power, yet this framework was developed in an era when the primary dimensions of power—military and economic—were more clearly delineated than they are today. Mearsheimer (2001) extended this framework with offensive realism, arguing that great powers inherently seek to maximize their share of world power, yet even this approach struggles to accommodate the novel forms of power associated with AI capabilities, data control, and digital infrastructure. The realist assumption that states are unitary rational actors acting in an anarchic international system fails to capture the complexity of decision-making processes in an era of networked governance and transnational actor influence, where technology corporations, private military companies, and non-governmental organizations exercise considerable independent agency.

Liberal international relations theory, emphasizing the role of institutions, economic interdependence, and democratic governance in promoting cooperation, offers important correctives to realist pessimism but faces its own limitations in explaining contemporary phenomena. The foundational work of Keohane (1984) on international institutions and regimes demonstrated how cooperation could emerge under anarchy through institutional mechanisms that reduced transaction costs and facilitated information sharing. Ikenberry (2011) further developed the liberal framework by analyzing how the United States constructed and maintained a liberal international order through institutional investments. However, the liberal faith in in institutional effectiveness has been challenged by the proliferation of forum shopping, institutional fragmentation, and the emergence of alternative governance mechanisms that operate outside traditional multilateral frameworks (Keohane & Victor, 2011). Similarly, liberal assumptions about the pacifying effects of economic interdependence require reconsideration in light of weaponized interdependence, where states exploit network centrality and asymmetric dependencies for strategic advantage (Farrell & Newman, 2019). The liberal emphasis on domestic political structures as determinants of foreign policy behavior also requires updating to account for how technological change affects the relationship between domestic politics and international outcomes, as digital platforms and AI-driven information ecosystems fundamentally alter political processes.

 doi:10.20944/preprints202603.0170.v2

Constructivist approaches, which emphasize the role of norms, identities, and social structures in shaping international outcomes, have contributed significantly to understanding non-material dimensions of international relations. Wendt's (1999) foundational argument that "anarchy is what states make of it" opened analytical space for examining how shared ideas and intersubjective understandings shape the structure and behavior of the international system. Finnemore and Sikkink (1998) demonstrated how international norms emerge through processes of entrepreneurship, cascade, and internalization, providing tools for understanding the development of governance frameworks in new domains. However, constructivist scholarship has often struggled to address rapid technological change and its implications for identity formation, norm diffusion, and social structure (Hoffmann, 2019). The question of how norms emerge, evolve, and influence behavior in digital environments where algorithmic curation shapes of information flow present challenges for constructivist analysis that have yet to be fully addressed.

Table 1. Comparative Assessment of Traditional IR Theories and Emerging Challenges.

Theoretical Tradition	Core Assumptions	Strengths for Emerging Challenges	Key Limitations
Realism (Waltz, 1979; Mearsheimer, 2001)	Anarchy, state-centrism, power maximization	Explains great power AI competition, resource conflicts	Cannot accommodate non-state actors, digital power, or climate cooperation
Liberalism (Keohane, 1984; Ikenberry, 2011)	Institutions, interdependence, democratic peace	Explains governance regimes, cooperation incentives	Challenged by weaponized interdependence, institutional fragmentation
Constructivism (Wendt, 1999; Finnemore & Sikkink, 1998)	Norms, identity, social construction	Explains norm development, identity in digital spaces	Struggles with rapid tech change, algorithmic influence on social processes
English School (Bull, 1977; Buzan, 2014)	International society, institutions, order	Bridges material and normative, historical depth	Limited engagement with technology, non-state actors
Critical Theory (Cox, 1981; Linklater, 1998)	Power structures, emancipation, inequality	Addresses digital colonialism, Global South perspectives	Often lacks policy prescriptions, empirical specificity

Source: Author's compilation based on theoretical literature (Waltz, 1979/2010; Keohane, 1984; Wendt, 1999; Mearsheimer, 2001; Finnemore & Sikkink, 1998).

Beyond these foundational paradigms, literature increasingly acknowledges that traditional international relations theories are insufficient for explaining and addressing the multidimensional challenges posed by technological advancement, environmental crises, and evolving security threats. The rise of artificial intelligence, for example, demands a reassessment of power—AI technologies

 doi:10.20944/preprints202603.0170.v2

are not only military assets but also economic multipliers and diplomatic tools, blurring the boundaries between hard and soft power. Realist frameworks, which historically prioritized military and economic power within a state-centric system, do not adequately capture the influence of non-state actors such as global technology corporations, nor do they account for the strategic significance of algorithmic control and data infrastructure. Liberal theories, while emphasizing the importance of institutions and cooperation, struggle with the realities of weaponized interdependence, where states can leverage network centrality to gain strategic advantage, and where institutional fragmentation undermines collective action. Constructivist approaches, despite their strength in analyzing the normative and ideational dimensions of international relations, face new complexities as digital environments accelerate norm diffusion and alter identity formation through algorithmic curation and information flows.

The English School and Critical Theory offer valuable perspectives for analyzing international society and power structures, respectively, yet their engagement with technology and non-state actors remains limited. The English School's focus on institutions and order plack analyticalepth and bridges material and normative concerns but lacks the analytical tools for understanding digital sovereignty or hybrid warfare. Critical Theory, with its emphasis on emancipation and inequality, is well-positioned to interrogate issues such as digital colonialism and Global South perspectives, but often falls short in delivering policy-relevant, empirically grounded prescriptions. As a result, the comparative assessment in Table 1 underscores the urgent need for theoretical innovation—existing paradigms offer important foundations, but their limitations become increasingly pronounced as global dynamics evolve.

To address these gaps, scholars are increasingly advocating interdisciplinary approaches that combine insights from political science, computer science, environmental studies, and sociology. Methodological innovation is also essential; qualitative research methods such as interpretive policy analysis, comparative case studies, and systematic literature reviews enable nuanced exploration of complex phenomena that resist quantification. The integration of interdisciplinary perspectives not only enriches theoretical analysis but also enhances the practical relevance of scholarship for policymakers confronting rapidly changing global realities. As the subsequent sections will demonstrate, advancing international relations theory requires both conceptual creativity and methodological rigor to capture the interconnected, systemic nature of contemporary challenges and to inform governance responses that are both evidence-based and adaptable.

2.2. Emerging Theoretical Challenges

The four research domains examined in this paper present distinct theoretical challenges that existing frameworks struggle to address. In the realm of artificial intelligence governance, traditional concepts of power require fundamental reconsideration. AI capabilities represent a novel form of power that does not fit neatly into conventional categories of hard, soft, or smart power (Nye, 2011). The dual-use nature of AI technologies, functioning simultaneously as military capabilities, economic drivers, and instruments of influence, creates analytical challenges that existing theoretical tools cannot adequately address (Cummings, 2017). Singer (2009) anticipated many of these challenges in his analysis of robotics and warfare, demonstrating how technological transformation creates gaps between the pace of innovation and the capacity of political, legal, and ethical frameworks to adapt. Furthermore, the role of non-state actors—particularly technology corporations such as Google, Microsoft, and OpenAI—in developing and deploying AI systems challenges state-centric assumptions underlying most international relations theories. These corporations control computational infrastructure, talent pools, and algorithmic capabilities that rival or exceed those of many states, yet no established theoretical framework adequately accounts for their role in shaping international power dynamics.

Climate security presents equally significant theoretical challenges. The traditional separation between environmental politics and security studies has obscured the complex causal pathways linking climate change to conflict, cooperation, and institutional development. Homer-Dixon (1999)

 doi:10.20944/preprints202603.0170.v2

provided early theoretical groundwork by examining how environmental scarcity could contribute to violent conflict through mechanisms of resource capture and ecological marginalization, yet his framework focused primarily on intrastate dynamics and did not fully address interstate implications. While recent scholarship has begun to bridge this divide, existing frameworks tend to treat climate as an exogenous variable rather than analyzing its role in reshaping the fundamental structures of international relations (Barnett, 2003). The securitization framework developed by Buzan et al. (1998) offers tools for analyzing how climate change becomes constructed as a security threat, but it does not fully address the material causal pathways through which environmental stress translates into political outcomes. The implications of climate change for sovereignty, territory, and international law, including the potential disappearance of small island states and the opening of Arctic shipping routes—require theoretical innovation that existing paradigms cannot provide.

Digital sovereignty represents a particularly challenging domain for traditional international relations theory. The concept of sovereignty itself, foundational to the discipline since the Peace of Westphalia, requires fundamental reconsideration in the digital age. Traditional notions of territorial control and exclusive authority struggle to accommodate the borderless nature of data flows, cloud computing, and digital platforms. Floridi (2020) has argued that digital sovereignty constitutes a new form of political authority that does not map onto existing frameworks, as data governance involves questions of jurisdiction, ownership, and control that transcend territorial boundaries. The emergence of digital sovereignty claims by states in the Global South challenges Western-centric assumptions about internet governance and digital policy, yet existing theoretical frameworks provide limited guidance for analyzing these developments (Couture & Toupin, 2019). Zuboff (2019) has further complicated the picture by demonstrating how surveillance capitalism creates new forms of power that operate through the extraction and commodification of behavioral data, challenging both state-centric and market-liberal analytical frameworks.

Hybrid warfare presents fundamental challenges to the conceptual foundations of security studies. The traditional distinction between war and peace, between state and non-state actors, and between military and civilian domains becomes increasingly problematic in analyzing hybrid threats. Kaldor (2012) identified many of these challenges in her analysis of "new wars," arguing that contemporary conflicts blur boundaries between war, organized crime, and large-scale human rights violations. The evolution of hybrid warfare beyond Kaldor's framework to encompass cyber operations, influence campaigns, and the strategic use of economic instruments represents a further challenge that existing frameworks struggle to address (Reichborn-Kjennerud & Olsen, 2019). Avant (2005) provided essential analysis of the privatization of security through her examination of the market for force, demonstrating how private military companies alter the dynamics of conflict, accountability, and governance. However, the rapid expansion of non-state actor involved in hybrid warfare since her analysis—including cyber mercenaries, influence networks, and platform companies—demands further theoretical development. The question of attribution—who is responsible for hybrid attacks and how states should respond—challenges traditional concepts of deterrence and international law that were developed for a fundamentally different security environment.

