

GUIDELINES FOR ACCESS, USAGE, AND MANAGEMENT

Of

THE NATIONAL COMMUNICATIONS TESTBED ON EMERGING AND FUTURE TECHNOLOGIES

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ABBREVIATIONS

AI:	Artificial Intelligence
API:	Application Programming Interface
AR:	Augmented Reality
CPU:	Central Processing Unit
GPU:	Graphics Processing Unit
ICT:	Information Communication Technology
IoT:	Internet of Things
VR:	Virtual Reality
MIMO:	Multiple Input Multiple Output
NSA:	Non-standalone
RDI:	Research Development & Innovation
SA:	Standalone
UAV:	Unmanned Aerial Vehicle
UICT:	Uganda Institute of Information and Communications Technology
UCC:	Uganda Communications Commission

1. INTRODUCTION

The Uganda Communications Commission (UCC) has set up a Communications Testbed (Testbed) for emerging and future technologies at the Uganda Institute of Communications Technology (UICT), Nakawa. This facility is designed to provide researchers, innovators, academia, and industry players with access to advanced technologies for testing and validating new ideas.

The goal is to encourage innovation, support research, and foster the development of local solutions that can be applied in Uganda and beyond.

1.1. Objectives of the Communications Testbed

- (i) To develop capacity and inform policy-making and regulatory processes.
- (ii) To stimulate market development and deployment of emerging technologies and infrastructure in Uganda.
- (iii) To support policy & technical regulation development with evidence-based research.
- (iv) To contribute to global Research Development & Innovation (RDI) testbeds, standards, conformance testing & peer-review.
- (v) To promote academic and ICT sector research on emerging technologies and their applications/ services.
- (vi) To promote innovation of local solutions and ICT services.

1.2. Benefits of the Communications Testbed

- a) The Testbed provides a platform for researchers, innovators, academia, and businesses to test and develop new technologies.
- b) It offers access to advanced tools, software, and data to support research, testing, and the creation of new solutions.
- c) The Testbed covers a wide range of ICT technologies, such as 4G and 5G networks, artificial intelligence (AI), Machine Learning, the Internet of Things (IoTs), Augmented and Virtual reality (VR), Unmanned Aerial Vehicles, Robotics, 3D printing, among others.
- d) The Testbed can support data analysis, developing new algorithms, testing computer models, designing control systems and specialized activities like signal and image processing, machine learning, and simulations such as: -
 - Data analysis and visualization
 - Algorithm development and optimization
 - Signal and image processing
 - Machine learning and deep learning models

- Control system design and autonomous systems
- e) The Testbed is an important resource for both students and professionals. It enables them to undertake projects that require high-speed computing and large datasets.
 - f) Innovators can also use the Testbed to test their products in a controlled environment, ensuring they work well before being released into the market.
 - g) The testbed enables testing for network security and software vulnerabilities, ensuring safe and secure deployment.
 - h) The Testbed allows for the integration of various hardware and software systems to create comprehensive ICT solutions.

2. SCOPE

This document provides guidelines, rules, and procedures for the operation and access of the Testbed. It is designed to ensure that researchers, innovators, academia, and industry professionals can effectively utilize the Testbed's capabilities, maximizing its value for innovation and research.

The document shall be reviewed periodically to ensure it remains up-to-date and responsive to evolving technological and operational developments.

Any changes made to the document shall be published, with adequate advance notice of their implementation for those affected to take any required action. These changes shall be clearly described for each new edition of the document.

3. EXPECTED OUTCOMES ON USAGE OF TESTBEDS

- (i) **Improved Research and Innovation Capacity in Uganda:** Institutions, innovators, and students gain hands-on experience and build skills in testing and developing emerging technologies.
- (ii) **Accelerated Development and Adoption of Emerging Technologies:** Local solutions based on AI, 5G, IoT, robotics, and VR/AR are developed, piloted, and refined for real-world application.
- (iii) **Evidence-Based Policy and Regulatory Development:** Insights from Testbed projects inform national ICT policies and regulatory frameworks, making them more responsive to technological advancements.
- (iv) **Increased Local Production and Commercialization of ICT Solutions:** Tested prototypes and innovations are refined and transitioned into market-ready products and services, supporting the growth of local tech enterprises.

- (v) **Enhanced Collaboration Among Academia, Industry, and Government:** The Testbed becomes a hub for multi-stakeholder partnerships, joint research, and shared innovation efforts.
- (vi) **Reduction in Time and Cost for Technology Development:** Innovators and researchers can test and validate concepts without investing heavily in infrastructure, accelerating product development cycles.
- (vii) **Improved Cybersecurity Awareness and Resilience:** Use of the Testbed for security testing helps improve the safety and resilience of digital products and networks.
- (viii) **Strengthened Positioning of Uganda in Regional and Global Innovation Networks:** Participation in federated testbeds and publishing of research raises Uganda's profile in international ICT research and innovation spaces.
- (ix) **Inclusive Access to Innovation Resources:** Women, youth, and underrepresented groups are empowered to participate in tech development through equitable access to the Testbed.

4. PERFORMANCE & IMPACT EVALUATION

UCC shall adopt a structured approach to monitoring the Testbed's performance to ensure effective oversight and drive continuous improvement. This will involve collecting, analysing, and reporting on Key Performance Indicators (KPIs) to evaluate operational efficiency and assess the Testbed's impact on research, innovation, and policy development.

