Task Force 05
INCLUSIVE DIGITAL TRANSFORMATION

Regulatory sandboxes as a mechanism for achieving SDGs

Noha Lea Halim, TUM ThinkTank (Germany)

Christiane Perrone, Institute for Technology and Society (ITS Rio, Brazil)

Armando Guio Español, Global Network for Internet & Society Centers; BKC (Colombia)

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Abstract

This policy brief explores how regulatory sandboxes are governance mechanisms to achieve Sustainable Development Goals (SDGs) at a global scale. Sandboxes serve as controlled environments that allow the testing and developing of emerging technologies within clear predetermined boundaries, aligning the promotion of innovation and protection of rights. The topic of regulatory sandboxes appeared previously within the G20, yet its emphasis was on financial services. The advances in developing new technologies, such as artificial intelligence (AI), provide an opportunity for a wider global discussion of the mechanism as a tool for achieving SDGs. Emphasizing the importance of interoperability, this paper will explore how sandboxes across borders lead to greater collaborative efforts, common standards for data, consumer protection and ethical considerations in emerging technologies. Sandboxes, thus, can promote sustainable industrialization by allowing countries to test innovative technologies, capable of reducing CO2 emissions or introducing green technologies that aim at environmental goals. Through evidence-based analysis, this brief showcases how different countries develop sandboxes, considering cultural, legal, and economic factors, to uncover best practices, challenges, and opportunities as well as their compatibility and robustness *vis-a-vis* different governance frameworks.

Keywords: Sandbox, AI, SDGs, Sustainability, Cross-Border Collaboration

Diagnosis of the Issue

Sandboxes are controlled environments that allow testing and developing of emerging technologies within clear predetermined boundaries (International Bank for Reconstruction and Developmen, 2020). Their ability to facilitate experimentation is crucial in times of rapid technological development. Implementing new measures necessitates constant experimentation and continuous learning by policymakers.

The previous G20 discussions on sandboxes focused particularly on financial services (Koreen et al, 2018), yet the current stage is set for a broader evaluation of sandboxes, now in terms of artificial intelligence (AI).

This brief focuses on how policy makers can apply design thinking of regulatory AI sandboxes for achieving SDGs. The brief will have CO2 emissions (green technology), and health-based technology development as running examples of the potential for achieving Sustainable Development Goals (SDGs)[1]. Surveying these examples, the effort will guide us in drafting three recommendations for regulatory sandboxes: firstly, to design regulatory sandboxes that are applicable across borders; secondly, to implement supportive regulatory principles enforced by a task force; and thirdly, to establish criteria for their application.

The intersection of AI and SDGs is critical. The broad applicability of AI across the 17 SDGs highlights the need for governance methodologies that embrace technology's potential while addressing its challenges. This complexity is relevant to the G20 agenda, emphasizing sustainable innovation within responsible governance frameworks.

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[1] "Sandboxes for Data Governance: Global Responsible Innovation | IGF 2023 WS #279 | Digital Watch Observatory," Digital Watch Observatory, last modified October 10, 2023, ttps://dig.watch/event/internet-governance-forum- 2023/sandboxes-for-data-governance-global-responsible-innovation-igf-2023-ws-279

The potential for AI to help achieve SDGs is not new. SDGs were designed to integrate economic, social and environmental dimensions of sustainability (Mazzi and Floridi, 2023), having space for technology to either directly support its achievement or for measuring its progress and alternatives. Implementing AI to achieve SDGs continues to be challenging, largely influenced by the methodologies of governance (*Ibidem:* 12). The overall 17 SDGs and their 169 associated targets are co-dependent as they rely on collaboration between industry, academia, civil society and government and will include multiple layers from international, national and regional scales.

Achieving SDGs transcends individual governments' capacities, necessitating a unified global response. Crucial to such collaboration is establishing interoperable regulatory frameworks. Legal interoperability, the harmonization of legal and regulatory frameworks across jurisdictions and sectors, ensures global standards do not obstruct SDG progress (Halim and Gasser, 2023) This is vital for creating testbeds sensitive to diverse cultural, legal, and economic contexts. To avoid conflicts from emerging norms, cross-border experimental approaches like regulatory sandboxes are vital governance mechanisms, enabling policymakers to exchange insights and collaboratively shape best practices at the AI and SDG intersection. Such efforts ensure coherent, complementary, and inclusive global challenges' responses.