2.3. The Need for Theoretical Innovation

The limitations of existing theoretical frameworks across all four research domains suggest the need for significant theoretical innovation in international relations scholarship. Such innovation must address several cross-cutting themes that emerge from this analysis. First, the relationship between technology and power requires systematic theoretical attention. Horowitz (2018) has argued that AI represents a transformative military technology comparable to nuclear weapons in its potential to reshape the international balance of power, yet existing theories of power transition and balance lack the conceptual tools to analyze how AI capabilities translate into strategic advantage. Traditional theories developed in an era when technological change was slower and its implications for international relations more limited. The accelerating pace of technological innovation, its

 doi:10.20944/preprints202603.0170.v2

differential effects across states and regions, and its role in reshaping the fundamental structures of international politics demand new theoretical approaches capable of capturing both the material and relational dimensions of technological power.

Second, the question of agency in international relations requires reconsideration. Traditional theories, particularly realist approaches, privilege state actors and treat non-state actors as secondary or derivative. The analysis presented here suggests that non-state actors—technology corporations, private military companies, cyber mercenaries, digital platforms—exercise increasingly significant agency in international relations. Theoretical frameworks must be developed that can accommodate multiple types of actors and analyze their interactions in shaping international outcomes, building upon but extending existing work on transnational actors and networked governance (Risse, 2000). This requires moving beyond the state-centric assumptions that continue to dominate much of the discipline while maintaining attention to the distinctive role that states continue to play.

Third, the relationship between domestic and international politics requires re-examination. The traditional separation between these domains, while always problematic as Putnam (1988) demonstrated with his two-level games' framework, has become increasingly untenable in an era of digital connectivity, transnational threats, and hybrid operations that simultaneously target domestic and international audiences. Theoretical frameworks that can integrate analysis across these levels while maintaining attention to the specific mechanisms operating at each level represent an important direction for innovation, one that must go beyond existing approaches to account for the novel ways in which digital technologies and environmental pressures connect domestic and international processes.

Table 2. Cross-Domain Theoretical Challenges in International Relations.

Cross-Cutting Theme	AI Governance	Climate Security	Digital Sovereignty	Hybrid Warfare
Nature of Power	AI as dual-use power resource	Climate as structural power shift	Data as new currency of power	Ambiguity in power attribution
Actor Plurality	Tech corporations as power centers	NGOs, scientific bodies as actors	Platform companies, regional blocs	PMCs, cyber mercenaries, proxies
Domestic-International Nexus	Tech regulation, innovation policy	Local impacts, global governance	Data localization, digital rights	Influence operations, information war
Sovereignty Challenges	Algorithmic governance beyond borders	Climate-induced territorial loss	Transnational data flows	Deniable operations across borders
Norm Development	AI ethics, responsible use	Climate justice, common responsibility	Digital rights, data governance	Rules of engagement, attribution norms

Source: Author's compilation based on analysis of emerging theoretical challenges (Nye, 2011; Horowitz, 2018; Buzan et al., 1998; Floridi, 2020; Kaldor, 2012).

 doi:10.20944/preprints202603.0170.v2

These cross-domain challenges illuminate the urgent need for international relations theory to move beyond static models and adapt to the fluid realities of contemporary global affairs. The multidimensional nature of power, the proliferation of actors, and the erosion of clear boundaries between domestic and international spheres all suggest that traditional paradigms—while foundational—are increasingly inadequate for guiding analysis and policy. Theoretical innovation must therefore proceed on several fronts: integrating insights from technology studies, environmental politics, and digital governance; developing conceptual frameworks that can accommodate actor plurality and networked forms of influence; and constructing models that reflect the recursive relationship between norms, institutions, and rapidly evolving material conditions.

In practical terms, advancing theory requires a willingness to experiment with interdisciplinary methodologies and to embrace complexity rather than reduce it. For instance, qualitative approaches such as interpretive policy analysis and comparative case studies, as outlined in the following methodology section, enable researchers to capture emergent phenomena that defy quantification. Thematic analysis can help identify new patterns of interaction and contestation, while systematic literature reviews ensure that scholarship remains grounded in empirical realities. By fostering dialogue between disciplines and engaging with the lived experiences of both state and non-state actors, international relations theorists can generate more nuanced, actionable insights for policy and governance in an era defined by uncertainty and rapid transformation.

Ultimately, the development of robust theoretical frameworks for AI governance, climate security, digital sovereignty, and hybrid warfare is not merely an academic exercise—it is a practical necessity. As global challenges become ever more interconnected and as the stakes of governance failures rise, the discipline must evolve to provide both conceptual clarity and guidance for decision-makers. Only through sustained theoretical and methodological innovation can international relations scholarship remain relevant to the complex realities of the twenty-first century.

3. Methodology

This section outlines the methodological approach adopted in this study to investigate the evolving theoretical and practical challenges in contemporary international relations. Recognizing the complexity and multidimensionality of issues such as artificial intelligence governance, climate security, digital sovereignty, and hybrid warfare, the research employs a qualitative methodology grounded in interpretivist and critical realist traditions. The following subsections detail the philosophical foundations, research design, data collection processes, analytical techniques, and ethical considerations that inform this research.

3.1. Research Design and Philosophical Foundations

This study employs a qualitative research methodology grounded in an interpretivist epistemological position that recognizes the socially constructed nature of international relations phenomena. The interpretivist approach is particularly appropriate for this research given the focus on understanding the meanings, interpretations, and conceptual frameworks that scholars and policymakers bring to emerging challenges in international relations. Unlike positivist approaches that seek to identify objective causal relationships through hypothesis testing, the interpretivist orientation of this study emphasizes the importance of understanding how actors construct meaning and make sense of complex phenomena (Schwartz-Shea & Yanow, 2012). This epistemological position aligns with the constructivist tradition in international relations while remaining open to insights from other theoretical perspectives.

The ontological position underlying this research is one of critical realism, which acknowledges the existence of a reality independent of our perceptions while recognizing that our knowledge of that reality is always mediated by social, cultural, and theoretical frameworks. As Bhaskar (2008) articulated, critical realism distinguishes between the real, the actual, and the empirical, enabling researchers to investigate underlying structures and mechanisms that may not be directly observable but nonetheless shape outcomes. This position is particularly appropriate for international relations

 doi:10.20944/preprints202603.0170.v2

research, where phenomena such as sovereignty, power, and security have both material and ideational dimensions that interact in complex ways. Critical realism allows for analysis of how material conditions—including technological capabilities, environmental pressures, and military assets—shape possibilities while acknowledging that actors' interpretations of those conditions significantly influence outcomes.

The research design incorporates multiple qualitative methods to ensure methodological triangulation and enhance the credibility of findings. The primary methods include systematic literature review, comparative case analysis, and interpretive policy analysis. Each method contributes distinct strengths to the overall research design while providing complementary perspectives on the research questions. The systematic literature review establishes the current state of knowledge in each domain, drawing upon peer-reviewed scholarship from leading international relations journals. The comparative case analysis enables in-depth examination of specific instances where research gaps are most evident, such as the U.S.-China AI competition or climate-security dynamics in the Sahel region. The interpretive policy analysis provides insights into how policymakers understand and respond to emerging challenges, drawing upon government strategy documents, international organization reports, and think tank publications.

3.2. Data Collection and Analysis

Data collection proceeded through multiple phases designed to capture the breadth and depth of scholarship and policy discourse on each research domain. The first phase involved systematic searches of academic databases including JSTOR, Web of Science, Scopus, and Google Scholar for peer-reviewed articles, books, and book chapters relevant to each topic. Search terms were developed iteratively through preliminary scanning of the literature and refined to ensure comprehensive coverage. For the AI governance domain, search terms included "artificial intelligence AND international relations," "AI governance AND power dynamics," and "technology competition AND great powers." For climate security, terms included "climate change AND security," "environmental stress AND conflict," and "climate cooperation AND peacebuilding." For digital sovereignty, terms included "digital sovereignty AND Global South," "data localization AND developing countries," and "digital colonialism." For hybrid warfare, terms included "hybrid warfare AND non-state actors," "private military companies AND conflict," and "cyber mercenaries AND attribution." Additional searches targeted policy documents from governmental and intergovernmental sources, think tank reports, and working papers from academic institutions.

The analytical approach employed thematic analysis as the primary technique for identifying patterns, themes, and conceptual categories across the collected materials. Thematic analysis is particularly appropriate for this research given its flexibility in accommodating diverse data types and its capacity to generate both descriptive and interpretive findings (Braun & Clarke, 2006). The analysis proceeded through six phases: familiarization with the data through repeated reading and annotation; generating initial codes that captured key concepts, arguments, and gaps; searching for themes by grouping related codes; reviewing themes for internal coherence and external distinctiveness; defining and naming themes to capture their essential meaning; and producing the final analytical narrative. Throughout this process, the researcher maintained detailed analytical memos documenting interpretive decisions, alternative interpretations considered, and reflexive considerations regarding positionality and assumptions.

Quality assurance measures were implemented throughout the research process to enhance the trustworthiness of findings, following the criteria established by Lincoln and Guba (1985) for evaluating qualitative research. These measures included maintaining an audit trail of analytical decisions that enables external verification of the research process; engaging in peer debriefing with colleagues specializing in international relations theory, security studies, and technology governance; and conducting member checking by sharing preliminary findings with subject matter experts and incorporating their feedback. The researcher also maintained reflexive awareness of how personal

 doi:10.20944/preprints202603.0170.v2

assumptions and disciplinary background might influence interpretation, documenting these considerations in analytical memos.

