

**CONSUMER PROTECTION ASSOCIATION  
HIMMATNAGAR  
DIST. : SABARKANTHA  
GUJARAT**



**Comments**

**On**

**Encouraging Innovative Technologies, Services, Use Cases,  
and  
Business Models through Regulatory Sandbox in Digital  
Communication Sector**

**Introduction :**

1. Emerging Technology (ET) applications are helping to accelerate industry maturity across sectors and impacting businesses, consumers, and governments alike. Such technologies are becoming key drivers of economic growth and include the Internet of Things (IoT), Cloud Computing, Artificial Intelligence (AI) and Machine Learning (ML), Blockchain, Big Data & Advanced Analytics, 5G Technology, Robotics, Advanced Manufacturing, Augmented / Virtual

Reality (AR/VR), Digital Twin, RegTech and Autonomous Vehicles among others.

2. A regulatory sandbox enables innovators to trial new products, services and business models in a real-world environment without some of the usual rules applying.
3. They're used in many sectors and are now becoming increasingly popular in the spectrum world.
4. According to the ITU's 2022 [Global Connectivity Report](#), nearly a quarter of countries (47) worldwide have created safe spaces for regulatory experimentation.
5. In addition, almost a third of countries (62) have identified emerging technologies as a policy priority. They have adopted a forward-looking spectrum strategy or regulations and plans with regard to the Internet of Things.
6. TRAI should set out its plan to support the development of Spectrum Sandboxes in its recent Spectrum Roadmap. Sandboxes will utilize field trials and the collection of real world data to explore technical solutions to improve the way spectrum is used and shared by different users. The increasing use of network function virtualization, software defined radios and ability to collect and process massive data

sets have made Sandboxes a viable way to help develop new solutions for sharing.

7. In light of the growing interest and demand in accessing spectrum, where TRAI has introduced a shared access approach between incumbent and new users, TRAI should be keen to develop the first sandbox in this band. Any learning from this sandbox should be feed into TRAI's review of their current authorization approach in the band.
8. The TRAI should expand its current work on monitoring and influencing the development of next-generation wireless network technologies, including monitoring emerging demand ahead of 6G mobile networks, and solutions that could enable voice and data services to be delivered directly from satellites.
9. We are living in an opportune moment to proactively address the discussion around AI regulation. For this, it is essential to understand the regulatory task does not begin only at the time of drafting legislation, but much earlier, with the collection of evidence, the development of understanding about potential impacts and the exercise of pilots that allow weighing the value tensions and generate social consensus.
10. With the advent of fintech, the traditional systems in place to regulate various entities in each of these sectors are

disrupted. Such disruption causes a problem not only to the existing big players in any of these sectors but also to the regulators as the existing regulatory regime is found wanting in front of the innovations that spring up at an exponential rate. It is common knowledge that laws, across the world, more often tend to be reactive rather than proactive. This is true even with respect to regulatory bodies, especially India.

11. Latin American countries are increasingly using regulatory sandboxes to enable testing technology, regulations, and business models in a controlled environment and spur innovation.
12. The Digital Communication sector is complex, inherently risky and regulated. The increasing use of Technology in Digital Communication in recent years has added complexities and posed challenges for Regulators and others across the globe. There should be increased competition, new more efficient or more beneficial products and services, financial inclusion and improved consumer choice. Jurisdictions across the country and beyond have adopted various initiatives to keep abreast of the rapid technological developments and to encourage the development of their ecosystem. In the face of the rapidly changing environment and given the limitations of traditional law making, jurisdictions have resorted to innovative

disruptions. One can examine the setting up of Regulatory Sandboxes and innovation hub ( Collectively referred to as “ Innovation facilitators” ) as part of the overall strategies pursued by various jurisdictions in response to the Digital Communication development.

13. These frameworks should allow testing new concepts in controlled environments, granting exemptions, allowances, or time-bound exceptions.
14. These frameworks should aim to promote regulators' desire for innovation with economic resilience and consumer protection.
15. The authority should approaches the issue with the aim to promote creativity and accelerate the uptake of cutting-edge technologies in the field of digital communications.
16. We strongly feel that, there is a need for providing an enabling environment for the development and deployment of novel technologies, services, use cases, and business models to stay up with this dynamic environment.
17. It is important not only to have a sandbox, but to frame the regulations, restrictions and frame of operation in such a way as to facilitate and incentivize the makers of innovative products to willingly register in the sandbox. The sandbox, if

too restrictive, will be seen as a mode of stifling innovation and will discourage players from taking part in the testing process.

18. The TRAI should encourages and welcomes firms to provide innovative Digital Communication solutions or services to ensure a reliable and secure Digital communication supply, promote effective competition in the market and develop a dynamic Digital Communication Sector in India.
19. Against the backdrop of a fast evolving Digital Communication landscape, where emerging Digital communication technologies and business models have brought about many opportunities that have the potential to reshape economies and industries, a responsive and forward-looking regulatory approach will help promising Digital Communication innovations to develop and flourish. In this regard, the establishment of a regulatory sandbox can create an environment where regulations can be relaxed within parameters, to promote innovation in India's Digital Communication sector. It also allows the regulator to assess the impact of new products and services before deciding on the appropriate regulatory treatment.
20. The Sandbox cannot remove all risks, as failure is an inherent characteristic of innovation, the environment can provide the

necessary safeguards to contain the consequences of failure on consumers and the Digital Communication market. At the same time, the Sandbox can provide an avenue for TRAI to review its regulatory frameworks and to provide appropriate regulatory support to firms.

