

# Regulating AI through sandbox: Roadmap for developing and under-developed countries

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## Abstract

Artificial intelligence (AI) is fundamental to the attainment of sustainable development goals (SDGs). It can either accelerate the pace toward SDGs or create significant hindrances due to its potential to create inherent biases and risks toward vulnerable groups. Therefore, AI needs to be regulated to protect citizens against the risks—but in a manner that does not hamper innovation. Regulatory sandboxes for AI (hereby referred to as AI sandbox) can be a promising solution to regulate AI without compromising on innovation. Developing and underdeveloped countries can follow a seven-step roadmap to launch an AI sandbox: develop a national AI policy/strategy, establish a dedicated regulatory agency on AI, upgrade the existing consumer protection and data protection framework, draft the sandbox framework, develop testing protocols and data-sets, launch of the sandbox and the first cohort, and exit and reporting. Global cooperation supported by United Nations Forum on Science, Technology and Innovation for the SDGs (STI Forum) may act as a catalyst in the implementation of AI sandboxes by developing and under-developed countries.

## 1. Introduction

Artificial intelligence (AI) has emerged as a promising and disruptive technology with the potential to impact almost every sphere of socioeconomic development today. It is poised to play a catalytic role in the attainment of Sustainable Development Goals (SDGs). AI can support the attainment of 134 targets across 17 goals, but it may also hinder progress in 59 targets (Vinuesa, et al., 2020). While the benefits of AI are immense, there are serious individual and societal risks associated with AI. These risks include privacy risks, algorithmic biases, a threat to fundamental rights, etc. (Reanda et al., 2020).

The recent influx of numerous AI applications such as ChatGPT, Bard, etc. represents only the tip of the iceberg of the impending AI revolution. This influx coupled with recent technological development in AI indicates that the world may witness far more sophisticated AI solutions in the next 5 to 10 years—the solutions that may have huge potential for social good but may also cause significant harm if left unregulated or used with wrong intent.

Hence, regulating and supervising the development and deployment of AI solutions is becoming a clear priority for many countries and governments. However, framing

an effective regulation on AI is a challenging task for both developed and developing countries due to the fast evolution of AI technology and its use-cases as compared to the regulatory capacity. Regulating AI is particularly challenging for developing and under-developed countries due to limited capacity, resources, and exposure to the development and actual implementation of AI solutions in their jurisdiction. Regulatory sandboxes<sup>1</sup> for AI (hereby referred to as AI sandboxes) can be a valuable policy instrument to inform and shape effective regulation of AI in developing and under-developed countries. It can also act as a critical bridge between AI policy and regulation and large-scale deployment of AI solutions as they make it possible to test new technologies under a regulator's supervision and contribute to evidence-based policymaking (Pop, 2021). Various jurisdictions including Norway<sup>2</sup> and Spain<sup>3</sup> have already started experimenting with AI sandbox.

Developing countries have a strong experience in the design and implementation of regulatory sandboxes for financial innovations (World Bank, 2020) and hence these countries can readily tap into this experience to design and implement AI sandboxes.

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<sup>1</sup> According to Consultative Group to Assist the Poor (CGAP), a regulatory sandbox is a tool for developing evidence about how a new product, technology, or business model (innovation) works and the outcomes it produces. It allows the regulators to test and monitor outcomes of proposed innovations in a controlled environment.

<sup>2</sup> Norwegian Data Protection Authority launched a sandbox on responsible AI. See the sandbox webpage [here](#)

<sup>3</sup> The government of Spain and the European commission presented a pilot of the first regulatory sandbox for AI in June 2022. See the launch event page [here](#).

## 2. Key considerations in building a roadmap to launch an AI sandbox

We examined selected cross-sectoral (financial innovations, privacy, etc.) and cross-jurisdictional experiences of regulatory sandboxes to formulate an AI regulatory sandbox roadmap for developing and under-developed countries. We have tried to take into account the varying capacity of different governments and hence have covered all the important elements and steps to design and implement an AI sandbox.

This dual approach allowed us to try building a high-level yet comprehensive roadmap for implementing an AI sandbox.

## 3. Roadmap to setting up an AI sandbox in a developing and under-developed country

Though regulatory sandbox appears to be a powerful tool for promoting innovation, setting them up is complex and challenging especially for developing and under-developed countries due to the reasons highlighted previously. The following seven steps outline the roadmap for setting up an AI sandbox:

**1. Develop a national policy or strategy on AI:** The countries can start by framing a national policy or strategy on AI. The policy/strategy may highlight the key objectives, focus sectors, and likely AI interventions which have high potential for social impact. It may also clearly identify the relevant stakeholders (concerned ministries and government agencies, industry associations, academia, accelerators, impact investors, etc.) and their potential role in the AI ecosystem. The policy should create a pathway for the establishment of a dedicated national agency on AI.