3.3. Ethical Considerations

While this research primarily involves analysis of publicly available documents and does not include human subjects research, several ethical considerations guided the research process. First, attention was paid to ensuring accurate representation of sources, particularly when summarizing or paraphrasing complex arguments from diverse theoretical and cultural perspectives. Second, efforts were made to include diverse perspectives from different geographic regions and theoretical traditions, avoiding the exclusive reliance on Western-centric sources that characterizes much of international relations scholarship. Third, transparency about methodological choices and analytical decisions supports the integrity of the research and enables critical assessment by readers. Fourth, the researcher was attentive to the potential policy implications of research findings and sought to present analysis in a manner that is balanced and cognizant of diverse stakeholder perspectives.

Table 3. Summary of Methodological Framework for International Relations Research.

Methodological Component	Approach	Rationale
Epistemology	Interpretivist	Recognizes socially constructed nature of IR phenomena
Ontology	Critical Realist	Acknowledges material and ideational dimensions
Research Design	Multi-method qualitative	Enable triangulation and comprehensive analysis
Primary Methods	Literature review, case analysis, policy analysis	Captures academic and policy perspectives
Analysis Technique	Thematic analysis (Braun & Clarke, 2006)	Flexible approach for identifying patterns
Quality Assurance	Audit trail, peer debriefing, member checking	Enhances trustworthiness of findings (Lincoln & Guba, 1985)
Scope	Four priority research domains	Balances depth and breadth of analysis
Data Sources	Academic databases, policy documents, think tank reports	Ensures comprehensive coverage of discourse

Source: Author's compilation based on methodological frameworks from Schwartz-Shea and Yanow (2012), Braun and Clarke (2006), and Lincoln and Guba (1985).

4. Research Domain Analysis

The rapid advancement of transformative technologies and the intensification of environmental and security challenges have dramatically reshaped the landscape of international relations, global governance, and power dynamics. This section provides a comprehensive analysis of four interconnected research domains, each representing a critical area where existing scholarship is insufficient to guide theory and practice. Drawing on the methodological framework established in

 doi:10.20944/preprints202603.0170.v2

Section 3, the analysis identifies specific research gaps through systematic examination of existing literature and proposes frameworks for addressing these deficiencies. Through a combination of literature review, thematic analysis, and comparative case examination, this research domain analysis sets the foundation for addressing some of the most pressing and underexplored questions in contemporary global affairs.

4.1. AI Governance and Global Power Dynamics

Artificial intelligence is rapidly becoming a pivotal force in shaping global power dynamics and governance structures. The governance of AI—encompassing regulatory frameworks, ethical standards, and strategic policy decisions—plays a crucial role in determining how states and other actors wield influence, form alliances, and compete on the world stage. As Horowitz (2018) argued, AI may prove to be one of the most consequential technologies in the history of international competition, potentially reshaping the balance of power as fundamentally as industrialization or nuclear weapons did in earlier eras. This section introduces the central themes and research questions at the intersection of AI governance and international power relations, highlighting the need to move beyond traditional concepts of power to understand AI's transformative impact on the structure and behavior of global actors.

4.1.1. Research Gap Identification

The intersection of artificial intelligence and international relations represents one of the most significant and underexplored areas in contemporary scholarship. Existing literature inadequately addresses how artificial intelligence reshapes power distribution among states and non-state actors. Traditional concepts of hard and soft power, even as reconceptualized by Nye (2011) in his framework of "smart power," fail to capture AI's dual nature as both military capability and economic multiplier. The gap is particularly evident in understanding how AI leadership affects alliance structures, deterrence dynamics, and the fundamental nature of international competition (Payne, 2021). While substantial attention has been devoted to the technical and ethical dimensions of AI development, the implications for international relations theory and practice remain significantly underdeveloped.

The literature on AI governance has predominantly focused on technical standards, ethical guidelines, and regulatory frameworks at the national and international levels. Important work has examined the European Union's AI Act, China's AI development strategy, and various multilateral initiatives to establish norms for responsible AI development. However, this scholarship often treats AI governance as a discrete policy domain rather than analyzing its implications for broader patterns of international relations (Maas, 2019). The question of how AI capabilities affect state power, alliance politics, and international order requires theoretical innovation that existing literature does not adequately provide. Scharre (2018) made significant strides in analyzing autonomous weapons and their implications for military affairs, but the broader political and diplomatic dimensions of AI competition remain undertheorized.

A particularly significant gap concerns the role of technology transfer as a strategic tool and its implications for power dynamics. The U.S.-China competition in AI development has been extensively documented, but analytical frameworks for understanding this competition remain underdeveloped. The emergence of export controls on advanced semiconductors, restrictions on technology investment, and concerns about technology transfer through academic collaboration represent new forms of strategic competition that existing theoretical frameworks struggle to analyze (Congressional Research Service, 2025). Furthermore, the literature has not adequately addressed how AI governance interacts with existing international institutions and regimes. The proliferation of AI-related initiatives across multiple forums—from the G7 and G20 to UNESCO and the International Telecommunication Union—creates coordination challenges and opportunities for forum shopping that existing institutional theory, even the regime complex framework of Keohane and Victor (2011), cannot fully explain.

 doi:10.20944/preprints202603.0170.v2

4.1.2. Proposed Research Framework

Addressing these gaps requires developing new theoretical models that link AI development indices to traditional power metrics while accounting for the unique characteristics of AI as a transformative technology. Such models must incorporate both material capabilities—computing infrastructure, talent pools, investment levels—and intangible factors such as regulatory influence, standard-setting capacity, and soft power associated with AI leadership. The framework should enable analysis of how AI capabilities interact with other dimensions of national power and how AI leadership affects state behavior in the international system, drawing upon but extending existing frameworks of power analysis.

Case studies should include the U.S.-China AI competition, EU regulatory approaches, and the role of middle powers in navigating great power technology competition. Each case offers distinct analytical opportunities. The U.S.-China competition provides insight into how AI capabilities affect bilateral relationships and alliance structures, particularly regarding the semiconductor supply chain and the strategic implications of export controls. The EU approach demonstrates how regulatory power can substitute for technological leadership in certain domains, as the Brussels Effect described by Bradford (2020) illustrates how the EU's regulatory capacity extends its influence over global technology governance. Middle powers such as South Korea, Japan, Canada, and Israel offer perspectives on how states can maintain strategic autonomy and technological development capacity amid great power competition. The research should also examine the emergence of new security dilemmas associated with AI development, building upon classical security theory while adapting it to the distinctive characteristics of AI competition.

Table 4. Key Research Dimensions in AI Governance and Global Power Dynamics.

Research Dimension	Key Questions	Analytical Approach
Power Distribution	How does AI reshape relative capabilities among states?	Development of AI power indices
Alliance Politics	How do AI capabilities affect alliance structures and cohesion?	Comparative case analysis
Technology Transfer	What are the strategic implications of AI-related technology controls?	Policy document analysis
Security Dilemmas	Do AI capabilities create new security dilemma dynamics?	Theoretical modeling
Governance Mechanisms	What governance structures emerge for AI at international level?	Institutional analysis
Non-State Actors	What role do corporations play in AI-driven power dynamics?	Network analysis
Norm Development	How do AI ethics norms emerge and diffuse internationally?	Process tracing

Source: Author's compilation based on analysis of research gaps in AI governance literature (Payne, 2021; Maas, 2019; Cummings, 2017; Horowitz, 2018; Scharre, 2018).

Each research dimension outlined in Table 4 represents a distinct yet interconnected avenue for advancing the study of AI governance and its impact on global power structures. The development of AI power indices, for example, offers a quantitative approach to evaluating how technological capabilities translate into shifts in state influence. This method can be complemented by comparative

 doi:10.20944/preprints202603.0170.v2

case analysis, which examines the effects of AI adoption on alliance cohesion, as seen in varying responses to AI advancements by NATO, ASEAN, and other multilateral organizations.

Policy document analysis is crucial for understanding the strategic implications of technology transfer, particularly in the context of export controls and investment restrictions. Such inquiries can shed light on the evolving nature of economic statecraft and the emergence of new tools for managing international competition. Theoretical modeling of security dilemmas, meanwhile, is necessary to capture the unique risks and uncertainties introduced by AI-driven military capabilities, including autonomous systems and cyber warfare. Institutional analysis allows scholars to map the proliferation of governance mechanisms at the international level, from formal treaties to informal norms and cross-sectoral initiatives. The role of non-state actors, particularly multinational corporations and research consortia, is increasingly prominent in shaping AI standards and influencing global power dynamics. Network analysis can illustrate how these actors form alliances, compete, and interact with state authorities.

Moreover, process tracing of norm development provides insight into how ethical standards for AI are negotiated, contested, and diffused across cultures and jurisdictions. This approach is vital for understanding the soft power dimensions of AI leadership and the ways in which states and non-state actors seek to shape the normative landscape of emerging technologies. Collectively, these analytical approaches establish a robust foundation for future research, enabling scholars and practitioners to address the complex, multifaceted challenges posed by AI governance in the international arena. As the landscape continues to evolve, interdisciplinary frameworks and innovative methodologies will be essential for capturing the full scope of AI's transformative effects on global power dynamics.

Table 5. AI Governance Initiatives and Their International Relations Implications.

Initiative/Framework	Key Actors	Governance Focus	IR Implications
EU AI Act (2024)	European Union member states	Risk-based regulation, transparency	Regulatory power projection, Brussels Effect
U.S. Executive Orders on AI	United States federal government	Safety, security, innovation balance	Great power standard-setting
China's AI Development Plan	Chinese government, state enterprises	Strategic development, military-civil fusion	Technology competition, power transition
OECD AI Principles	OECD member states	Responsible AI, human-centered values	Liberal norm diffusion
UNESCO AI Ethics Recommendation	193 member states	Ethics, human rights, sustainability	Universal norm-building
G7 Hiroshima AI Process	G7 states	Responsible AI for advanced systems	Alliance-based governance

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Source: Author's compilation based on policy analysis of major AI governance frameworks (Maas, 2019; Congressional Research Service, 2025; Bradford, 2020).