Recommendations

Based on the aforementioned considerations, we want to make the following recommendations: i) disseminate regulatory sandboxes to different jurisdictions as a mechanism for achieving SDGs; ii) discuss and outline optimal regulatory principles that would support harmonized and standardized regulatory sandbox practices; and iii) develop a strategic and coordinated agenda for regulatory sandbox implementation.

1. Disseminate regulatory sandboxes across various jurisdictions as a mechanism for achieving Sustainable Development Goals (SDGs)

Sandboxes of AI are yet to be widely deployed globally. At the same time, frontier technologies such as GenAI that hold potential for addressing the realization of SDGs are not brought into connection to their potential outcomes, due to legal and ethical uncertainty and diverse, fragmented standards and regulatory norms. Sandboxes could allow for a way to bridge the challenges of safe spaces to practice implementation and fully harness from the opportunities AI holds in the SDG realization.

In Bermuda, a government-initiated sandbox is exploring wave power as a new green energy source, despite existing regulatory and safety barriers. This controlled environment allows for the safe testing of wave-generated energy, allowing the government to, via experimentation, test if wave-generated energy can become a feasible source[2]. This endeavor directly contributes to SDG 7 (Affordable and Clean Energy) by overcoming regulatory and safety barriers to test the feasibility of wave-generated energy.

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[2] "New Legislative Amendments Pave the Way for Energy Regulatory Sandbox | Government of Bermuda," May 22, 2023, https://www.gov.bm/articles/new-legislative-amendments-pave-way-energy-regulatory-sandbox.

Similarly, Indonesia's health sector has embraced a regulatory sandbox to advance technologies for malaria reduction, aligning with SDG 3 (Good Health and Well-being). Initiated by the Ministry of Health, this sandbox supports the safe trial of disruptive technologies, such as e-malaria solutions, promoting their integration into the national health system. By bridging legal gaps and fostering stakeholder collaboration, the sandbox exemplifies how targeted innovative testing can accelerate progress towards specific SDGs. The collaborative efforts in Indonesia, including stakeholder engagement and the development of implementation guidelines, highlight the sandbox's role in facilitating the trial of innovations aimed at malaria elimination (Fuad et al, 2023). These examples underline the need for carefully choosing SDGs for sandbox initiatives, as not all AI applications equally serve each goal. It's essential to match sandboxes with relevant SDGs to address their unique challenges effectively, ensuring AI and innovation broadly support sustainable development.

Moreover, this dynamic approach fosters iterative learning and adaptation, ensuring that regulations evolve alongside technological advancements. It provides safeguards that are both effective and adaptable. Cross border sandboxes for AI could address challenges associated with applying technologies for the achievement of SDGs by using careful issue identification, choice of regulatory partners, information management and allowing for co-participatory approaches of numerous stakeholders. As already mentioned in a first report on cross border sandboxes for data, ongoing assessment and regular improvements in their design will be crucial [3]

The European Union (EU) exemplifies a unique case in the realm of cross-border sandboxes for Artificial Intelligence (AI), moving beyond the traditional focus on

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[3] Datasphere Initiative., "Sandboxes for Data: Creating Spaces for Agile Solutions Across Borders.", 22.

financial services. The EU's approach allows for experimentation prior to market placement or service implementation, guided by a specific plan under the direct supervision and guidance of competent authorities[4]. This ensures compliance with the Act and, where applicable, relevant Member States' legislation, underscoring the potential for sandboxes to transcend sectoral boundaries and embrace a wider array of technological innovations[5]

Lessons from the EU and the cross-border impacts seen in sectors like Bermuda's ocean technologies suggest a strong case for extending sandboxes more widely. Such an approach would promote broader, inclusive adoption of innovative technologies, ensuring their benefits extend beyond specific countries or sectors to support global sustainable development goals more effectively.

2. Develop a strategic and coordinated agenda for implementing regulatory sandboxes across various sectors, including health, energy, social welfare programs, and food access, among others.

The G20 is uniquely positioned to develop a strategic and coordinated agenda for the implementation of sandboxes, involving the setting up of task forces and strategic resource allocation. This cohesive global agenda will streamline national strategies with international goals to improve collaborative action towards achieving SDGs, including commitments under the Paris Agreement. Coordinated action at international levels ensures that sandbox initiatives contribute meaningfully to global sustainability efforts.