**2. Establish a dedicated regulatory agency on AI:** After the launch of AI policy/strategy, the countries can establish a dedicated agency with regulatory powers to oversee the development, deployment, and impact of AI solutions on different sectors and population groups. This agency will host the sandbox and will be responsible for improvising the national/strategy policy on AI regularly, building an AI ethics framework, and creating a regulatory framework to regulate AI highlighting governance and accountability mechanism.

The agency should be formed with a long-term commitment (as developing an AI regulation is an evolving process) and should have its dedicated staff. The agency may also engage with global experts on AI, sandbox, etc. on an as-needed basis and retain them as advisors.

## 3. Upgrade the existing consumer protection and data privacy law and frameworks

This agency may work closely with the national data protection and privacy regulator to ensure that the existing data protection and privacy law has appropriate provisions to safeguard people from the privacy risks arising from AI.

In case, there is no data protection and privacy law, the agency can work with relevant stakeholders to draft a data protection and privacy framework specifically for AI applications.

The agency may also have to work with consumer protection watchdog to add provisions to protect people from any bias or discrimination arising from any AI application.

## 4. Draft the sandbox framework and collaboration strategy

After developing an appropriate regulatory outline on AI, the agency can develop the framework of the AI sandbox. The framework document will outline the sandbox's strategy over the next 2 to 3 years covering the key themes/focus areas of different cohorts, type and duration of cohorts, eligibility of participating players, application process, selection criteria, type of engagement/support given to participating players, boundary conditions, and exit process, etc.

The agency should also establish a governance framework to run the sandbox properly that covers the mechanisms for ongoing supervision and accountability for various stakeholders. The agency has to collaborate with other regulators and line ministries for running specific cohorts. For instance, the agency will have to work with the Ministry of Health or healthcare regulators to run a cohort on "AI in health".

## 5. Develop testing protocol and data-sets

The agency shall develop or facilitate the development of a comprehensive testing protocol including different data-sets (having dummy data) that are representative of national demographics and socio-economic profile, key performance indicators (KPIs), clear definition of success or failure, and measurement of outcomes. Since the AI algorithms are trained on the data-sets, it is critical to test the AI solutions on these nationally represented dummy data-sets to determine the efficacy and identify any potential risks or biases.

The testing protocol may vary for each cohort depending on the cohort and has to be developed in collaboration with partner government agencies and other stakeholders. The national ministry or

department responsible for the collection and processing of demographic data is a key stakeholder in this exercise.

## 6. Launch of the sandbox and the first cohort

After doing all the necessary groundwork as highlighted in the first five steps, the agency can launch the sandbox along with the call for applications for the first cohort.

A dedicated website may also be launched to invite applications and an outreach strategy may be developed and implemented to engage with all the important stakeholders during the cohort.

## 7. Exit, reporting, and ongoing monitoring

After the end of the first cohort, the participating players may secure any of the following outcomes depending on the result of the testing protocol and other factors. This may include: a.) Unconditional authorization (launch of the AI application as-is), b.) Conditional authorization (launch of the AI application only after implementation of recommended changes) and c.) No authorization (launch of the AI application is not allowed).

The sandbox team may also publish reports on the progress, test results, and outcomes achieved during the cohort for the participating players. The team may also undertake a detailed review of the entire sandbox and cohort management process to improvise for the next cohorts.

Lastly, the sandbox team may continue to monitor using a few AI applications after their graduation to ensure that they are not causing any unexpected bias or harm to people, especially the vulnerable segments.

## 4. Global cooperation in AI sandboxes

The EU's proposed 'Artificial Intelligence Act' calls for the establishment of common rules to implement AI sandboxes in EU member countries (Madiaga & Pol, 2022). Developing and under-developed countries may follow a similar approach and collaborate through regional blocs such as African Union to develop common principles to design and implement AI sandbox in their jurisdiction.

The STI Forum may also advocate and establish an institutional facility to support developing and under-developed countries to develop dummy data-sets that are representative of national demographics. These data-sets will help to make impactful AI solutions relevant for the developing world where countries demographics differ significantly from each other.

In conclusion, AI sandboxes will greatly help develop the capacity of developing and under-developed countries to develop effective policy and regulatory framework on AI. It will also strengthen the national AI ecosystem and develop a reliable pipeline of impactful and safe AI solutions.

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