The initiatives summarized in Table 5 illustrate the diverse landscape of AI governance and its far-reaching consequences for international relations. Each framework not only reflects the priorities and values of its participating actors, but also serves as a mechanism for projecting influence, shaping global standards, and contesting power in the technological domain. For example, the EU AI Act's risk-based regulatory approach positions the European Union as a global standard-setter, with the "Brussels Effect" extending the impact of its regulations beyond its borders. Similarly, the United States leverages executive orders to balance innovation, safety, and security, signaling its intent to remain at the forefront of global AI governance and to set benchmarks for responsible technology development.

China's AI Development Plan, by contrast, emphasizes strategic advancement and military-civil fusion, highlighting the centrality of technology competition and power transition in its approach. This framework underscores the geopolitical dimensions of AI, as states vie for leadership and technological supremacy. Meanwhile, the OECD AI Principles and UNESCO's AI Ethics Recommendation represent efforts to diffuse liberal and universal norms, respectively, promoting responsible AI and human-centered values across a broad international spectrum. These initiatives contribute to the emergence of shared ethical standards but also reflect underlying tensions between universalism and regional or national particularities.

The G7 Hiroshima AI Process further demonstrates the role of alliances and multilateral cooperation in shaping governance approaches for advanced AI systems. By coordinating among like-minded states, these processes foster alliance-based governance and signal collective commitment to responsible innovation. The proliferation of such initiatives highlights both the fragmentation and convergence of global AI governance, raising important questions about interoperability, norm diffusion, and the potential for regulatory competition or cooperation.

Taking together, these frameworks exemplify the dynamic interplay between regulatory, ethical, and strategic considerations in the international system. They reveal how states and international organizations are actively negotiating the rules of engagement for emerging technologies, while simultaneously seeking to shape the global distribution of power and influence. As AI continues to transform economic, security, and societal domains, the evolution of governance initiatives will remain a critical area for scholarly inquiry and policy development—one that demands attention to both the material and normative dimensions of global power shifts.

4.2. Climate Security and Interstate Conflict

The intersection of climate change and security has emerged as a critical area of concern within international relations, particularly as environmental stress increasingly shapes the dynamics between states. Climate security examines how shifts in environmental conditions—such as extreme weather events, resource scarcity, and climate-induced migration—can escalate tensions and contribute to interstate conflict. Despite growing recognition of these risks by bodies including the United Nations Security Council, scholarship has often lacked robust frameworks for analyzing the direct and indirect pathways by which climate factors influence state behavior, alliance formation, and the emergence of new security challenges.

4.2.1. Research Gap Identification

Climate change is increasingly recognized as a security threat, yet international relations scholarship lacks robust frameworks linking environmental stress to conflict escalation pathways. Homer-Dixon's (1999) foundational work on environmental scarcity and violence established important theoretical groundwork, but most existing studies continue to treat climate as a background variable rather than analyzing its direct causal mechanisms in shaping international outcomes. The gap is most pronounced in understanding climate's role in alliance formation,

 doi:10.20944/preprints202603.0170.v2

resource competition, and the emergence of new forms of cooperation and conflict that transcend traditional analytical categories (Barnett, 2003). The securitization framework developed by Buzan et al. (1998) offers tools for analyzing how climate becomes constructed as a security issue, but it does not adequately address the material pathways through which environmental change produces security outcomes. While significant attention has been devoted to climate change as an environmental and economic issue, the security dimensions require more systematic theoretical and empirical investigation.

The literature on climate and conflict has produced contested findings regarding the relationship between environmental stress and violent conflict. Some studies find significant correlations between temperature anomalies, rainfall variability, and conflict incidence, while others emphasize the importance of political institutions, economic conditions, and social factors in mediating these relationships (Mach et al., 2019). Gleditsch (2012) cautioned against simplistic claims linking climate directly to conflict, arguing instead for attention to the complex interplay of environmental, political, and economic factors. These debates reflect both methodological challenges, including issues of spatial and temporal scale, measurement, and causal identification—and theoretical limitations regarding the mechanisms through which environmental change translates into political outcomes. The question of how climate change interacts with existing political, economic, and social structures to produce security outcomes remains inadequately addressed. Furthermore, the literature has focused predominantly on intrastate conflict, with relatively less attention to interstate dynamics and the implications for international relations.

A particularly significant gap concerns the potential for climate cooperation to serve as a confidence-building measure and contribute to broader patterns of peace and stability. While environmental peacemaking has received some scholarly attention, the specific mechanisms through which climate cooperation might contribute to security remain underexplored. The Paris Agreement and other multilateral frameworks create opportunities for cooperation, but the security implications of these arrangements require systematic analysis that current literature does not adequately provide. Additionally, literature has not adequately addressed the implications of climate change for sovereignty and territorial integrity. Rising sea levels threaten the existence of small island states, while the opening of Arctic shipping routes creates new geopolitical competition, with implications for concepts of sovereignty, territory, and international law that remain underexplored in existing scholarship (Barnett & Adger, 2007).

4.2.2. Proposed Research Framework

Research on climate security should examine multiple causal pathways linking environmental stress to international outcomes, employing frameworks that capture both the material and social dimensions of climate-security linkages. First, comparative analysis of water conflict resolution mechanisms can identify factors that promote cooperation rather than conflict over shared resources, building upon existing work on transboundary water governance while extending it to address the intensifying pressures created by climate change. Second, investigation of climate-induced migration as a driver of regional instability requires integration of migration studies with security analysis, examining both the direct effects of population movement and the indirect effects on host communities and interstate relations. Third, analysis of climate cooperation as a confidence-building measure can contribute to understanding environmental peacemaking, examining how shared environmental challenges might create opportunities for diplomatic engagement even among adversaries.

The research should adopt a multi-level analytical framework that examines climate security at the local, national, regional, and global levels. Climate impacts operate differently at each level, and the interactions between levels create complex dynamics that single-level analysis cannot capture. Local-level conflicts over resources may escalate to national and regional levels, while global governance frameworks shape local and national responses. Furthermore, the research should examine the emerging concept of the "climatization of security"the process by which climate change

 doi:10.20944/preprints202603.0170.v2

becomes integrated into security discourse and institutions. This includes analysis of how security agencies are incorporating climate considerations into threat assessments, how climate issues are being securitized in political discourse, and the implications of these processes for both security policy and climate governance.

Table 6. Climate Security Dimensions and Their Impacts on International Relations.

Security Dimension	Climate Factor	Potential Outcomes	Analytical Framework
Resource Competition	Water scarcity, agricultural stress	Conflict or cooperation over shared resources	Transboundary resource governance theory
Migration Pressures	Sea-level rise, extreme weather	Cross-border movement, regional instability	Migration-security nexus analysis
Territorial Change	Rising sea levels, Arctic opening	Sovereignty disputes, new shipping routes	Sovereignty and territorial integrity law
Food Security	Agricultural disruption, yield decline	Price volatility, civil unrest, trade conflicts	Food systems and political stability
Cooperation Opportunities	Shared environmental challenges	Environmental peacemaking, institutional development	Environmental peacebuilding theory
Securitization Dynamics	Climate as security threat	Policy changes, institutional adaptation	Copenhagen School securitization framework
Infrastructure Vulnerability	Extreme weather, flooding	Critical infrastructure failure, cascade effects	Resilience and adaptation governance

Source: Author's compilation based on climate security literature (Barnett, 2003; Mach et al., 2019; Barnett & Adger, 2007; Homer-Dixon, 1999; Buzan et al., 1998).

4.3. Digital Sovereignty in the Global South

As the digital revolution transforms economies and societies worldwide, questions of digital sovereignty have become increasingly central for countries seeking to shape their own technological futures. While much of the academic and policy debate has focused on the strategies and interests of major powers, the challenges and opportunities faced by nations in the Global South remain comparatively understudied. For developing countries across Africa, Latin America, and Southeast Asia, digital sovereignty is not only a matter of national security or geopolitical alignment, but also a critical factor in economic development, social equity, and the ability to participate meaningfully in global digital governance. Acharya (2014) argued that the discipline of international relations must engage more seriously with perspectives from the Global South to achieve both analytical validity and normative legitimacy, a call that is especially urgent in the domain of digital governance.

 doi:10.20944/preprints202603.0170.v2

4.3.1. Research Gap Identification

Western-centric international relations theories inadequately explain how developing nations navigate digital dependency while asserting sovereignty. Existing literature on digital governance focuses predominantly on great power competition—particularly the U.S.-China technology rivalry—with insufficient attention to the strategic choices available to smaller states and the distinctive challenges facing countries in the Global South (Couture & Toupin, 2019). The conceptual gap in understanding "digital non-alignment" strategies limits policy guidance for emerging economies that must navigate between competing technological powers while pursuing development objectives. This gap is particularly consequential given that decisions made now about digital infrastructure, data governance, and technology partnerships will have long-lasting structural implications for economic development and political autonomy.

The literature on digital sovereignty has emerged primarily from European and North American scholarship, with correspondingly limited attention to perspectives from the Global South. European debates about data localization, privacy regulation, and digital autonomy reflect specific concerns about U.S. technology dominance and Chinese technology influence that may not capture the priorities and constraints facing developing countries. Countries in Africa, Latin America, and Southeast Asia face distinct challenges related to digital infrastructure deficits, human capital limitations, and development priorities that shape their approaches to digital sovereignty in ways that existing literature inadequately addresses. Floridi (2020) provided important conceptual groundwork on digital sovereignty, but his analysis remained focused primarily on European and advanced-economy contexts.

A particularly significant gap concerns the relationship between digital sovereignty and development. While digital transformation is widely recognized as essential for economic development, the tensions between asserting digital sovereignty and accessing global digital infrastructure and services remain underexplored. Zuboff (2019) illuminated how surveillance capitalism creates structural asymmetries in the global digital economy, yet the specific implications for developing countries—where bargaining power vis-à-vis technology corporations may be limited—require further investigation. The phenomenon of "digital colonialism"—the structural dependencies and asymmetries that characterize the relationship between Global South countries and dominant technology powers—represents an important direction for research that bridges international relations, development studies, and science and technology studies.