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[4] European Commission. Artificial Intelligence Act. art. 53 (3).
[5] *Ibidem*.

Currently, cross-border sandboxes are still evolving, so are sandboxes around AI[6]. Initiatives by the Southeast Asian Nations ASEAN and the GSM Association (GSMA) are in their early stages. Additionally, provisions for cross border sandboxes are mentioned in the European Union (EU) AI Act (Art. 53 (1)) stating that sandboxes shall be established by one or more Member States competent authorities or the European data protection supervisor[7]. Another example can be found in the Canada- United States Mexico Trade agreement (CUSMA), which refers to cross-border sandboxes for financial services. Finally the Digital Economy Partnership Agreement (DEPA) between Singapore, Chile and New Zealand has a similar mention[8].

The G20 New Delhi declaration of 2023 already mentions cross-border data flows for enabling rapid transformations and bridging existing digital divides (Kurbalija, 2023). Through that, it envisions that both, the public and the private sector could leverage effective deliveries of technologies for society and cross-border collaboration could lead towards resilient infrastructures that can be built on open standards and specifications (*Ibidem*). Such international collaboration itself can ultimately already be seen as a step towards for instance achieving certain SDGs for instance on industry, innovation, and infrastructure (SDG 9) as well as partnerships for the goals (SDG 17)[9].

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[6] Datasphere Initiative., "Sandboxes for Data: Creating Spaces for Agile Solutions Across Borders.", 22. and "The EU AI Act - Balancing Human Rights and Innovation Through Regulatory Sandboxes and Standardization," Competition Policy International, accessed March 27, 2024, p. 7, available at: https://www.pymnts.com/cpi_posts/the-eu-ai- act-balancing-human-rights-and-innovation-through-regulatory-sandboxes-and-standardization/

[7] xiii European Commission. Regulation of the European Parliament and of the Council: Laying down harmonized rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain Union legislative acts. (Brussels: European Union, 2021): art. 53 (1). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0206

[8] Datasphere Initiative., "Sandboxes for Data: Creating Spaces for Agile Solutions Across Borders.", 5.
[9] "Sandboxes for Data Governance: Global Responsible Innovation | IGF 2023 WS #279 | Digital Watch Observatory," Digital Watch Observatory.

Implementing a robust framework for monitoring and evaluation is critical. Performance metrics should encompass technological innovation, economic growth, sustainability, and inclusion. The G20 should establish a mechanism for peer review and shared learning, enabling countries to assess their progress, refine strategies, and replicate successful models. This process will not only validate the effectiveness of regulatory sandboxes in driving innovation but also ensure that these innovations contribute positively towards the SDGs and broader societal goals.

3.   Discuss and outline optimal regulatory principles that would support harmonized and standardized practices within regulatory sandboxes and promote the use of emerging technologies, such as AI

There is a pressing need to promote discussions that outline standardized sandbox practices and regulatory principles across borders. To mitigate risks and ensure ethical considerations in technological development, the G20 should convene expert working groups—including policymakers, academics, and industry leaders—to facilitate these discussions. Establishing common standards enhances interoperability and fosters collaborative, sustainable development, alongside policy harmonization. Comparative analysis of sandbox frameworks across different jurisdictions reveals varying regulatory approaches, underscoring the value of harmonization in promoting effective and responsible innovation.

As described above, SDGs and sandboxes have developed a highly intrinsic relationship. Thus, the design of every regulatory sandbox should be aimed towards and influenced by SDGs. Underlying values should be at the heart of every experiment developed through sandboxes of AI. A hypothetical example can illustrate this better. A

country that wishes to promote a regulatory sandboxes should start its design of the initiative following this set of considerations:

- How has my SDG compliance agenda been developed.

- In which cases are there technologies that could help to meet or accelerate the compliance of such agenda.

- Could these technologies be used more quickly if they were experimented within a sandbox?

- Which specific norms could be relaxed in the sandbox?

- Which authorities would lead the development of this space in country X?

- Which entities would lead the gathering of results and the impact of the technology in the development of solutions?

