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GOVERNANCE APPROACHES TO MANAGING RISK IN THE ANTHROPOCENE: SUSTAINABILITY AND DECISION-MAKING

MÁRCIO EDUARDO GARCIA BEZERRA

MARINA DANTAS DE FIGUEIREDO
UNIVERSIDADE DE FORTALEZA - UNIFOR

CORA FRANKLINA DO CARMO FURTADO
UNIVERSIDADE ESTADUAL DO CEARÁ

Resumo

From the mid-twentieth century onwards, intensified human activity has profoundly transformed the Earth System, disrupting the environmental balance that supported the development of diverse human civilizations. The Anthropocene, proposed as a new geological epoch, signifies that our planet is now on an unprecedented path, provoking widespread curiosity and concern regarding the current and future state of nature. This new zeitgeist reflects a growing awareness in the scientific community of the urgent need for governance mechanisms that can maintain safe conditions for life on Earth (Lorimer, 2016). Within academic and political spheres (Steffen et al., 2015; Rockström et al., 2009; Raworth, 2017; Klein, 2019), there is a consensus that we have surpassed the sustainable limits of natural resource exploitation, necessitating radical shifts toward energy transitions and reduced consumption. These shifts are not only overdue but also crucial for avoiding catastrophic ecological scenarios, especially for vulnerable social groups most affected by climate change. Addressing these challenges requires comprehensive governance strategies that integrate diverse political, epistemological, and ethical perspectives to establish priorities and action plans that can effectively manage both current and emerging risks. The financial sector plays a critical role in fostering sustainable futures by supporting corporate endeavors that contribute to biosphere resilience, as highlighted by Crona et al. (2021). Their research investigates the intersection of financial services and the imperative for sustainability in the Anthropocene era, underscoring the need for transformative change in sustainable finance. Current financial risk frameworks, often focused on financial materiality and sector-specific risks, may inadvertently overlook the broader impacts of investment externalities, exacerbating climate and environmental changes. This oversight highlights a cognitive disconnect within financial risk frameworks regarding ecological considerations, underscoring the importance of closing the cognitive risk loop to better assess and mitigate systemic risks. Technological and financial risks pose critical questions for governance: How can decision-makers act ethically when knowledge about potential consequences is incomplete? The global interconnectedness of technology, financial networks, trade, and environmental impacts means that localized events can now have widespread repercussions (Beck, 2011). Consequently, the perception of reaching an irreversible ecological tipping point may drive precautionary attitudes that are more about managing public perception than committing to substantive risk mitigation. The concept of ‘absolute sustainability’ suggests the need for a more comprehensive approach to risk assessment, integrating both environmental and financial considerations to reflect the true risks associated with economic activities (Amosh, 2024). In the context of a risk society (Beck, 2011), it is vital to distinguish between precaution driven by information availability and genuine governance commitments to mitigate risks and promote sustainability. While catastrophic scenarios can shape public opinion and influence policy, they can also impose unnecessary restrictions on innovations

that could help avert greater ecological harm. Effective governance should balance caution with the potential benefits of technological advancements and ensure that financial frameworks encompass environmental considerations and investment externalities. The Anthropocene challenges us to rethink governance in light of its social, ecological, and planetary implications, particularly concerning concepts like development, capitalism, and modernity (Lorimer, 2017). This paper aims to explore the feedback processes of the Anthropocene, specifically examining how expanding technological and financial frontiers can mitigate risks but also create new forms of environmental degradation. By analyzing technological advances in the energy and agriculture sectors, as well as financial frameworks, we investigate the extent to which these innovations contribute to a cycle of risk that exacerbates pressure on Earth's regenerative capacities.

Palavras Chave
Risk, Governance, Anthropocene

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1 INTRODUCTION

From the mid-twentieth century onwards, intensified human activity has profoundly transformed the Earth System, disrupting the environmental balance that supported the development of diverse human civilizations. The Anthropocene, proposed as a new geological epoch, signifies that our planet is now on an unprecedented path, provoking widespread curiosity and concern regarding the current and future state of nature. This new zeitgeist reflects a growing awareness in the scientific community of the urgent need for governance mechanisms that can maintain safe conditions for life on Earth (Lorimer, 2016).