4.3.2. Proposed Research Framework

Research on digital sovereignty in the Global South should analyze multiple dimensions of the phenomenon. First, comparative study of data localization policies across Southeast Asia, Africa, and Latin America can identify patterns, determinants, and consequences of different approaches, examining how domestic political economies, institutional capacities, and international pressures shape policy choices. Second, evaluation of multilateral digital governance initiatives—including those led by or focused on developing countries—can illuminate opportunities and constraints for collective action, analyzing how institutions such as the African Union and ASEAN are developing regional digital governance frameworks. Third, assessment of technology diversification as a hedging strategy can inform understanding of how states balance dependence on competing technology powers, drawing on alliance theory and hedging frameworks from security studies adapted to the technology domain.

The research should prioritize giving voice to non-Western perspectives and policy approaches through engagement with scholarship and policy discourse from the Global South, following Acharya's (2014) call for a more inclusive and globally representative discipline. This requires moving beyond analysis of Global South countries as objects of great power competition to understanding their agency in shaping digital governance outcomes. Additionally, the research should examine the emerging phenomenon of "digital non-alignment"—strategies by which states seek to maintain autonomy and flexibility in their technology relationships without fully aligning

 doi:10.20944/preprints202603.0170.v2

with either major technology power—understanding the conditions under which such strategies are feasible and the tools available to states pursuing them.

Table 7. Comparative Models of Digital Sovereignty in the Global South.

Model	Key Features	Representative Cases	Theoretical Implications
State-Led Development	Government-driven digital infrastructure, local champions	China, Vietnam, Ethiopia	State capacity and developmental state theory
Regulatory Assertion	Strong data localization, privacy frameworks	India, Brazil, Indonesia	Regulatory sovereignty and market power
Strategic Hedging	Balancing engagement with multiple tech powers	Southeast Asian states, Kenya	Alliance theory adapted to technology domain
Regional Integration	Collective digital infrastructure, shared standards	African Union, ASEAN	Regional governance and collective action
Open Digital Economy	Minimal restrictions, foreign investment focus	Singapore, Rwanda, UAE	Liberal economic integration theory
Digital non-alignment	Autonomous positioning between tech powers	Brazil, South Africa, Mexico	Non-alignment theory in digital context

Source: Author's compilation based on analysis of digital sovereignty approaches (Couture & Toupin, 2019; European Centre for Development Policy Management, 2024; Policy Center for the New South, 2025).

Table 8. Digital Infrastructure and Governance Indicators in Selected Global South Regions.

Indicator	Sub-Saharan Africa	Southeast Asia	Latin America	Key Governance Challenge
Internet Penetration	~40%	~75%	~75%	Access equity and digital divide
Local Data Center Capacity	Very limited	Growing	Moderate	Data sovereignty and localization
Domestic Platform Ecosystem	Nascent	Moderate	Moderate	Dependency on foreign platforms

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Data Protection Legislation	Emerging (30+ countries)	Varied (ASEAN framework)	Moderate (LGPD in Brazil)	Regulatory capacity and enforcement
Digital Skills Workforce	Limited	Growing rapidly	Moderate	Human capital for technology governance
Regional Coordination	AU Digital Transformation Strategy	ASEAN Digital Masterplan	Limited regional frameworks	Collective bargaining power

Source: Author's compilation based on digital governance literature and policy reports (European Centre for Development Policy Management, 2024; Centre for International Governance Innovation, 2024; Policy Center for the New South, 2025).

4.4. Non-State Actors and Hybrid Warfare

Hybrid warfare has fundamentally reshaped the landscape of international security by blending conventional and unconventional conflict, often blurring the boundaries between state and non-state actors. While traditional analyses of warfare have focused on the actions and strategies of sovereign states, the rise of non-state entities—ranging from private military companies to cyber mercenaries and media networks—has added new layers of complexity to contemporary conflict dynamics. These actors not only serve as proxies, agents, or collaborators for state interests, but also pursue independent agendas, making attribution, regulation, and response increasingly challenging. Understanding the diverse roles that non-state actors play in hybrid warfare is essential for developing effective theoretical frameworks, policy responses, and governance mechanisms that address the evolving nature of twenty-first century conflict.

4.4.1. Research Gap Identification

Hybrid warfare studies focus disproportionately on state actors, underestimating the role of non-state entities as both perpetrators and victims of hybrid threats. Theoretical frameworks for analyzing proxy relationships, deniability mechanisms, and attribution challenges remain underdeveloped, impeding understanding of contemporary conflict dynamics where state and non-state boundaries increasingly blur (Reichborn-Kjennerud & Olsen, 2019). Kaldor (2012) identified the growing importance of non-state violence in contemporary conflicts, yet her "new wars" framework requires extension to encompass the sophisticated hybrid operations that characterize recent conflicts in Ukraine, Syria, Libya, and the Sahel. The evolution of warfare in the twenty-first century has fundamentally challenged traditional categories of analysis, yet international relations scholarship has not adequately adapted to these changes.

The literature on private military companies has grown significantly in recent years, particularly following the prominent role of such entities in conflicts including Ukraine and various African theaters. Avant (2005) provided foundational analysis of how the market for force operates, examining the conditions under which states privatize security functions and the consequences for accountability and governance. However, subsequent developments—including the expansion of Russian-linked PMC operations across Africa, the use of contractors in cyber operations, and the proliferation of private intelligence and surveillance services—have outpaced theoretical development. The question of how states use PMCs to achieve strategic objectives while maintaining plausible deniability requires systematic analysis that extends beyond existing frameworks.

A particularly significant gap concerns cyber mercenaries and the broader phenomenon of non-state actors conducting offensive cyber operations on behalf of states or other entities. The attribution

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problem in cyberspace, extensively documented by scholars of cyber security, creates opportunities for states to employ non-state actors while denying responsibility, yet existing frameworks for understanding this phenomenon remain underdeveloped. The role of influence operations conducted through non-state media networks similarly requires analysis that bridges security studies and media studies in ways that existing frameworks do not accommodate. Furthermore, literature has not adequately addressed the challenges that hybrid warfare poses for international law and institutions, including the difficulty of applying existing legal frameworks designed for interstate conflict to operations involving complex webs of state and non-state actors.

4.4.2. Proposed Research Framework

Research on non-state actors in hybrid warfare should develop typologies of state-non-state relationships that capture the diversity of arrangements and their implications for international security. Such typologies must distinguish between different forms of relationship—delegation, proxy, sponsorship, franchise, and others—while analyzing the conditions under which each form is likely to emerge and the strategic implications for both state and non-state actors. The framework should build upon Avant's (2005) analysis of the market for force while extending it to encompass the broader range of non-state actor involvement in contemporary hybrid operations.

Case studies should include private military companies as instruments of state power, with particular attention to Russian-linked PMC operations; cyber mercenaries and the challenges they pose for attribution and deterrence; and influence operations through non-state media networks that blur the boundary between journalism, propaganda, and strategic communication. Comparative analysis across these cases can identify patterns regarding the conditions under which states employ non-state actors, the mechanisms through which accountability and control are maintained or eroded, and the implications for international governance. The research should also examine regulatory and governance challenges, including analysis of existing legal frameworks such as the Montreux Document on private military companies and their adequacy for addressing contemporary challenges.

Table 9. Typology of Non-State Actors in Hybrid Warfare.

Non-State Actor Type	Hybrid Warfare Role	State Relationship	Governance Challenge
Private Military Companies	Kinetic operations, security services	Contract, delegation, proxy	Accountability, international humanitarian law
Cyber Mercenaries	Offensive cyber operations, surveillance	Implicit authorization, sponsorship	Attribution, jurisdiction
Media Networks	Influence operations, disinformation	Covert support, amplification	Free speech vs. information warfare
Economic Actors	Sanctions evasion, resource extraction	Facilitation, toleration	Financial regulation, transparency
Proxy Forces	Irregular warfare, deniable operations	Training, equipping, directing	International law, civilian protection

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Platform Companies	Information control, data access	Regulation, cooperation, coercion	Content moderation, data sovereignty
Hacktivist Groups	Cyber disruption, data leaks	Opportunistic alignment, independence	Legal status, proportionality

Source: Author's compilation based on hybrid warfare literature (Reichborn-Kjennerud & Olsen, 2019; Geneva Academy of International Humanitarian Law and Human Rights, 2024; TNO Defense Research, 2021; Avant, 2005; Kaldor, 2012).

Table 10. Comparative Analysis of Hybrid Warfare Case Studies.

Case Study	Primary Non-State Actors	Key Hybrid Dimensions	Attribution Challenges	Governance Responses
Ukraine conflict (2014–present)	PMCs, cyber groups, media networks	Military, cyber, information, economic	State denial of PMC involvement	Sanctions, international investigations
Sahel region conflicts	PMCs, proxy forces, extremist groups	Military, governance, resource control	Complex multi-actor environment	AU/ECOWAS frameworks, UN mandates
South China Sea tensions	Maritime militia, coast guard proxies	Gray zone operations, legal warfare	Civilian vs. military classification	UNCLOS proceedings, bilateral diplomacy
Information warfare campaigns	Social media networks, troll farms	Disinformation, election interference	Digital anonymity, cross-border operations	Platform policies, election security measures
Cyber operations (various)	Cyber mercenaries, hacktivist groups	Espionage, sabotage, theft	Technical attribution difficulties	Norms development, deterrence by punishment

Source: Author's compilation based on comparative analysis of hybrid warfare literature (Kaldor, 2012; Reichborn-Kjennerud & Olsen, 2019; Irregular Warfare Center, 2024; Edward Elgar Publishing, 2024).