21. The Sandbox should be intended to allow the industry to test new products and services in a safe and conducive space, while providing the necessary safeguards to protect consumers and the Digital Communication market. At the same time, the Sandbox should provide an avenue for TRAI to review existing regulations and adjust them as appropriate to support innovation.
22. The Sandbox has a role to play in TRAI's multi-stage approach to find innovative solutions that create our digital Communication future. This approach entails :
  - (i) Identifying specific technological solutions or business models needed to achieve our intended Digital Communication outcomes;
  - (ii) Adopting strategies to develop and trial such solutions;
  - and (iii) Deploying and scaling up successful solutions.

22. In the aim to develop innovative solutions, TRAI should partner with the Digital Communication industry on research & development (R&D) grants, test-bed programmes and manpower development initiatives. These ongoing strategies should be complemented by regulatory reliefs and data sharing to further encourage innovation in the Digital Communication sector.
23. We feel that access providers will be benefited due to the fact that the sandbox provides these access providers an opportunity to test and develop new processes which intern will help them introduce new and innovative business models along with introducing ways to ensure regulatory compliances in a more economical way.

### **The Regulatory Sandbox Approach :**

1. TRAI should encourage more experimentation in the Digital Communication sectors so that promising innovations can be tested in the market and have a chance for wider adoption in India and abroad.
2. To achieve this objective, an interested party/parties can apply to adopt a Sandbox to experiment with innovative products and services within a well-defined space and duration. The Sandbox should include appropriate safeguards to contain the



consequences of failure and maintain the overall safety and soundness of the Digital Communication system. TRAI may also support the sandboxing of similar products and services that could run concurrently, as long as they meet the objectives and the evaluation criteria.

3. The Sandbox should be deployed and operated by the applicant, with TRAI providing the appropriate regulatory support by relaxing specific legal and regulatory requirements prescribed by TRAI, which the Applicant should otherwise be subject to, for the duration of the Sandbox. Depending on the proposed product/service, the Applicant involved and the proposal made to TRAI, TRAI will determine the specific legal and regulatory requirements which it is prepared to relax for each case.
4. Upon the completion or expiry of the Sandbox, the Applicant must fully comply with the prevailing and relevant legal and regulatory requirements for its continued operations.
5. TRAI should not provide any funding for proposals selected for the Sandbox (the “Sandbox Project”). There may also not be any charges levied on the Sandbox Project associated with the running of the Sandbox (e.g. application fee/trial fee). TRAI however, reserves the right to recover the relevant costs for the operation of the sandbox from the participants.

## **How these activities deliver the spectrum vision :**

In addition to potentially accelerating the process for agreeing conditions for shared use of spectrum, the proposed spectrum sandbox activities could also help to deliver improvements in spectrum efficiency by allowing spectrum users to see ‘real world’ evidence that radio systems can coexist without suffering harmful interference. This approach should also provide opportunities for innovation, with spectrum users able to try out innovative sharing approaches and make iterative improvements to sharing algorithms in the field with the involvement of potential future sharers. If successful, these sandboxes could enable accelerated access to additional spectrum for wireless services used by consumers, businesses and the public sector.

## **Objectives**

To be successful, Sandboxes will require cross industry collaboration and innovation.

The objective should be :

- Current and anticipated use cases for the spectrum. Are there use cases that are not supported by the current authorization approach?
- How to best collect data on nature of propagation and interference in the band that is representative of real work deployments and equipment? Analysis of this data will inform future testing within the sandbox.
- Terms of Reference and ways of working for stakeholders that want to continue to participate in the Sandbox.

**Purpose :**

1. The purpose should be to foster innovation and increase the pace of adapting TRAI's regulatory framework to technology advances.
2. The Regulatory Sandbox should be as an alternative regulatory mechanism that allows testing of new products, services and solutions in any aspect of Information and Communication Technology ( ICT ) sector.
3. The Regulatory Sandbox should be intended to enable Telecommunication network and Service providers as well as content and Application providers to test new business model while under the supervision of TRAI.

4. These tests may be conducted for the Specified periods and within Specified area under flexible regulation or with Regulatory Exemption.
5. Telecommunication Network and Service Providers – whether Multinational or Community based entity – may participate.
6. TRAI should use this flexible environment to inform future Regulatory framework, which may lead to modification or elimination of current rules deemed overly stringent.
7. Currently, The TRAI is in the preparation stage and should begun series of capacity building activities to engage companies across the ICT Sector.

8. Accelerating Innovation and Sharing :

TRAI should explore new ways to enable innovation and sharing, such as using spectrum “ Sandboxes “ in **Specific Bands**, to enable industry to collaboratively experiment with new sharing techniques in real world environments.

- 8.1 The process for defining sharing conditions between different users/uses is a complex one and can take many years due to conflicting requirements. The process can often lead to conservative assumptions that limit network deployments and utilization of a band.

- 8.2 TRAI should encourage and enable ‘spectrum sandboxes’ to accelerate innovation and develop new ways to share spectrum. This type of collaborative, iterative development in a field trial environment has become more viable with the move to software defined radios and network function virtualization. These software centric systems allow faster and more flexible iterations than is possible with hardware based radios and performance data collected from the systems themselves can reduce the cost of performing field measurements with specialist, high-cost equipment.
- 8.3 The success of a sandbox approach is very dependent on the engagement of industry and the quality of collaboration. TRAI should seek to take a facilitating role, looking to industry and academia to drive the process. TRAI should draw on lessons learnt from relevant international initiatives, such as the Spectrum Collaboration Challenge run by DARPA in the USA (which used virtual sandboxes).
- 8.4 TRAI should aim to start their engagement with industry in the coming months to explore how best to establish the first sandbox and which bands to target.
- 8.5 Subject to the success of the initial work in this area, TRAI should also consider what other bands may be suitable candidates for future spectrum sandboxes. The sandboxes

initiatives would run in parallel with, and inform the work on, database driven and more dynamic approaches to managing spectrum.

