The Dominance of Technical and Scientific Experts in Shaping Technopolitics in International Relations

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Abstract
This paper argues that technical and scientific experts are the most influential actors in shaping technopolitics within international relations, surpassing the roles of politicians, individuals, and other actors. It explores two primary approaches to technopolitics centralized and decentralized and examines the impact of scientific expertise through case studies on nuclear weapons and geoengineering. The analysis demonstrates how scientific and technical experts influence the direction of technological advancements, providing the tools and knowledge that politicians and individuals use to pursue political objectives. The study concludes that scientists and technical experts play a central role in the shaping of techno-politics, especially when balancing state control and public participation.
Keywords: Technology, Scientific Experts, International Relations, Politics

Introduction
Technopolitics, the intersection of technology and political influence, has long been debated within the context of international relations. The debate centers on identifying the most powerful actors in this dynamic: politicians and decision-makers, who are seen as the central players in international politics, or most individuals, whose activities and opinions often influence political landscapes. This paper contends that technical and scientific experts, with their role as creators and innovators, exert the most substantial influence on techno-politics. This argument is explored by comparing the influence of politicians and scientists in two critical case studies: nuclear weapons and geoengineering in the context of climate change.

Conceptualizing Techno Politics: Centralized and Decentralized Approaches
Techno-politics operates on two levels: technology innovation and political intervention (Kurban, Peña-López, & Haberer, 2017). It refers to applying technological developments to achieve political objectives, with the internet being a prominent example. Two major approaches are identified: the centralized and decentralized approaches.

The centralized approach involves the state or government leveraging technology for traditional political purposes, such as the development of e-government and e-politics (Mitchell, 2002; Dunleavy & Margetts, 2006). This approach enables governments to consolidate power through surveillance, data collection, and control over communication channels, aligning technological progress with state interests.

In contrast, the decentralized approach emphasizes grassroots participation, with technology empowering individuals to share information and influence political affairs. The rise of digital platforms and social media has democratized access to information, enabling people to engage politically, increase public participation, and raise awareness on issues such as human rights and climate change. This form of techno politics is often referred to as democratic techno-politics (Kurban, 2017), where individuals use the internet to organize protests, lobby for political change, or raise awareness about pressing global issues.

From these perspectives, techno-politics has implications for both centralizing and decentralizing power. While states may exploit technology to strengthen control and achieve national interests, individuals often seek to leverage technological tools to challenge authority and advocate for democratic values.

The Role of Technical and Scientific Experts in Technopolitics
Technical and scientific experts play a pivotal role in shaping both centralized and decentralized technopolitical frameworks. These experts are the architects of technological innovations that enable both state control and public participation. The role of scientific expertise has been fundamental in the development of new technologies, from the internet to nuclear weapons, which are subsequently used to further political agendas.

For instance, the development of nuclear weapons during the Cold War exemplifies how scientific knowledge is crucial to the establishment of military power. While political leaders control the use and deployment of nuclear weapons, they rely on the expertise of scientists to develop the technology. This power dynamic is evident in the geopolitical negotiations between nuclear-armed states, where technological superiority provides leverage in international relations.

In the case of geoengineering and climate change, scientific expertise also plays a central role in formulating potential solutions to global challenges. Scientists are at the forefront of proposing and developing geoengineering technologies, yet their innovations are shaped by political considerations. Politicians, while not involved in the technical details, depend on scientists to provide the data, tools, and strategies to address complex environmental issues.

Case Study 1: Nuclear Weapons and Technopolitics
The development of nuclear weapons underscores the influence of scientific and technical experts in shaping global power dynamics. As of the latest data, nine countries possess nuclear weapons, including the United States, Russia, and China. During the Cold War, the U.S. and Soviet Union stockpiled tens of thousands of nuclear warheads, with each side seeking technological superiority (Norris & Kristensen, 2010). This technological race was not merely about military strategy but also about asserting power in international negotiations, where nuclear capabilities were seen as symbols of national strength.

However, scholars like Rose Gottemoeller (2021) and Roland (2010) argue that the accumulation of nuclear warheads increases the risk of an arms race and global instability. While politicians are the ones who decide whether to deploy these weapons, scientists are the key figures responsible for their invention and technological advancement. The development of nuclear technology, including enrichment facilities and the theoretical underpinnings of weaponization, is inherently dependent on scientific expertise.

Additionally, political treaties, such as the Atmospheric Test Ban Treaty of 1963, restricted scientists' ability to conduct nuclear tests, showing the tension between scientific knowledge and political control (Masco, 2006). While politicians may regulate scientific practices, they are ultimately dependent on scientists to provide the knowledge and technology that shape global power structures.

Case Study 2: Geoengineering and Climate Change
Geoengineering, first introduced as a potential solution to climate change in 1965 by U.S. President Lyndon Johnson, is another area where scientific expertise plays a decisive role (Victor, Morgan, Apt, & Steunbrune, 2013). The development of geoengineering technologies, such as solar radiation management and carbon dioxide removal, presents both technical challenges and political dilemmas. While geoengineering is proposed as a potential solution to mitigate climate change, scholars like Corry (2017) caution that it may merely serve as a band-aid, diverting attention from the need to reduce greenhouse gas emissions.

Scientific experts are integral to the development and testing of geoengineering technologies, yet their work is often shaped by political agendas. For instance, reforestation and carbon capture technologies require significant government funding and political will to implement effectively. The interaction between states and scientists in the realm of geoengineering highlights the tension between political control and scientific autonomy.

Scholars like Allan (2017) and Lindskog & Sundqvist (2015) emphasize the need for cooperation between states and scientists to address climate change. While scientists can provide the technical expertise needed to develop and implement geoengineering solutions, political leaders hold the power to allocate resources and set priorities. This collaboration between scientists and politicians illustrates the central role of scientific knowledge in shaping global governance structures and techno-politics.

Conclusion
In both the cases of nuclear weapons and geoengineering, scientific and technical experts are the key actors driving technologecal innovation and, by extension, shaping techno politics in international relations. While politicians may use these technologies to further political agendas—whether for centralizing power or addressing global challenges—they are ultimately dependent on scientists to develop the necessary tools and knowledge. Through their role as creators and innovators, scientists hold the unique position of shaping the very technologies that define the political landscape. Therefore, it is reasonable to conclude that technical and scientific experts are the most powerful actors in influencing techno politics within international relations.

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