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The financial sector plays a critical role in fostering sustainable futures by supporting corporate endeavors that contribute to biosphere resilience, as highlighted by Crona et al. (2021). Their research investigates the intersection of financial services and the imperative for sustainability in the Anthropocene era, underscoring the need for transformative change in sustainable finance. Current financial risk frameworks, often focused on financial materiality and sector-specific risks, may inadvertently overlook the broader impacts of investment externalities, exacerbating climate and environmental changes. This oversight highlights a cognitive disconnect within financial risk frameworks regarding ecological considerations, underscoring the importance of closing the cognitive risk loop to better assess and mitigate systemic risks.

Technological and financial risks pose critical questions for governance: How can decision-makers act ethically when knowledge about potential consequences is incomplete? The global interconnectedness of technology, financial networks, trade, and environmental impacts means that localized events can now have widespread repercussions (Beck, 2011). Consequently, the perception of reaching an irreversible ecological tipping point may drive precautionary attitudes that are more about managing public perception than committing to substantive risk mitigation. The concept of ‘absolute sustainability’ suggests the need for a more comprehensive approach to risk assessment, integrating both environmental and financial considerations to reflect the true risks associated with economic activities (Amosh, 2024).

In the context of a risk society (Beck, 2011), it is vital to distinguish between precaution driven by information availability and genuine governance commitments to mitigate risks and promote sustainability. While catastrophic scenarios can shape public opinion and influence policy, they can also impose unnecessary restrictions on innovations that could help avert greater ecological harm. Effective governance should balance caution with the potential benefits of technological advancements and ensure that financial frameworks encompass environmental considerations and investment externalities.

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mitigate risks but also create new forms of environmental degradation. By analyzing technological advances in the energy and agriculture sectors, as well as financial frameworks, we investigate the extent to which these innovations contribute to a cycle of risk that exacerbates pressure on Earth's regenerative capacities.

2 THE RISK IN THE ANTHROPOCENE

The scientific trajectory of the Anthropocene concept has been profoundly influenced by the systemic perspective, which views Earth as a unified entity subject to a complex interplay of geological, atmospheric, and social forces. This perspective, advocating for the possibility of system adjustments toward self-regulation, finds roots in Lovelock's Gaia Hypothesis (1974) and aims at managing these forces within minimum safety standards. The systemic view has been instrumental in understanding the planet's dynamic interactions, highlighting the interdependence of various environmental processes and human activities.

Traditionally, the systemic perspective has been normative, treating risk as an objective, measurable phenomenon that scientific knowledge can control (Gephart et al., 2009). In Earth System Sciences, human impacts on the planet have been framed within the concept of planetary boundaries (Rockström et al., 2009). These boundaries delineate three risk zones: the safe operating zone, where human activities maintain stable environmental conditions; the uncertainty zone, where conditions are less predictable; and the risk zones, where Earth System processes have moved beyond Holocene norms, threatening the stability necessary for sustaining human life. Notably, Rockström et al. (2009) identified that three out of nine planetary boundaries—climate change, biodiversity loss, and nitrogen cycle alterations—have already been breached, exacerbating pressure on other boundaries due to their interdependence.

The "Great Acceleration" thesis (Steffen, Crutzer, and McNeill, 2007; Steffen et al., 2015) further illustrates the intensity of these changes. It links the surge in population growth, industrialization, and consumption since the mid-twentieth century to the Anthropocene's defining changes. This acceleration began around 1945/50, marking a period of rapid and widespread transformation in human-environment relationships, driven by increased resource demand and elevated living standards, particularly in developed nations.

Al Amosh (2024) extends this understanding by examining the role of financial risk within the framework of sustainability. The current sustainability frameworks, such as the Task Force on Climate-related Financial Disclosures (TCFD), capture some environmental impacts but lack a nuanced assessment of their nature and magnitude. The concept of 'absolute sustainability' proposed by Chrona et al. (2021) underscores the need to close the cognitive risk loop in financial frameworks, advocating for a more comprehensive assessment of systemic risks. This approach highlights that financial services play a critical role in addressing Anthropocene challenges by integrating environmental considerations and investment externalities into risk assessment.