### **Target Audience :**

The Framework should be of particular interest to entities that are looking to leverage on existing or new technology in an innovative way to provide products and services in the Digital Communication sectors, or to improve business and operational procedures. The target participants include, but are not limited to, technology firms, as well as stakeholders and licensees in the Digital Communication sectors.

### **Eligibility Criteria :**

1. It should be open to authorized firms, unauthorized firms that require authorization and technology businesses.
2. Genuineness of the innovation should be checked
3. There should limited prior tests
4. There should be direct benefit to users
5. Risk to the Telecommunication system should be checked
6. Testing readiness of the solution should be there
7. Post testing deployment should be mandatory :

TRAI should recognize the importance and use of such sandbox in finalizing APIs (Application Programme Interfaces) and the specific details of its implementation.

TRAI should set up *‘or permit to set up a Regulatory Sandbox for testing implementation of regulatory checks using DLT networks and other technological solutions complementing DLT network(s) and to operationalize such regulatory sandbox, the Authority may, by order or direction, specify the requisite processes’*.

8. There should be fit and proper criteria
9. Sandbox may be set up only if the participation is voluntary and the data that is being shared with such entities is raw and not analyzed or processed.
10. TRAI should ensure privacy of the personal information of the users and consequently the data sets used in the sandbox must be anonymized.
11. **Consumer Benefits** : Participant must produce sufficient evidence showing that:
  - The innovation proposed should offer an identifiable and direct benefit (e.g., reducing cost or improving quality of service) or indirect benefits to consumers (e.g. increasing competition)

- It should have adequately identified and addressed any risks for consumers and markets resulting from its proposed innovation
- It should have put in place a suitable mitigation plan to manage those risks and ensure protection to consumers throughout the testing

### **POSITIVE INDICATORS**

- ✓ Participant provides research or simulation results showing potential benefits such as reducing cost, customer experience, efficiency, quality of product, lower prices, etc.
- ✓ The participant can produce a comprehensive assessment of risk to consumers as well as a mitigation plan to ensure consumer protection
- ✓ The participant has sufficient resources in place to provide appropriate redressal to consumers if required

### **NEGATIVE INDICATORS**

- ✓ Participant is unable to articulate how the innovations that are proposed can result in a clear benefit, whether direct or indirect, for consumers
- ✓ Participant is unable to provide a detailed set of risks including a set of mitigants that will ensure an adequate degree of consumer protection



- ✓ Participant cannot deploy resources proportional to the risks identified in case a redressal is required

## **Commercial Potential**

Participant must provide prove that the innovation proposed has strong commercial viability with:

- ❖ A commercial presence with one or more successfully marketed products and solutions; and
- ❖ A robust business plan
- ❖ Proof of business financial viability / funding

## **POSITIVE INDICATORS**

- Participant has a commercial license for one or more successfully marketed offerings
- Participant has a strong business track record
- Participant has a robust and promising business plan
- Participant is adequately capitalized on their balance sheet or agreed available funding (debt or equity or corporate budget)

## **NEGATIVE INDICATORS**

- Participant has no commercial license or partnership agreement with TRAI licensed business

- Participant has a commercial license, but shows no or limited commercial activities
- Participant has an unproven or unviable business plan
- Participant has limited evidence to show how they will fund tests

However, with respect to anonymized data sets, there is possibility of re-identification of such anonymized data and therefore it may not help in data protection.

Re-identification of anonymized data must be curbed and suitable standards should have to be set up to avoid such mishaps.

## **Procedure for submitting the application and approval process :**

### **Registration :**

TRAI should take note of the multiple DLT system operators and the constant evolution of both the solutions and requirements and in this context and should establish a test environment which would serve to test the new functions/processes or refine the existing functions/processes.

Similar to sandboxes proposed by other jurisdictions and other regulators in India, TRAI should provide exemption from certain regulatory actions when access providers and other participants are operating in the sandbox.

In a nod to data privacy, due to uncertainties in the testing of the solutions, specific consent from customers must be taken and participation in such testing should be strictly voluntary.

### **Objective and Principles of the Sandbox :**

1. TRAI should aims to develop an Digital Communication landscape that is forward-looking, dynamic and vibrant. To this end, the Sandbox can help to support innovation and risk-taking that could bring benefits to the market and consumers. The Sandbox should also complement ongoing Digital Communication Research initiatives, such as by providing a platform for Digital Communication projects to be tested on a broader scale in India.
2. The application period for the Sandbox should be open all year round (hereinafter referred to as the “Generic Sandbox”). Bottom-up ideas in all areas should be welcome, as long as they relate to the Digital Connectivity sectors.
3. All Sandboxes must have a well-defined space and duration for the proposed product/service to be launched, within which the consequences of failure can be contained.
4. TRAI should determine the specific legal and regulatory requirements which it is prepared to relax for Sandbox

Projects, depending on the product and/or service to be experimented.

5. Given its purpose, the Sandbox may not be suitable under the following circumstances:

(a) The proposed concept is considered similar to those that are already being offered in India, unless the applicant can articulate the insights to be gained. E.g. through showing that either :

(i) how a different technology or product/service is being applied, or

(ii) how the same technology or product/service is being applied differently;

(b) The proposed concept can already be implemented under the current legal and regulatory framework;

(c) The Applicant has not done its due diligence to test and verify the viability and safety of the product/service, such as testing the technology or product/service in a laboratory environment, and obtaining the necessary technical and safety certifications for the technology or product/service used in the experimentation; or

(d) The Applicant can reasonably and effectively experiment with the product/service in a laboratory or test environment.