4.5. Emerging Technologies and Normative Order

Emerging technologies—including quantum computing, biotechnology, advanced robotics, and distributed ledger systems—are rapidly redefining the contours of international relations and global governance. Their transformative potential extends beyond technical innovation, challenging existing normative orders and raising profound questions about sovereignty, agency, and the

 doi:10.20944/preprints202603.0170.v2

evolution of international law. The integration of these technologies into the global system is marked by both opportunity and disruption: they offer pathways to economic growth and enhanced security, yet also introduce novel risks, regulatory dilemmas, and potential sources of instability. As states, non-state actors, and international organizations grapple with the implications of technological change, the capacity of existing frameworks to provide effective governance and normative guidance is increasingly called into question.

Within this domain, the intersection of technology and norm development is particularly salient. The emergence of global standards for privacy, bioethics, digital identity, and autonomous decision-making reflects ongoing contestation over values, interests, and authority. The rapid pace of technological innovation often outstrips the ability of institutions to adapt, resulting in regulatory gaps, fragmented governance, and contested legitimacy. As with AI governance and digital sovereignty, the normative order surrounding emerging technologies is shaped by a complex interplay of material capabilities, political interests, and ideational forces, demanding interdisciplinary and methodologically pluralistic approaches to analysis.

4.5.1. Research Gap Identification

Despite growing scholarly attention, the literature on emerging technologies and normative order remains characterized by significant theoretical and empirical gaps. First, there is limited integration between studies of technological innovation and international relations theory. Existing work often treats technology as an exogenous variable, failing to account for how technological change is endogenous to shifts in global power structures, institutional evolution, and norm contestation (Finnemore & Sikkink, 1998). The lack of conceptual tools for analyzing the co-evolution of technology and norms impedes understanding of how new technologies reshape the distribution of agency among states, corporations, and transnational networks.

Second, empirical research tends to focus on discrete policy domains—such as cybersecurity, biosecurity, or digital identity—without systematically examining cross-domain interactions. This fragmentation limits the ability to theorize about the broader dynamics of normative order in the face of technological disruption. The literature on quantum governance, for example, is still nascent and rarely connects to parallel debates in biotechnology or blockchain regulation (Gheorghe, 2023). Moreover, much of the existing research is regionally or sectorally bounded, with insufficient attention to the global South, small states, and non-Western perspectives on technology governance.

Third, there is a persistent gap in empirical analysis of norm diffusion and contestation in emerging technology domains. While constructivist scholarship has illuminated the processes by which norms are negotiated and institutionalized, the specific mechanisms by which technological standards, ethical principles, and regulatory models are diffused across jurisdictions remain underexplored (Florini, 2007). The role of informal networks, epistemic communities, and private standard-setting organizations is especially salient, yet often overlooked in mainstream international relations research. The consequences of regulatory fragmentation—where competing standards coexist or conflict—have yet to be systematically analyzed in terms of their impact on global order and stability.

4.5.2. Proposed Research Framework

To address these gaps, research on emerging technologies and normative order should adopt a multi-dimensional, interdisciplinary framework. First, theoretical models should integrate insights from international relations, science and technology studies, legal scholarship, and organizational theory to capture the co-evolution of technology and norms. Analyses ought to move beyond state-centric paradigms, incorporating the agency of multinational corporations, standard-setting bodies, and transnational advocacy networks in shaping both technological trajectories and normative outcomes.

Second, methodological pluralism is essential. Comparative case studies should be conducted across technology domains—such as quantum governance, gene editing, autonomous systems, and

 doi:10.20944/preprints202603.0170.v2

blockchain regulation—to identify patterns of norm emergence, contestation, and institutionalization. Process tracing and network analysis can illuminate the pathways through which norms are diffused, adapted, and resisted. Quantitative indicators of technological adoption, regulatory harmonization, and norm compliance may be developed to complement qualitative approaches, enabling more robust cross-domain and cross-national comparisons.

Third, empirical research should prioritize the inclusion of diverse perspectives, especially from the global South and smaller states, whose experiences with emerging technologies are often shaped by distinct developmental priorities, capacity constraints, and geopolitical pressures. The examination of regional governance initiatives—such as the African Union's biotechnology strategy or ASEAN's digital identity framework—can provide valuable insights into alternative models of normative order and collective action.

Potential case studies include:

- Quantum technology governance: Comparison of national strategies (U.S., China, EU) and the role of international standard-setting bodies.
- Biotechnology and gene editing: Analysis of regulatory divergence, ethical debates, and the global diffusion of bioethics norms.
- Blockchain and digital identity: Examination of cross-border interoperability, privacy standards, and the emergence of decentralized governance models.
- Autonomous systems: Study of norm development in military and civilian applications, with attention to international humanitarian law and accountability mechanisms.

Table 11. Key Dimensions, Actors, and Governance Challenges in Emerging Technology Domains.

Technology Domain	Key Actors	Governance Challenge	Normative Issues	Analytical Approach
Quantum Computing	States, tech corporations, standards bodies	Regulatory harmonization, dual-use risks	Security, privacy, economic competitiveness	Institutional analysis, process tracing
Biotechnology/Gene Editing	States, scientific communities, NGOs	Ethical regulation, cross-border transfer	Bioethics, human rights, safety	Comparative case analysis, norm diffusion
Blockchain/Digital Identity	States, tech firms, civil society	Interoperability, privacy, regulatory fragmentation	Data sovereignty, trust, inclusion	Network analysis, policy document review
Autonomous Systems	States, military, industry, advocacy groups	Accountability, legal adaptation	International law, proportionality, ethics	Process tracing, legal analysis

 doi:10.20944/preprints202603.0170.v2

Synthetic Media/Deepfakes	Tech companies, media, governments	Disinformation, reputational risk	Free speech, authenticity, public trust	Content moderation policy analysis

Synthesis and Implications for Theory and Policy

The analysis of emerging technologies and normative order extends and complements the preceding research domains, reinforcing the imperative for interdisciplinary, methodologically pluralistic approaches to international relations scholarship. Like AI governance, climate security, digital sovereignty, and hybrid warfare, the governance of emerging technologies is marked by contestation, fragmentation, and persistent uncertainty. The interplay between technological innovation and normative evolution challenges the adequacy of traditional international relations theories, such as structural realism, institutionalism, or constructivism—requiring the development of new conceptual tools that can account for the dynamic co-constitution of technology, agency, and order.

For policymakers, the findings underscore the necessity of anticipatory governance, regulatory agility, and multi-stakeholder engagement. The pace and scope of technological change demand proactive efforts to develop inclusive, adaptable frameworks for norm development and institutional adaptation. Effective governance will depend on the capacity to integrate diverse perspectives, reconcile competing values, and foster cooperation across domains and jurisdictions.

For scholars, the research agenda outlined here points to opportunities for theoretical innovation, empirical rigor, and cross-disciplinary collaboration. Future work should continue to bridge gaps between technological studies and international relations, prioritize comparative and longitudinal analysis, and contribute to the development of global governance mechanisms that are both effective and legitimate in the face of accelerating technological transformation.

5. Discussion

This section synthesizes the main findings of the research, drawing together insights from the preceding analysis of AI governance, climate security, digital sovereignty, and hybrid warfare. By considering both the limitations of traditional approaches and the distinct challenges posed by contemporary developments, the discussion highlights the need for new conceptual frameworks, interdisciplinary strategies, and innovative policy responses.

5.1. Theoretical Implications

The analysis of these four research domains reveals significant theoretical implications for international relations scholarship. Across all domains, traditional theoretical frameworks prove inadequate for addressing emerging challenges, requiring fundamental reconsideration rather than incremental extension. The limitations are particularly evident in the assumptions underlying traditional theories about the nature of power, the boundaries of the international system, and the actors who matter in international relations. Waltz's (1979/2010) structural realism, Keohane's (1984) institutional liberalism, and Wendt's (1999) social constructivism each capture important dimensions of international relations, but none individually or collectively provides an adequate framework for analyzing phenomena that blur the boundaries between their respective domains of analysis.

The concept of power emerges as particularly problematic across all four research domains. Traditional distinctions between hard and soft power, even as refined by Nye (2011), fail to capture the nature of power in an era of AI, digital platforms, and hybrid threats. AI capabilities represent a form of power that is simultaneously material and ideational, military and economic, coercive and attractive. Digital sovereignty challenges traditional notions of territorial power, while hybrid

 doi:10.20944/preprints202603.0170.v2

warfare blurs distinctions between military and civilian, state and non-state forms of power. Farrell and Newman's (2019) concept of weaponized interdependence captures one dimension of this transformation, but a more comprehensive reconceptualization of power is needed that accounts for the full range of dynamics identified in this analysis.

The question of agency similarly requires fundamental reconsideration. The analysis presented here demonstrates that technology corporations developing AI systems, private military companies conducting military operations, cyber mercenaries launching attacks, and digital platforms shaping information all exercise significant agency in international relations that cannot be captured by state-centric frameworks. Risse's (2000) communicative action approach and constructivist network analysis offer partial tools for analyzing non-state actor agency, but more comprehensive frameworks are needed that can model the complex interactions between state and non-state actors across multiple domains simultaneously. The relationship between domestic and international politics requires re-examination in light of these findings, as hybrid operations, digital governance, and climate impacts all demonstrate the inadequacy of treating these as separate analytical domains.

5.2. Methodological Implications

The research gaps identified in this analysis have significant methodological implications for international relations scholarship. The complexity of phenomena examined across the four domains resists analysis through single-method approaches. The interpretive qualitative approach employed in this study has proven valuable for identifying conceptual gaps and developing theoretical frameworks, but advancing knowledge in these domains will require methodological pluralism. Mixed methods approach that combine qualitative case analysis with quantitative indicators of AI capabilities, climate impacts, digital infrastructure, and hybrid warfare incidents are likely to be most productive for addressing the research gaps identified here.