Existing financial risk frameworks often focus narrowly on financial materiality, potentially overlooking broader ecological impacts. This cognitive disconnect can exacerbate climate and environmental changes, undermining sustainable finance initiatives. Chrona et al. (2021) argues for a paradigm shift in financial risk frameworks to encompass a more holistic view of sustainability, including long-term resilience of investments and their impacts on ecosystems, communities, and future generations. By evaluating environmental, social, and governance ratings and global green investments, the study advocates for a reevaluation of risk frameworks to reflect the true risks associated with economic activities.

In light of these insights, decision-making in the Anthropocene must navigate a continuum between precautionary principles—aiming to avoid new risks—and the development of innovations designed to address existing environmental challenges. This

cyclical process, driven by technological advancements and associated risks, underscores the need for a balanced approach that integrates both innovation and risk management to sustain environmental stability and resilience (Beck, 2011).

2.1 THE PRECAUTIONARY APPROACH

In the face of planetary boundaries, a specific view of risk highlights that what we call development is an accumulation of technologies, endorsed by scientific consensus, which can no longer guarantee the safety of the organizations operating them, let alone the broader societal impact. This perspective aligns with the contemporary "risk society" concept (Beck, 2011), characterized by environmental dangers and insecurities resulting from modernization, demanding a precautionary approach to manage these risks (Lieber and Romano-Lieber, 2005).

Technological risks are those unforeseen effects or potential fatalities that cannot be controlled by the same technical solutions that created them and may have unpredictable consequences (Mariconda, 2014, p. 91). These consequences affect society in an uncertain scenario where implications and results are not always known in advance and cannot be fully measured. In response, precautionary measures are intended to prevent or mitigate harmful effects from technological innovations. These measures should be ethically appropriate and involve identifying potential harmful effects, mechanisms leading to their occurrence, and developing strategies to prevent or reduce their impact through robust regulations (Lacey, 2019, p. 257).

Within this framework, the financial sector plays a crucial role in supporting a precautionary attitude towards organizational risks. Financial institutions can integrate precautionary principles into their risk management practices by emphasizing long-term sustainability and resilience. This involves assessing not only the immediate financial returns but also the broader environmental and social implications of investments. By incorporating environmental, social, and governance (ESG) criteria into investment decisions, financial institutions can help prevent or mitigate the adverse impacts of technological advancements.

The adoption of comprehensive risk frameworks, such as those advocated by Al Amosh (2024), can further support precautionary measures. These frameworks should address the limitations of current models, which often focus narrowly on financial materiality and overlook broader ecological impacts. By closing the cognitive risk loop and integrating environmental considerations and investment externalities, financial institutions can better assess and mitigate systemic risks associated with technological advances.

Risk society awareness underscores the need for a paradigm shift towards precaution, guided by safe planetary boundaries (Rockström et al., 2009; Steffen et al., 2015). This shift requires financial institutions to move beyond traditional risk assessments and embrace a holistic view that considers the long-term environmental and societal impacts of their investments. As Beck (2011) notes, the continuous generation of new risks through technological advancements creates a self-perpetuating cycle of risk and economy. Financial institutions can counteract this by promoting investments in sustainable technologies and practices that align with precautionary principles.

Furthermore, the precautionary approach enhances the role of experts and financial institutions in shaping public policy and guiding organizational behavior. By leveraging their influence, financial institutions can advocate for stronger regulations and standards that prioritize environmental and social sustainability.

It is also important to recognize that risks are often unequally distributed, with affluent societies minimizing their exposure while exploiting less developed regions (Curran, 2013, p. 52; Banerjee, 2003). Financial institutions have a responsibility to address these disparities by supporting initiatives that reduce risk and enhance resilience in vulnerable communities.

Overall, the financial sector's support for a precautionary attitude involves integrating environmental and social considerations into risk management, advocating for regulatory improvements, and promoting investments that contribute to a sustainable future. By doing so, financial institutions can help mitigate the adverse effects of technological advances and contribute to a more resilient and equitable global society.