6 Notwithstanding the above, proposals that are assessed upfront to have the risk of compromising Digital Communication system security or adversely affect the competitiveness of the Digital Communication market should not be considered.

### **Testing and Exit Plan :**

The Participant must produce a well-developed testing and exit plan (exit after successful testing and for the event of discontinued testing) that contain:

- ✚ A comprehensive testing plan with key milestones and detailed timelines
- ✚ A clear methodology of the testing and controls required
- ✚ Test team named with details of their roles in the test and within the overall organization
- ✚ Reporting schedule stating the format and content of the report to be submitted to TRAI throughout the testing
- ✚ Plans to scale-up its innovation to a larger market should the testing be successful
- ✚ Clear and measurable consumer safeguards

### **Sandbox Evaluation Criteria :**

1. The application should contain the necessary supporting information to depict how the Sandbox evaluation criteria listed below can be fulfilled:
  - (a) **Genuine innovation:** The submitted proposal should show that the product/service includes new or emerging technologies or products/services, or uses existing technologies or products/services in an innovative way.
  - (b) **Benefit to consumers and/or the Digital Communication sector:** The submitted proposal should show how the product/service can benefit the consumer and/or the Digital Communication sectors.
  - (c) **Need for Sandbox:** The proposal should show that the project cannot be deployed under current regulatory framework. For projects that require relaxing of regulatory requirements, the proposal should identify the limiting clauses and include alternative safeguards that can be put in place by the Applicant to address potential system, market or consumer concerns.
  - (d) **Ready for testing:** The proposal should show that the Applicant has secured or intends to secure relevant assets and resources for experimentation and has clearly defined test scenarios and outcomes.

- (e) **Defined boundary conditions:** The proposal should be as clearly defined as possible (e.g. by duration of experimentation; customer target segment or estimated customer base), for the Sandbox to be meaningfully executed while sufficiently protecting the interests of consumers and maintaining the safety and soundness of the Digital Communication sectors.
- (f) **Defined monitoring and evaluation procedure:** The Applicant should report to TRAI on the test progress based on an agreed schedule.
- (g) **Risk assessment and mitigation:** Significant risks arising from the proposed technology/product/service should be foreseen, assessed and mitigated. For instance, by providing evidence of preliminary testing, and by identifying risks and proposing mitigating measures for such risks.
- (h) **Defined exit and/or transition conditions:** The proposal should clearly define acceptable exit and transition conditions, should the Sandbox Project be discontinued due to certain reasons (e.g. inability to meet objectives of project; safety lapses etc.), be extended (e.g. additional time required to rectify faults), or can proceed to deployment on a larger scale at the end of

the Sandbox period. In particular, the conditions should ensure that affected consumers are kept whole in the event that the Sandbox Project is discontinued. Should the Sandbox Project include substantial investment in fixed assets, the Applicant should also specify how these fixed assets would be handled/decommissioned if the Sandbox Project is discontinued.

### **Thematic Sandbox :**

This section sets out the intent of using themes and challenge/problem statements to scope a Sandbox (hereinafter referred to as the “Thematic Sandbox”).

This section outlines its difference from the Generic Sandbox.

1. The Digital Communication is fast evolving and India has its distinct set of challenges. From TRAI’s perspective, from time to time, there will be top-of-mind concerns due to the system’s emerging needs.
2. The incumbent Generic Sandbox allows industry players to submit proposals based on areas they are interested in, all year round. While this welcomes Digital Communication innovation in all areas, industry’s applications to the Generic Sandbox may not adequately respond to changing needs of the energy system. TRAI should take a more active approach by encouraging developments in strategic areas that are of



greater importance to the India Digital Communication landscape.

3. Under the Thematic Sandbox, TRAI should create scoped themes and/or challenge/problem statements for strategic areas identified by TRAI. This would signal TRAI's interest in testing out solutions in specific areas, thus encouraging industry to provide innovative solutions that meet the system's priority and needs. This would be in the form of challenge statements by TRAI on their website and problem statements in other related websites.

### **Areas of Support for the Industry :**

1. This section should sets out how TRAI's schemes and resources are integrated to holistically support industry players' innovation efforts. To support the Thematic Sandbox, TRAI should also prepared to consider providing funding support to Applicants. TRAI should also prepared to supply Applicants with Digital Communication data that can be used to test and refine their proposed innovations.
2. Scoped themes and/or challenge/problem statements for Thematic Sandboxes may dovetail the challenge/problem statements cast by TRAI calls. Applicants applying through the TRAI call, may in the same application, indicate if

regulatory relief (as part of Thematic Sandbox) is also required. TRAI should coordinate internally on the respective evaluation processes and Thematic Sandbox requests. The Generic Sandbox continues to open all-year round as a catchall for other bottom-up experimentation ideas that fall outside the challenge/problem statements.

3. TRAI should expect digital technologies to play an increasing role in the Digital Communication sector, and the development and prototyping of such solutions require data. Where there is merit in the Sandbox proposal, TRAI may share market/consumer data with Applicants to support experimentation, subject to conditions including, but not limited to:

- 3.1 Applicants and TRAI may be required to enter into appropriate contractual agreement (e.g. Non-Disclosure Agreement) with TRAI to safeguard the confidentiality and security of information as part of the Sandbox;

- 3.2 Applicants should specify the
  - (i) purpose and use of the data,
  - (ii) personnel accessing the data, and
  - (iii) data retention period.

Data shared with Applicants should not compromise system reliability nor entities' (including

both personal's and company's) confidentiality and/or privacy. Anonymization and /or aggregation should be applied if necessary.