The analysis also suggests the importance of interdisciplinary approaches. AI governance requires engagement with computer science, engineering, and ethics alongside political science and international relations. Climate security demands integration of environmental science, economics, and security studies. Digital sovereignty involves legal, technical, and political dimensions that cannot be adequately addressed within disciplinary boundaries. Hybrid warfare requires understanding of military affairs, cyber security, media studies, and political communication. These interdisciplinary requirements present both challenges—including different epistemological traditions, methodological standards, and disciplinary vocabularies—and opportunities for generating insights that no single discipline can provide independently.

Data availability and quality present significant challenges for research in these domains. AI development involves proprietary technologies and corporate decisions that may not be publicly documented. Climate impacts and responses vary significantly across locations and time periods, creating challenges for comparative analysis. Digital sovereignty policies are evolving rapidly, with policy documents in multiple languages and rapidly changing regulatory frameworks. Hybrid warfare operations are, by their nature, conducted covertly, making systematic data collection difficult. These data challenges require methodological innovation, including creative approaches to data collection such as open-source intelligence analysis, satellite imagery, and digital trace data, as well as transparent acknowledgment of limitations.

5.3. Policy Implications

The research gaps identified in this analysis have significant implications for policymakers seeking evidence-based guidance on emerging challenges. The disconnect between academic research and policy needs in these domains creates risks of poorly informed decisions, missed opportunities for effective action, and potential for unintended consequences from policies that do not adequately account for the complexity of the phenomena they address. In AI governance, policymakers require frameworks for understanding how AI capabilities affect strategic competition, alliance management, and international cooperation—analysis that current scholarship cannot fully

 doi:10.20944/preprints202603.0170.v2

provide. In climate security, decision-makers need analysis of causal pathways linking climate change to conflict and cooperation, as well as evaluation of intervention options that integrate environmental and security considerations. In digital sovereignty, governments in the Global South require guidance on balancing development objectives with autonomy concerns in an international environment shaped by great power technology competition. In hybrid warfare, security agencies need updated frameworks for threat assessment and response planning that account for the expanding role of non-state actors.

The relationship between academic research and policy communities requires structural attention. The gaps identified in this analysis reflect in part the incentive structures of academic research, which may not reward policy-relevant work, rapid response to emerging issues, or interdisciplinary collaboration. Mechanisms for better connecting academic research to policy needs—including funding for policy-relevant research, forums for researcher-policymaker engagement, and recognition of policy impact in academic evaluation—could help narrow the gap between scholarly analysis and policy requirements.

5.4. Cross-Domain Patterns and Interconnections

A significant finding emerging from this analysis concerns the interconnections between the four research domains. These are not isolated areas requiring separate scholarly attention but rather interrelated phenomena that share common features and interact in complex ways. The intersection of AI governance and hybrid warfare is particularly significant: AI capabilities are increasingly employed in cyber operations, influence campaigns, and autonomous weapons systems, while the use of AI by both state and non-state actors in hybrid warfare contexts creates new challenges for attribution, deterrence, and conflict management (Scharre, 2018). The relationship between climate security and digital sovereignty presents another important interconnection, as environmental monitoring and climate data collection increasingly rely on digital infrastructure that raises questions about data sovereignty and technological dependency.

These cross-domain interconnections suggest that the research gaps identified in this study cannot be addressed in isolation. Theoretical innovation must account for the ways in which AI capabilities, environmental pressures, digital governance, and hybrid security threats interact to create complex adaptive challenges that resist decomposition into discrete analytical domains. Similarly, methodological approaches must be capable of capturing these interconnections through multi-level, multi-domain analysis. The development of integrated analytical frameworks that can address cross-domain dynamics while maintaining sufficient specificity to generate actionable insights represents one of the most important—and challenging—directions for future scholarships.

Table 11. Cross-Domain Interconnections and Research Priorities.

Domain Intersection	Key Linkages	Research Priority	Methodological Approach
AI Governance × Hybrid Warfare	Autonomous weapons, AI-enabled cyber operations, deepfakes	AI in conflict attribution and escalation dynamics	Case studies, simulation modeling
AI Governance × Climate Security	AI for climate modeling, environmental monitoring, resource optimization	AI applications in climate adaptation and conflict prevention	Interdisciplinary modeling

 doi:10.20944/preprints202603.0170.v2

AI Governance × Digital Sovereignty	AI development dependency, algorithmic governance, data extraction	Technology dependency and AI capacity building in Global South	Comparative policy analysis
Climate Security × Digital Sovereignty	Environmental data governance, satellite monitoring, climate data ownership	Data sovereignty in climate science and governance	Multi-stakeholder analysis
Climate Security × Hybrid Warfare	Resource conflict, climate migration as destabilizer, weaponization of environmental data	Climate stress as catalyst for hybrid operations	Multi-level causal analysis
Digital Sovereignty × Hybrid Warfare	Information operations through platforms, cyber operations, digital surveillance	Platform governance and information warfare regulation	Network analysis, legal analysis

Source: Author's compilation based on cross-domain analysis of research gaps identified in this study.

Building on the synthesis of cross-domain interconnections and research priorities, future analytical work in international relations must not only recognize but actively integrate the multidimensional nature of contemporary challenges. The intersections outlined in Table 11 illustrate that no single domain—whether AI governance, climate security, digital sovereignty, or hybrid warfare—can be understood in isolation. Rather, the emergence of complex linkages, such as AI-driven cyber operations within hybrid warfare or the reliance of climate science on digital infrastructure, requires scholars and policymakers to adopt analytical frameworks capable of capturing these systemic interactions.

Such integration demands a rethinking of both theoretical and methodological tools. Traditional models, which often focus on dyadic relations or discrete sectoral challenges, fall short when confronted with phenomena that are inherently cross-sectoral and adaptive. For example, the weaponization of environmental data in hybrid operations, or the dependency of Global South nations on external AI technologies for climate adaptation, underscores the need for frameworks that account for feedback loops, emergent behavior, and multi-level causality. The adoption of interdisciplinary approaches—combining insights from political science, computer science, environmental studies, law, and security studies—will be essential to developing robust analytical models that can inform both academic understanding and practical policy design.

Moreover, methodological pluralism is vital. The challenges of data availability and quality, especially in domains characterized by proprietary technologies, covert operations, or rapidly evolving policy landscapes, require creative solutions. Mixed-methods research, leveraging case studies, simulation modeling, open-source intelligence, and quantitative indicators, can help bridge empirical gaps and provide richer evidence base for analysis. Transparency about methodological limitations, as well as ongoing adaptation to new data sources and analytical techniques, will be crucial for maintaining rigor and relevance as the international environment continues to evolve.

 doi:10.20944/preprints202603.0170.v2

Finally, the implications for policy are profound. The urgency of real-world challenges—ranging from the attribution of cyberattacks to the governance of climate migration—demands that academic research move beyond theoretical innovation to actively inform policy development. This requires building stronger mechanisms for dialogue and collaboration between scholars and practitioners, ensuring that research agendas are responsive to emerging needs and that policy frameworks are grounded in the latest interdisciplinary insights. By prioritizing integrated analysis and cross-domain collaboration, the field can better address the complexity of twenty-first-century international relations and contribute to both academic advancement and evidence-based policymaking.

6. Limitations

This research has several limitations that should be acknowledged transparently. First, the qualitative methodology, while appropriate for the exploratory objectives of this study as argued by Schwartz-Shea and Yanow (2012), does not permit statistical generalization or hypothesis testing. The findings represent interpretive analysis based on available evidence and should be understood as provisional insights requiring further investigation through complementary methodological approaches. Second, the focus on four research domains necessarily excludes other areas where international relations scholarship may face significant gaps. Additional domains—such as space governance, pandemic preparedness, emerging financial technologies, or the governance of biotechnology—could have been included and may merit similar analysis.

Third, the analysis relies primarily on English-language literature and policy documents, potentially missing perspectives and evidence from non-English sources. This limitation is particularly relevant for the analysis of digital sovereignty in the Global South, where important scholarship and policy discourse may occur in French, Spanish, Portuguese, Arabic, Mandarin, and other languages. Fourth, the rapid pace of change in these domains means that some findings may become dated as new developments emerge. The research represents a snapshot of current knowledge gaps rather than a definitive statement of the research agenda for these domains. Fifth, the interpretivist approach adopted in this research involves subjectivity in coding, theme identification, and interpretation. While quality assurance measures were implemented following Lincoln and Guba's (1985) criteria, alternative interpretations of the evidence are possible. The findings should be understood as one analysis of research gaps that invites dialogue and complementary investigation rather than a comprehensive or definitive assessment.

7. Conclusions

In an era marked by rapid technological innovation, environmental uncertainty, and shifting geopolitical dynamics, the study of international relations faces unprecedented challenges. As artificial intelligence transforms the nature of strategic competition, climate change reshapes the contours of security and cooperation, digital sovereignty emerges as a central concern for developing nations, and hybrid warfare expands the role of non-state actors, traditional frameworks for understanding global affairs are increasingly insufficient. These developments demand new approaches to both academic research and policy analysis, approaches that are theoretically innovative, methodologically rigorous, and empirically grounded.

7.1. Summary of Findings

This research paper has presented a comprehensive qualitative analysis of research gaps in four critical domains of international relations scholarship. The analysis reveals that traditional theoretical frameworks—including realism as articulated by Waltz (1979/2010) and Mearsheimer (2001), liberalism as developed by Keohane (1984) and Ikenberry (2011), and constructivism as formulated by Wendt (1999) and Finnemore and Sikkink (1998)—face significant limitations in addressing the distinctive characteristics of these emerging challenges. These limitations concern fundamental concepts including power, agency, sovereignty, and the boundaries of the international system,

 doi:10.20944/preprints202603.0170.v2

suggesting the need for theoretical innovation rather than merely incremental extension of existing approaches.