2.2 THE EMPASIS ON TECHNOLOGICAL POTENTITIAL

The idea that organizations, governments, scientists, and institutions should be risk-aware, as highlighted by the precautionary principle, faces criticism in Sunstein's (2003) analysis. Sunstein argues that precaution, while crucial, is often vague and needs to be connected to clear risk perceptions and actionable prevention measures to be effective. This pursuit of objectivity in risk management can sometimes create a misleading sense of clarity, potentially obscuring the complex reality of risk.

On the other hand, extending caution can lead to inaction, as individuals and organizations might prefer to avoid risks rather than taking potential gains. The phrase "better safe than sorry" encapsulates this tendency, where the fear of unknown future risks can overshadow immediate needs and actions. While those who endorse the precautionary principle aim to protect against future risks, this can inadvertently lead to neglecting the needs of those already facing significant challenges and imposing unrealistic demands on risk regulators (Sunstein, 2003, p. 1011).

The precautionary attitude emphasizes the inherent uncertainty and the limitations of fully understanding the consequences of decisions. Politically, the principle shifts the burden of proof onto those proposing potentially harmful actions, requiring them to demonstrate safety before proceeding (Kahneman, 2011, p. 439). In the context of modern technological progress, this precautionary approach can sometimes be perceived as supporting the regulation of technological potential rather than actively seeking solutions to existing risks.

However, in a view that emphasizes technological potential, it becomes crucial to integrate precaution with efforts that go beyond mere prevention to include mitigation and reparative actions. The financial sector has a significant role in this integration by supporting and financing technologies that address both current and future risks. Financial institutions can help bridge the gap between precaution and action by investing in technologies that not only prevent further damage but also repair existing environmental harm. This support includes funding for innovations that align with both sustainability goals and practical solutions for mitigating the impacts of the Anthropocene.

From a governance perspective, this financial support should be expressed through frameworks that incorporate precautionary principles into risk management and investment strategies. Governance models can be enhanced by integrating environmental, social, and governance (ESG) criteria, promoting investments that address systemic risks and support reparative technologies. This approach requires a shift from traditional financial risk assessments to a more holistic view that considers the long-term impacts of investments on planetary boundaries.

For instance, adopting frameworks can guide financial institutions in evaluating the full spectrum of risks, including ecological and social impacts. These frameworks advocate for closing the cognitive risk loop by incorporating environmental considerations and investment externalities into risk assessments. By doing so, financial institutions can better support efforts to address both preventive and remedial actions, ensuring that technological advancements contribute to a sustainable future.

Furthermore, governance frameworks should include mechanisms for accountability and transparency in how financial institutions support precautionary and reparative measures.

This involves developing impact accounting systems that track the environmental and social outcomes of investments, ensuring that technologies not only avoid further harm but actively contribute to repairing ecological systems and supporting vulnerable communities.

In summary, integrating precaution with efforts to address both prevention and repair requires a collaborative approach between the financial sector and governance frameworks. Financial institutions can play a pivotal role by investing in sustainable technologies and supporting governance models that prioritize long-term resilience and environmental justice. This comprehensive approach helps to balance the potential of technology with the imperative to mitigate and repair the damage already done, aligning with the principles of precaution and sustainability.

3 FINAL CONSIDERATIONS

While the precautionary attitude aims to prevent or delay innovations that may potentially improve human living conditions, it is equally crucial to critically examine its opposite: an attitude that embraces technological risk in pursuit of potential gains, despite social and environmental costs. This perspective suggests that optimism, even if somewhat idealistic, might be justified if action is deemed necessary (Kahneman, 2011, p. 320). However, the immediacy of risk, compounded by modernity, can sometimes create shortcuts around moral and ethical questions concerning the intensified use of technology and its broader consequences.

The procedural and circular nature of technology contributing to the Anthropocene is evident in the modernist eco-movement's ideology (Malhi, 2017). This movement often fails to address the connections between environmental destruction and the fundamental practices of capitalist modernity and development (Lorimer, 2017, p. 124). Such an approach underscores the need for a balanced perspective that integrates precautionary measures with efforts to mitigate and repair environmental damage, rather than solely focusing on potential technological gains.