- 3.3 Applicants should have sufficient data security safeguards in place, and ensure that access to data deemed classified by TRAI is limited to authorized persons, as specified in para 3.2.2. All authorized persons should be security cleared at an appropriate level and sign an undertaking under the Official Secrets Act;
- 3.4 Applicants should securely destroy all classified data at the end of the project under the witness of appropriately security-cleared TRAI officer(s).
- 3.5 TRAI should assess and determine the format of data for sharing (e.g. granularity of data; a subset of data; time lag of data).
- 3.6 TRAI has the rights to all the data generated by the projected. Applicants shall share all relevant technical/operational data (arising from the project) with TRAI.
- 3.7 When handling data assessed by TRAI as classified or sensitive, Applicants should comply with all applicable laws and regulations, and any written instructions on

Government policies pertaining to Information Communications Technology (“ICT”) Management, codes of practice or standards of performance that may be issued by TRAI from time to time

- 3.8 Applicants should allow TRAI to conduct periodic audits of the Sandbox to ensure that there are proper controls and compliance. Applicants should cooperate with and provide all support, information and assistance necessary for the conduct of the audits;
- 3.9 Applicants should ensure that all its employees, agents and subcontractors comply with all obligations under the Personal Data Protection Act (“PDPA”); and
- 3.10 Applicants should immediately notify TRAI when it becomes aware that it has breached the contractual provisions relating to security, and/or unauthorized access, use and/or disclosure of personal data.

**License fee and duration :**

1. The license should be valid for up to 12 months, which participating companies may extend once for an additional 12 months within the specific geographic area.
2. License fee : As prescribed by TRAI

## Licensing process :

As highlighted in Figure , the TRAI can conduct the licensing process in five phases:

(1) application;

(2) evaluation;

(3) experimentation; and

(4) exit.

## Four phases of the regulatory sandbox authorization process

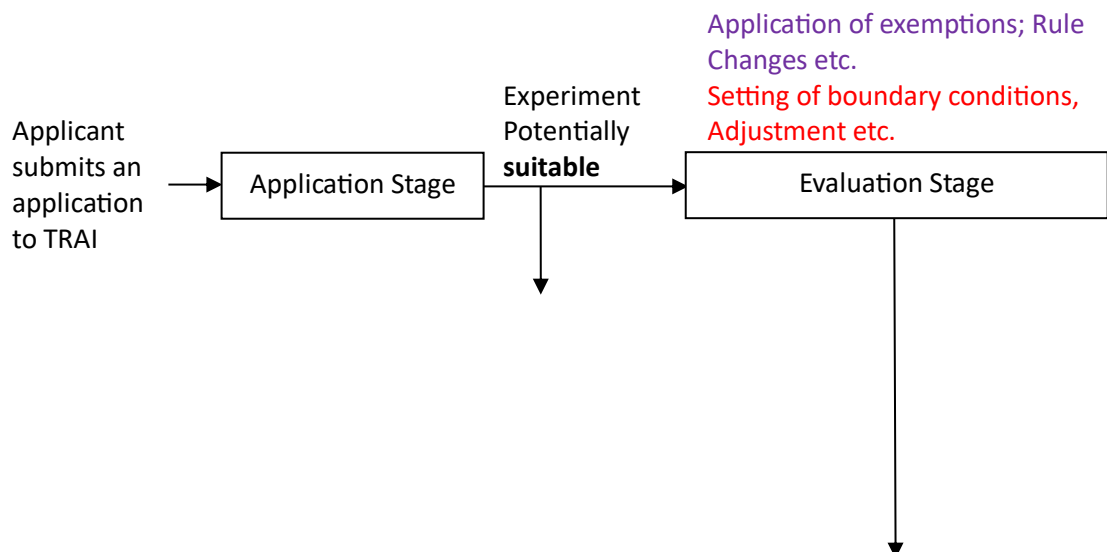
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Application	Evaluation	Experimentation	Exit
<ul style="list-style-type: none"><li>• TRAI should publish dates to receive proposals in 2023.</li><li>• Only approved proposals will go to the next phase.</li><li>• Total of 25 business days for this phase.</li></ul>	<ul style="list-style-type: none"><li>• Evaluation should be based on innovation, benefits for citizens, demonstrated need, and applicant's experience.</li></ul>	<ul style="list-style-type: none"><li>• Once TRAI authorizes the project, providers may start commercial operations in compliance with the parameters.</li><li>• 1 year with option to extend 1 year.</li></ul>	<ul style="list-style-type: none"><li>• Once testing is complete, participants may either close the project or transition to the general regulatory framework</li></ul>

- Total of 25 business days for this phase.

## Application and Evaluation Stages :

1. The Applicant should ensure that the proposal fulfils the proposed objectives, principles and evaluation criteria covered in this Framework. As part of the review TRAI should streamline the application (the number of entry fields should be reduced ) and should add a digital option for submission. Applications can be made at TRAI’s website or any other else as decided by TRAI. Alternatively, applications can be sent to sandbox email. The application form should be available on TRAI’s website. Queries related to the Sandbox can also be sent to this email account.
2. The following diagram depicts the application and approval process. EMA will communicate with the Applicant in the course of evaluating the Sandbox application, and will continue to do so during experimentation:



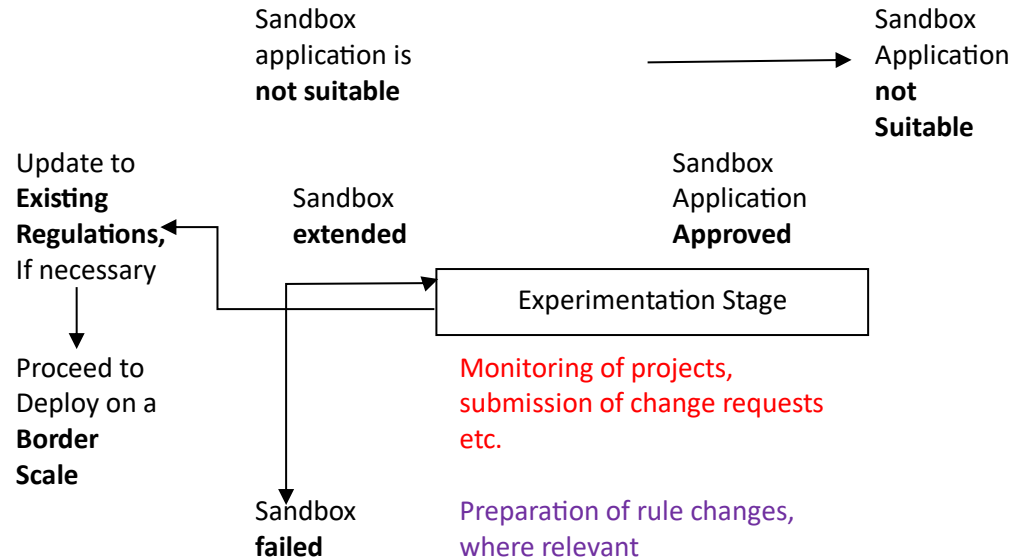


Figure 1: **Application and Evaluation :**

- (a) Prior to submitting an application, the Applicant can and should clarify any question regarding the Sandbox by writing in to TRAI.
- (b) At the “Application Stage”, TRAI should review the application and endeavor to inform the Applicant of its potential suitability for a Sandbox within 30 working days after TRAI receives a complete set of information necessary for the assessment. The preliminary indication serves to help the Applicant with its business and resource planning.
- (c) At the “Evaluation Stage”, the time required to assess the proposal is dependent on its complexity and the specific legal and regulatory requirements involved. External advisory services may be engaged for the evaluation,

where necessary. Due to the exploratory nature of the Sandbox approach, the Applicant should be allowed to make adjustments to the application for resubmission (for example, refining the boundary conditions) after discussing with TRAI. The Applicant would be informed in writing whether to proceed with the Sandbox. Different proposals may have different processes depending on whether they are :

- (i) covered under existing frameworks but do not meet certain rule requirements, or
- (ii) entirely new technologies/products/services that are not covered under existing regulatory requirements. The processing time for (ii) will take longer, as more time is required to customize the test boundaries and conditions for the Sandbox.
- (d) The Applicant should be informed of the reasons if the application is rejected. The reasons for rejection could include failure to meet the objective and principles of the Sandbox, or any of the evaluation criteria. Analysis of the benefits and costs of the Sandbox trial, including economic value and externalities, will be considered. The Applicant may re-apply for the Sandbox when it is



ready to meet the objective, principles and evaluation criteria of the Sandbox.

3. TRAI can allow proposals for new products and services to be experimented within the Sandbox with relaxed regulations. Such regulations include, but are not limited to:

(a) **Codes of Practices** - Under the TRAI Acts, TRAI has the powers to exempt stakeholders from the relevant provisions in the codes of practices.

(b) **Digital Communication Market Rules** - TRAI can work together with the Digital Communication Companies.

(c) **Licensing Conditions for Digital Communication licensees** – Under the TRAI Acts, TRAI may, with the approval of the concerned authorities, provide exceptions from licensing requirements. TRAI can continue to look at ways to facilitate the relaxation of such conditions related to the Sandbox.

Once the public call for proposals is issued, the TRAI should conduct an initial review to ensure that the applicants complied with the requirements in the public call. The TRAI should complete the initial review within 15 business days and publish its preliminary report for five business days, during which time applicants may

amend their applications. Within five business days of the correction period, the TRAI should verify and provide a written response as to why each proposal is either approved or rejected. There should be no limit on the number of proposals that may be approved.

Those proposals that move to the evaluation phase should be subject to greater scrutiny in which applicants must demonstrate:

- (1) That the project offers innovative products and services not currently available in the market;
- (2) The various benefits to society;
- (3) That the product or service cannot be implemented under the current regulatory framework; and
- (4) That the applicant can successfully implement the project.
- (5) Additionally, applicants must determine the risks of their projects, as well as specify safeguards to protect users and indicators to measure success. The proposals must also include an exit plan and applicants agree to comply with information collection requirements.

The TRAI should conduct the evaluation phase within 15 business days, with a five-day period for applicants to correct their

applications. Within five business days of the correction period, the TRAI should identify which proposals will be authorized.

### **Experimentation Phase :**

During the experimentation phase, the Trai issues the authorizations on a case-by-case basis. Each project should have its own test parameters, including the extent to which regulatory obligations will or will not apply. During this period, licensees may start commercialization or use of their products, services, or solutions. The experimentation phase lasts 12 months, which may be extended once for an additional 12 months. The TRAI should grant an exception if additional studies are necessary or if the licensee is interested in continuing to run the project.

Within 12 months of completing the experimentation phase, the TRAI should publish a final report identifying the conclusions and results of the project. The TRAI should use these final reports to review and potentially modify the general regulatory framework.

### **Experimentation/Sandboxing Stage :**

1. Upon approval of the application, the Sandbox will enter the “Experimentation Stage”. The Applicant shall notify its customers, if any, that the product/service is operating in a Sandbox and disclose the key risks associated with the

product/service. The Applicant should also be required to obtain the customers' acknowledgement that they have read and understood these risks.