Across all four domains, the analysis identifies specific research gaps that require attention. In AI governance, existing frameworks inadequately address how AI reshapes power distribution, alliance structures, and security dynamics, with particular gaps in understanding the role of technology corporations and the implications of export controls for alliance politics. In climate security, scholarship lacks robust frameworks linking environmental stress to interstate outcomes and understanding climate cooperation as a security-building mechanism, with insufficient attention to multi-level causal pathways and the securitization of climate discourse. In digital sovereignty, Western-centric theories fail to capture the perspectives and strategies of Global South countries navigating digital dependency, with important gaps in understanding digital non-alignment, digital colonialism, and the relationship between digital sovereignty and economic development. In hybrid warfare, frameworks understate the role of non-state actors and the challenges they pose for traditional concepts of deterrence, attribution, and international law, with insufficient typological and comparative analysis of state-non-state relationships in contemporary conflict.

The analysis also identifies important cross-domain interconnections, revealing that these four research areas interact in complex ways that demand integrated analytical approaches. The convergence of AI capabilities and hybrid warfare operations, the intersection of climate data governance with digital sovereignty concerns, and the ways in which climate stress creates conditions conducive to hybrid operations all illustrate the systemic nature of contemporary global challenges. Addressing these interconnections requires theoretical and methodological innovation that transcends the boundaries of individual research domains.

The field of international relations faces a critical moment in which established frameworks prove inadequate for emerging challenges while the need for evidence-based analysis has never been greater. The four research domains examined in this paper represent interconnected challenges that demand new analytical approaches. By pursuing the research directions outlined here—including the development of new theoretical frameworks, the adoption of interdisciplinary methodologies, and the creation of mechanisms for connecting scholarship to policy—scholars can contribute to both academic advancement and evidence-based policymaking in an increasingly complex international environment. The urgency of real-world implications, the potential for theoretical innovation, and the relevance for decision-makers all argue for prioritizing research in these domains. The challenges facing the international community in the twenty-first century require scholarship that is responsive to the pace and complexity of global change while maintaining the analytical rigor that is the hallmark of the discipline.

Looking ahead, the imperative for international relations scholarship is to not only recognize the multidimensionality of contemporary global issues but also to operationalize this understanding in research and policy practice. The synthesis of findings across artificial intelligence governance, climate security, digital sovereignty, and hybrid warfare demonstrates that discrete, siloed approaches are no longer sufficient. Instead, the field must embrace analytical models that are capable of capturing feedback loops, emergent behaviors, and multi-level interactions—features that increasingly characterize the international system.

To meet this challenge, scholars should invest in methodological pluralism and interdisciplinarity, drawing on insights from political science, computer science, environmental studies, law, and security studies. This approach will facilitate the development of robust frameworks capable of explaining and predicting the outcomes of complex phenomena such as the weaponization of data, the digital dependencies of developing countries, and the evolving tactics of non-state actors in hybrid conflicts. Moreover, it is vital to address issues related to data availability and quality, especially in domains governed by proprietary technologies or rapid policy innovation. Mixed-methods research, transparent reporting of limitations, and continuous adaptation to new empirical sources will be essential for maintaining analytical rigor.

 doi:10.20944/preprints202603.0170.v2

Furthermore, the relationship between academic research and policy formulation must be strengthened. As the urgency of challenges such as cyberattack attribution, climate migration governance, and digital infrastructure resilience grows, there is a pressing need for scholarship to inform and guide real-world decision-making. This entails fostering stronger partnerships between researchers and practitioners, designing mechanisms for regular dialogue, and ensuring that research agendas remain responsive to evolving policy needs. By prioritizing cross-domain collaboration and integrated analysis, the discipline can enhance its relevance and impact amid the complexity of twenty-first-century international relations.

Ultimately, the advancement of international relations as a field hinge on its ability to adapt to changing global realities. Theoretical innovation, methodological rigor, and a commitment to evidence-based analysis will position scholars to address the multifaceted challenges outlined in this research. By embracing diversity in perspectives—including those from the Global South—and investing in shared data infrastructure, the discipline can contribute meaningfully to both academic progress and the development of effective policy solutions. The stakes are high, and the opportunities for impactful research have never been greater.

8. Recommendations for Future Research

Based on the comprehensive analysis presented in this paper, several recommendations emerge for advancing international relations scholarship in these domains.

First, the academic community should prioritize the development of new theoretical frameworks that can accommodate the complexities identified in this analysis. Such frameworks must address the nature of power in an era of technological transformation, building upon but extending the work of Nye (2011) and Farrell and Newman (2019); the role of non-state actors in international relations, extending frameworks developed by Avant (2005) and Kaldor (2012); the integration of domestic and international levels of analysis, moving beyond Putnam's (1988) two-level games to capture the digital and environmental dimensions of domestic-international linkages; and the implications of environmental change for international order, developing the climate-security nexus beyond the foundations laid by Homer-Dixon (1999) and Barnett (2003). Theoretical innovation should be recognized and rewarded in academic evaluation systems through expanded criteria that value conceptual contributions alongside empirical findings.

Second, interdisciplinary research should be actively promoted through funding mechanisms, institutional structures, and recognition systems. Research on AI governance should bring together political scientists, computer scientists, ethicists, and legal scholars. Climate security research requires collaboration between environmental scientists, economists, and security specialists. Digital sovereignty scholarship should involve technologists, legal experts, and development specialists alongside international relations scholars. Hybrid warfare research must integrate military affairs, cyber security, media studies, and political communication. Academic institutions should create structures that facilitate and reward such interdisciplinary collaboration, including joint appointments, interdisciplinary research centers, and cross-departmental graduate programs.

Third, improved mechanisms for connecting academic research to policy needs should be developed. These mechanisms might include funding programs specifically for policy-relevant research, regular forums for engagement between researchers and policymakers, and recognition of policy impact in academic evaluation. Research outputs should be communicated in formats accessible to policy audiences, including policy briefs, executive summaries, and direct engagement with government and international organization officials. The goal should be to ensure that scholarly analysis informs policy decisions in these critical domains while maintaining academic independence and rigor.

Fourth, data infrastructure should be developed to support research in these domains. Shared datasets on AI capabilities, climate stress indicators, digital policies, and hybrid warfare incidents would enable comparative research and enhance the rigor of analysis. Such infrastructure requires investment from funding agencies, collaboration among research institutions, and attention to ethical

 doi:10.20944/preprints202603.0170.v2

considerations around data collection and sharing. The development of such infrastructure should be a priority for the international relations research community, potentially through initiatives coordinated by professional associations or international research networks.

Fifth, greater attention should be devoted to perspectives and scholarship from the Global South, following the call articulated by Acharya (2014) for a more globally representative discipline. The analysis of digital sovereignty revealed the limitations of Western-centric approaches and the value of engaging with non-Western perspectives. Research agendas should be developed in consultation with scholars and policymakers from diverse regions, and efforts should be made to include perspectives that dominant theoretical frameworks have historically marginalized. This inclusivity will enhance both the validity of research findings and the relevance of scholarship to global policy challenges.

Table 12. Summary of Recommendations and Implementation Strategies.

Recommendation	Implementation Strategy	Expected Outcome	Key Stakeholders
Develop new theoretical frameworks	Dedicated theory-building workshops, special journal issues	Updated conceptual tools for emerging challenges	Academic scholars, journal editors
Promote interdisciplinary research	Joint funding programs, cross-departmental centers	Integrated analysis across disciplinary boundaries	Universities, funding agencies
Connect research to policy	Regular researcher-policymaker forums, policy briefs	Better informed policy decisions	Academics, government officials, IOs
Build data infrastructure	Shared datasets, collaborative data collection	Enhanced comparative research capacity	Research institutions, professional associations
Include Global South perspectives	Inclusive research agendas, multilingual scholarship	Globally representative and valid scholarship	Global academic community, regional institutions
Adopt mixed-methods approaches	Methodological training, collaborative research designs	More robust and comprehensive findings	Graduate programs, research teams
Examine cross-domain interconnections	Integrated research programs, systems approaches	Understanding of systemic global challenges	Interdisciplinary research centers

Source: Author's compilation based on the analysis and findings presented in this study.

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The recommendations outlined above underscore the necessity for a fundamental shift in the way international relations scholarship approaches emerging global challenges. As the boundaries between technology, environment, security, and sovereignty become increasingly blurred, it is imperative that future research moves beyond siloed investigations and embraces a holistic, systems-oriented perspective. This transition will require not only the adoption of new analytical tools and frameworks but also a reconfiguration of institutional practices that shape the production and dissemination of knowledge.

A critical aspect of this transition involves fostering sustained dialogue between researchers and practitioners. By strengthening the feedback loop between academic analysis and policy implementation, the field can ensure that theoretical advances are informed by real-world needs and that policy solutions are grounded in rigorous evidence. This approach will be particularly salient in domains such as AI governance, where the pace of technological innovation often outstrips the capacity of traditional policy frameworks, and in climate security, where the urgency of environmental threats demands actionable insights.

Furthermore, the call for greater inclusion of Global South perspectives highlights the importance of epistemic diversity in the study of international relations. Engaging with scholars, policymakers, and practitioners from a wider range of cultural, economic, and political contexts will help to uncover novel causal mechanisms, challenge entrenched assumptions, and enhance the global validity of research findings. This inclusivity is not only an ethical imperative but also a practical one, as the dynamics of digital sovereignty, hybrid warfare, and climate stress are experienced differently across regions.

Moving forward, discipline should also prioritize methodological innovation. Mixed-methods approaches, systems modeling, and comparative case studies offer pathways for capturing the complexity of contemporary international phenomena. Investment in robust data infrastructure will further support these methodological advances, enabling scholars to draw on high-quality, diverse datasets and facilitating cross-domain analysis. Such infrastructure will be essential for generating insights that are both empirically grounded and theoretically meaningful.

Finally, implementation of these recommendations will depend on the collective action of key stakeholders—academic institutions, funding bodies, professional associations, and policy organizations. By aligning incentives, resources, and evaluation criteria with the goal of advancing interdisciplinary, inclusive, and policy-relevant research, the international relations community can rise to the challenge of addressing twenty-first-century global complexities. The stakes are high, but the potential for transformative impact is equally significant.

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