In this context, the role of the financial sector becomes paramount. Financial institutions have the power to support a precautionary attitude by investing in technologies that not only prevent further environmental harm but also contribute to repairing existing damage. By adopting governance frameworks that incorporate environmental, social, and governance (ESG) criteria, financial institutions can help ensure that technological advancements align with broader sustainability goals. This involves moving beyond traditional risk assessments to consider the long-term impacts of investments on planetary boundaries.

Ultimately, integrating precaution with proactive measures in risk management requires a comprehensive approach that balances innovation with responsibility. Governance frameworks should facilitate this balance by promoting transparency and accountability in financial investments, ensuring that both preventive and reparative actions are taken into account. Such a holistic approach helps to align technological potential with the imperative to address environmental and social challenges, contributing to a more sustainable and resilient future.

REFERENCES

Al Amosh, H. (2024). The Anthropocene reality of financial risk. *Social and Environmental Accountability Journal*, *44*(1), 85-86.

Asafu-Adjaye, J., Blomqvist, L., Brand, S., Brook, B., Defries, R., Ellis, E., … Shellenberger, M. (2015): An ECOMODERNIST Manifesto. Oakland: Breakthrough Institute, 31.

Beck, U. (2011): Sociedade de Risco: Rumo a uma outra modernidade. São Paulo: Editora 34.

Castree, N., Adams, W.M., Barry, J., Brockington, D., Büscher, B., Corbera, E., Demeritt, D.,

Duffy, R., Felt, U., Neves, K., Newelll, P. (2014): Changing the intellectual climate. Nature climate change, 4(9), 763-768.
Crona, B., Folke, C., & Galaz, V. (2021). The Anthropocene reality of financial risk. *One Earth*, *4*(5), 618-628.
Curran, D. (2013): Risk society and the distribution of bads: Theorizing class in the risk society. British Journal of Sociology, 64(1), 44–62. Gephart, R. P., Van Maanen, J., & Oberlechner, T. (2009): Organizations and Risk in Late Modernity. Organization Studies, 30(2–3), 141–155.
Hamilton, C. (2015): Getting the Anthropocene so wrong. The Anthropocene Review, 2(2),102–107.
Kahneman, D. (2011): Rápido e Devagar: Duas Formas de Pensar. Rio de Janeiro: Objetiva
Klein, N. (2019): On Fire: The Burning Case for a Green New Deal. Great Britain: Alen Lane.
Lacey, H. (2019): Adoção de medidas de precaução diante dos riscos no uso das inovações tecnocientíficas. Estudos Avançados, 33(95), 245–258.
Leiber, R. R., & Romano-Lieber, N. S. (2005): Risco e precaução no desastre tecnológico. Cadernos Saúde Coletiva, 13(1), 67–84
Lorimer, J. (2017): The Anthropo-scene: A guide for the perplexed. Social Studies of Science, 47(1), 117-142.
Malhi, Y. (2017): The concept of the Anthropocene. Annual Review of Environment and Resources, 42, 77-104.
Mariconda, P. R. (2014): Technological risks, transgenic agriculture and alternatives. Scientiae Studia, 12(spe), 75–104.
Power, M. (2014): Risk, Social Theories, and Organizations. In: Adler P., Gay P. Du, Morgan G., & Reed M (eds): The Oxford Handbook of Sociology, Social Theory, and Organization Studies. Oxford University Press, 1–29.
Raworth, K. (2017): Doughnut economics: seven ways to think like a 21st-century economist. Chelsea Green Publishing. Rockström, J., W. Steffen, K. Noone, Å.…, P. Crutzen, J.A. Foley (2009): Planetary Boundaries: Exploring the Safe Operating Space for Humanity Johan. Ecology and Society, 14(2).
Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., & Ludwig, C. (2015): The trajectory of the Anthropocene: The Great Acceleration. The Anthropocene Review, 2(1), 81–98. Steffen, W., Crutzen, P. J., & McNeill, J. R. (2007): The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature. AMBIO: A Journal of the Human Environment, 36(8), 614–621.
Steffen, W., Richardson, K., Rockstrom, J., Cornell, S. E., Fetzer, I., … Sorlin, S. (2015): Planetary boundaries: Guiding human development on a changing planet. Science, 347(6223).
Sunstein, C. R. (2003): Beyond the precautionary principle. University of Pennsylvania Law Review, 151(3), 1003-1058