2. For the purpose of transparency and provision of information to customers, relevant information of all approved Sandbox applications such as the name of the Applicant, the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox should be published on TRAI's website.
3. TRAI should be committed to monitoring the progress of every Sandbox trial. All Applicants must submit progress reports to TRAI in stipulated intervals. Reports must be presented in a pre-determined format that is clear, quantified and digestible for TRAI's analysis. At the mid-term and end-point of the "Experimentation Stage", the Sandbox entity and TRAI should have stock takes to review outcomes derived against pre-agreed indicators. TRAI should reserve the right to conduct spot-checks, by either TRAI officers or authorized third-party personnel.
4. TRAI should reserve the rights to terminate a Sandbox trial at any point of the "Experimentation Stage", if the Sandbox entity breaches pre-agreed conditions, or if there is no prospect for a successful outcome or regulatory change. Conversely, if the

results are very successful at the key milestones, TRAI may cut short the trial and adopt the proposed policy.

5. In the event that the Applicant intends to make material changes to the product/service under experimentation during the “Experimentation Stage”, the Applicant should apply to TRAI at least 1 month in advance and provide details of the changes with reasons (the “change requests”). The Applicant can continue experimenting with the existing product/service while TRAI reviews the change requests and informs the Applicant of its decision.

### **Testing and Monitoring :**

Once the participant has successfully passed the Preparation and Onboarding stage and is complying with all mandatory requirements, they can proceed to the Testing and Monitoring Stage. During the Testing and Monitoring Stage, participants can test their innovation according to the pre-agreed parameters and compliance checks as identified in the testing plan. The participants must fulfil the following requirements during the Sandbox testing stage:

1. Collect the data in the agreed manner throughout the testing phase to gauge the success / failure of the ongoing test scenarios

2. Maintain proper records detailing their business model, product or service performance, issues observed, risk mitigation and customer participation and other statistics
3. Prepare and submit periodic reports, with the schedule and details agreed on between the participant and the TRAI Sandbox Team
4. Interim reports to be submitted monthly

Once the participant submits interim performance reports, the TRAI Sandbox Team evaluates the report, and the results can follow one of the following scenarios:

1. Successful testing according to Key Performance Indicators ( KPIs ), safeguards and risk identifiers agreed in the testing plan: No red flags, the participant can continue testing.
2. **In case of Minor breaches:** The solution is put under scrutiny and corrective measures are taken.
3. **Significant breach:** In cases where there are significant breaches, participation in the sandbox may be terminated.
4. **Extension of testing time:** Extension of the testing timeline for participants in justified cases and upon decision of TRAI on a case-by-case basis. In some cases, further examination of the test result with other regulators or additional experts

might be required to allow TRAI to decide on the above mentioned four scenarios. Upon successful testing, and with the permission of participants, TRAI may disclose the results with relevant stakeholders to project the success trajectory of the participants and help them connect with the larger ecosystem. This process also helps participants build a track record and credibility for the offering being tested, which may be beneficial for market launch.

### **Exit Phase :**

In the exit phase, licensees choose one of two paths—either complete the project and stop the service or transition to the general regulatory framework. Whichever option is chosen, the licensee has up to four months to make any adjustments. Participants may choose to voluntarily dismantle their projects at any point and enter into the exit phase, which requires giving the TRAI at least 15 days' notice.

TRAI should develop a collaborative programme of work with industry to establish '**Spectrum Sandboxes**', which can provide a test ground to further explore the scope of some of these potential opportunities and the benefits afforded for spectrum users. TRAI should consider available outputs from any such collaborations as part of their review of their Shared Access

license, as well as their broader application to their Spectrum Management Strategy in the years to come.

### **Extending/Exiting the Sandbox and Assessing Need for Regulatory Change :**

1. At the end of the Sandbox period, the legal and regulatory requirements relaxed by TRAI will expire, and the Applicant must exit from the Sandbox unless otherwise notified by TRAI. There should be no default/automatic regulatory change, irrespective of the outcome of the Sandbox trial. TRAI may deem that. TRAI can consult the industry accordingly, before determining whether certain regulations can be permanently amended or relaxed.
2. In the event that the Applicant requires an extension of the Sandbox period, the Applicant should apply to TRAI as early as possible, with at least 1 month before the expiration of the Sandbox period. Nonetheless, the Applicant is encouraged to consult TRAI as early as practicable on the possibility of any extension. The Applicant is to provide reasons to support the application for extension (for example, if additional time is needed to make changes to the product/service under experimentation to rectify flaws, or if the Applicant requires more time in order to fully comply with the relevant legal and



regulatory requirements). It should also assume that the deadlines that were earlier committed to, such as those stated above of this document, are upheld unless otherwise notified. TRAI will review the application and approval will be granted on a case-by-case basis. TRAI's decision on the application for extension is final.

3. Upon exiting, the Applicant can proceed to deploy the product/service under experimentation on a broader scale, provided that:
  - (a) both TRAI and the Applicant are satisfied that the Sandbox has achieved its intended test outcomes;
  - (b) the regulatory treatment for the product/service for broader deployment is determined; and
  - (c) the Applicant can fully comply with the relevant legal and regulatory requirements.
4. The Sandbox will be discontinued ahead of schedule when:
  - (a) TRAI is not satisfied that the Sandbox can achieve its intended purpose, based on the latest test scenarios, expected outcomes and/or schedule mutually agreed with the Applicant;
  - (b) a substantial flaw has been discovered in the product/service under experimentation, or if there

are any severe unintended consequences, where the risks posed to consumers or the Digital Communication system outweigh the benefits of the product/service under experimentation, and the Applicant acknowledges that the flaw cannot be resolved within the duration of the Sandbox;

- (c) TRAI terminates the Sandbox due to reasons such as the Applicant breaching any condition imposed for the duration of the Sandbox; or
- (d) the Applicant has informed TRAI of its decision to exit the Sandbox at its own discretion.