Theses are considerations that should be at the forefront of every phase in the development of any sandbox initiative. This is particularly through for the initial design process where questions around the basic tenets and principles of the sandbox will be defined. SDGs serve then as foundational goals that can support the basic basic principles of setting up sandbox of AI. Often, countries launch sandboxes driven by current trends, leading to their widespread application across popular domains. By aligning sandboxes with SDGs, they will be more rigorously analyzed and targeted at solving societal challenges

Scenario of outcomes

Positive Outcomes

Implementing G20's sandbox recommendations and aligning regulatory principles can drive responsible tech innovation, crucial for achieving SDGs. This approach enables safe trials and collaboration on advanced technologies like Generative AI, addressing societal needs in healthcare, environmental conservation, and education. It opens up technology experimentation to developing economies, promoting digital inclusivity. Through harmonized regulations and international cooperation, these efforts bridge digital divides and support inclusive growth. A targeted implementation strategy and comprehensive monitoring ensure these innovations contribute to global sustainability and legal interoperability, aligning with wider international objectives.

Sandboxes can accommodate multiple technologies, facilitating the implementation of emerging technologies through: (i) the development of harmonized data standards, (ii) consumer protection frameworks, and (iii) ethical guidelines in ways that static regulatory regimes cannot.

The harmonization of data standards through sandboxes facilitates seamless data sharing and interoperability across borders, ensuring that innovations can be scaled up effectively while respecting privacy and security norms. This encourages the development of global standards, essential for technologies like AI that operate on vast datasets (UNCTAD, 2023).

Secondly, sandboxes can give insights into how emerging technologies affect its users and environments, leading to the identification of potential risks and allowing to propose respective safeguards. This preemptive action helps in building trust and encouraging wider adoption of emerging technologies (World Economic Forum, 2022).

Finally, ethical guidelines within sandboxes ensure that new technologies are developed and deployed in a manner that respects human rights, promotes fairness, and avoids harm. By incorporating ethical considerations from the outset, sandboxes can guide the responsible development of technology (United Nations, 2023).

Given that sandboxes serve as an agile response to complex systemic problems of emerging technologies, connected risks and innovative potentials for human groups and norms, this brief argues that cross border approaches to Sandboxes could serve as a helpful tool. The G20's leadership in this domain could catalyze transformative progress toward a sustainable, equitable future, where technology serves as a foundation for societal advancement, economic growth, and global inclusivity in innovation.

Potential Trade-Offs

While the G20's recommendations for regulatory sandboxes promise to harness the potential of technological innovation for societal benefit, several challenges and downsides need consideration.

While aiming to democratize access to technological experimentation, the actual implementation of regulatory sandboxes might inadvertently favor certain industries or technologies over others, leading to imbalances in innovation landscapes. This selectivity risks marginalizing sectors that could significantly contribute to sustainable development goals but lack immediate commercial appeal or visibility.

Data security and privacy rights, alongside issues such as algorithmic bias and other ethical dilemmas, are of paramount concern. The adoption of emerging technologies, while promising, brings forth challenges in ensuring that data is used responsibly and that innovations do not perpetuate or exacerbate discrimination and inequality.

Moreover, differences in regulatory frameworks across jurisdictions challenge the interoperability and cross-border collaboration essential for global progress. While regulatory sandboxes aim to foster international cooperation, aligning diverse legal systems and standards remains a significant hurdle, potentially impeding the seamless exchange of ideas and technologies.

Lastly, the scalability versus specificity conundrum underscores the challenge of designing regulatory sandboxes that are both broadly applicable to encourage widespread innovation and sufficiently tailored to address specific local needs and conditions. Achieving this balance is crucial for the effective global implementation of such frameworks but presents a complex task for policymakers and regulators.

Conclusion

In line with the G20's goal of promoting a fair and sustainable world, incorporating GenAI within regulatory sandboxes offers an innovative way to drive responsible and sustainable innovation. This strategy provides a customized framework for testing new technologies and eco-friendly policies globally, with a focus on reducing CO_2 emissions through green tech. This approach facilitates international cooperation and regulatory harmonization, enhancing global impact. It is essential for advancing AI and sandbox use towards achieving SDGs, contributing to global environmental sustainability and equitable progress.

The G20's push for regulatory sandboxes and GenAI can lead to significant progress towards SDGs by creating a conducive environment for responsible innovation, harmonizing regulatory principles, and sharing advancements widely. The spread of regulatory sandboxes, along with a focused implementation plan and thorough monitoring, promises transformative sustainable development globally.

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