5. The Applicant should ensure that any existing obligation to its customers of the product/service under experimentation must be fully fulfilled or addressed – i.e. affected consumers are kept whole – and that any fixed assets, if deployed, are properly handled/decommissioned upon exiting or discontinuing the Sandbox. The Applicant should also ensure that it has not entered into any relevant obligations that would extend beyond the intended expiry of the Sandbox period.

### **Exiting the Sandbox :**

Following the completion of their tests, or the end of the agreed testing period, participants transition out of the Sandbox.

Upon successful completion of testing and exit from the sandbox, participants shall proceed to deploy the innovation at a broader scale with a wider customer base. Exiting the Sandbox should comprise of the following five key steps:

- 1. Testing completion and wrap-up:** Towards the end of the Sandbox period, testing is concluded, and all related activities wrapped up as per the testing and exit plans.
- 2. Settlement of obligations:** Participants settle all their obligations (contractual, financial, and other commitments) related to the Sandbox, regulators, end customers and investors. All activities and actions relating to the Sandbox should be concluded in a timely fashion before the scheduled exit, unless otherwise agreed upon.
- 3. Achievement of outcomes:** Actual testing KPIs should be reviewed against the testing plan (to ensure key outcomes have been achieved).
- 4. Final report submission:** The participant drafts the final report in the defined format. The TRAI Sandbox Team can provide guidance or administrative support with the drafting of the final report as required.
- 5. Approval for exit:** The submitted final report is reviewed to assess whether it is satisfactory and complete, in which case it is forwarded for approval for the participant's exit.

Sandboxes are a learning experience for both TRAI and the Participants. Accordingly, and to improve the testing journey, enhance the regulatory environment and to come up with successful innovations/products/services, TRAI, participants and the ecosystem stakeholders must collaborate not only during the testing period, but also during the market launch stage.

### **Compliance Requirements :**

1. Monthly reporting for all participants
2. Participants are subject to Anti Money Laundering and fraud inspections at any point
3. Data privacy and security must be maintained as per laws
4. Laws take precedence over any other legal considerations
5. Participants are liable for any damage caused to customers
6. Health and safety measures to be defined and agreed before testing
7. Thresholds for complaints and test failure to be defined upfront

### **Limitations :**

**The success of a sandbox approach would depend on industry engagement and the quality of collaboration.**

1. Selected licensees should be subject to offering the service within the specified geographic area.

2. In the regulation, the TRAI should clarified that any exemptions or light-touch rules defined for a particular project imply the authorization for the development of activities outside the testing environment.
3. The proposed projects must not be found to negatively impact competition or consumers in the communications market. To this end, each project must identify the risks, safeguards, and indicators for success.

**Obstacles :**

- Creation of roadblock to emerging dynamic business models by choking investments and innovation incentives.
- Vulnerability due to aggregation of information in the form of freely available data sets.
- Lack of strong incentives with the government in investing in cutting edge technologies.
- Article 300A of the Constitution prohibits the state from depriving a person of their private property and a sandbox may result in violation of this constitutional right.
- Difficulty in implementation of notice, choice, limiting purpose and collection and right to object.

### **Some characteristics should be Included :**

A mechanism to be developed to contain the impact of the testing within the live system and if at all any deviation is observed in the system's behaviour or the application under the trial, such deviation in behaviour must be contained within the system.

### **Obligations :**

All entities selected to participate in the regulatory sandbox must report information on the project's progress to the TRAI. On a case-by-case basis, the TRAI should define the information collection protocols and the indicators that entities must report during the project period.

### **Spectrum Sandboxes :**

TRAI should work with industry and academia, in a defined geographic area, to explore how equipment can coexist in the real world. Participants should be given scope to experiment with different approaches and algorithms for sharing spectrum, laying the basis for a quicker and more innovative approach to agreeing sharing conditions. We think the sandbox model could be beneficial for exploring solutions in a number of different bands:

- There is currently interest for higher power, outdoor use in the lower 6GHz band and the band is already used by several hundred fixed links. A sandbox would provide the opportunity for interested parties to explore the possibility of sharing the band. Equipment and database standards already used in the US to support sharing (Wi-Fi 6E with AFC) could provide a useful starting point for trials – allowing participants to develop new and improved algorithms for sharing spectrum that could run on top of the pre-existing solution.
- TRAI should develop a more automated solution to issue Shared Access licenses to meet growing demand. A sandbox trial could provide an opportunity to overlay an option to enable more dynamic access – allowing greater flexibility of access by time, place and frequency. For example, the sandbox could explore whether less restrictive technical conditions could be enabled, such as higher power transmission, in an environment where there is more intelligent coordination between users.
- Whilst the technologies are still largely in the academic research phase, there may be opportunities to use a sandbox environment to explore the sharing of Terahertz spectrum between different users. These bands are already used by

passive earth observation satellites and there is potential demand in the mid-term for high capacity fixed links and in the longer term, 6G mobile communications and sensing applications. A controlled, sandbox environment could provide some early insight into how these applications might be designed to share spectrum. Given the nascent state of technologies in this band, a 'virtual sandbox' conducted within a software simulation that creates a digital twin of a real world environment may be more viable in the short term.

### **Proper Maintenance of Records during the testing period :**

The Regulatory Sandbox is can be viewed in the context of Distributed Ledger Technologies (DLTs) to mean *'a set of technological solutions that enables a single, sequenced, standardized and cryptographically-secured record of activities to be safely distributed to, and acted upon, by a network of varied participants and their –*

- (i) database can be spread across multiple sites or institutions;*
- (ii) records are stored one after the other in a continuous ledger and can only be added when the participants reach a consensus;'*

*Thanks.*



*Yours faithfully,*

*( Dr. Kashyapnath )*

*President*

*Member Organization : TRAI*