4.1 Operational Efficiency KPIs

These indicators will track the effectiveness and reliability of the Testbed's infrastructure and service delivery.

KPI	Description	Means of Verification (MoV)
System Uptime (%)	Percentage of time the Testbed is operational and available to users	System logs, uptime monitoring reports
Average Resource Utilization Rate (%)	Proportion of Testbed resources actively used versus total available	Automated resource usage analytics, capacity reports
Mean Time to Resolve Technical Issues (hrs/days)	Average time taken to resolve user-reported technical problems	Helpdesk logs, incident response reports, user feedback
Scheduled vs. Actual Downtime (hrs/month)	Comparison between planned maintenance time and unplanned outages	Maintenance schedules, outage incident logs

Number of Concurrent Users Supported	Maximum number of users served simultaneously without performance degradation	System usage reports, session logs
User Satisfaction Score (%)	Overall user satisfaction rating based on experience with the Testbed	Periodic user surveys, satisfaction evaluation forms
Number of Feedback or Evaluation Sessions Held	No. of formal engagements held to gather user feedback and discuss challenges	Meeting minutes, feedback session reports, user engagement logs

4.2 Impact of Usage KPIs

The KPIs assess the Testbed's contribution to knowledge generation, product development, and national capacity building, and are directly linked to the expected outcomes outlined in Section 3.

No.	Expected Outcome	Related KPIs	Means of Verification (MoV)
1.	Improved research and innovation capacity in Uganda	- No. of researchers/ innovators/ students supported annually - No. of projects completed	Training attendance, project registration forms, final reports
2.	Accelerated development and adoption of emerging technologies	- No. of new technologies piloted - No. of prototypes developed using Testbed	Project reports, trial summaries, dashboards
3.	Evidence-based policy and regulatory development	No. of policy briefs/ recommendations produced	Policy briefs, advisories, consultation reports, papers, publications
4.	Increased local production and commercialization of ICT solutions	No. of prototypes transitioned to commercial solutions	Test results, commercialization agreements
5.	Enhanced collaboration among academia, industry, and government	- No. of partnerships signed - No. of joint projects implemented	Signed MoUs, collaborative reports
6.	Reduction in time and cost for technology development	- Average time from concept to prototype - Resource utilization rate (%)	Timelines, usage reports, baseline assessments Surveys, feedback forms
7.	Improved cybersecurity awareness and resilience	No. of cybersecurity tests/assessments conducted	Security audit reports, test logs
8.	Strengthened positioning of Uganda in global innovation networks	No. of international publications or collaborations referencing the Testbed	Citation databases, MoUs, publication records

9.	Inclusive access to innovation resources	% of users from underrepresented groups	Demographic data, access logs
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5. USE CASES

Below is a summary of the potential use cases currently supported by the Testbed.

1. **Network Testing and Simulation (4G/5G):** A specialized 5G and 4G testing solution can simulate and test mobile network conditions, handover procedures, and mobility management in controlled 4G and 5G environments. It supports both standalone (SA) and non-standalone (NSA) 5G modes with 4x4 MIMO capabilities. With 4G/5G mobile equipment, users can test application compatibility, performance, and functionality across various mobile platforms.
2. **AI and Machine Learning Development:** High-performance devices with advanced GPUs can be utilized for deep learning, AI algorithm training, and high-performance computing. Additionally, low-power devices are available for experimentation and deploying AI and machine learning applications, especially in IoT environments. The current setup includes frameworks for model building, research, training, and deployment, with support for distributed training, mobile deployment, and cloud integration.
3. **IoT and Edge Computing Development:** Single-board computers, combined with IoT development kits and sensors, are well-suited for prototyping, automation, and building smart agriculture and IoT systems. These sensors enable environmental monitoring, data visualization, and real-time control, supporting a variety of smart and automated applications.
4. **Creative Content Development (Video, Audio, Graphics, AI):** High-performance computers can be utilized for advanced content creation, video and audio production, and graphic design. They leverage powerful processors, graphics capabilities, and neural processing units for tasks involving AI, machine learning, and neural network model development. Mobile camera stabilizers and cameras are available for capturing high-quality video and photos, particularly useful for documenting testbed setups, experiments, and results.
5. **Immersive Experiences & VR Application Testing:** A virtual reality headset supports testing VR applications, providing immersive experiences and simulation environments within a testbed setting.
6. **Robotics and UAV Testing:** Drones and robotic devices can be deployed for aerial imaging, surveillance, and robotic testing in automation and IoT-enabled environments. These tools enhance capabilities for remote monitoring, data collection, and testing in various applications.

7. **3D Printing and Prototyping:** The 3D Printer can be used for prototyping custom components in various testbed projects, especially for hardware experimentation and rapid design testing.

6. ELIGIBILITY, ACCESS & MANAGEMENT

6.1 Eligibility

The Testbed facility, located at the Uganda Institute of Communications Technology (UICT) Nakawa, is available free of charge to innovators, researchers, academic institutions, and industry professionals.

To maintain its focus on fostering innovation and technological advancement, commercial use of the facility, such as conducting paid tests for third parties, is strictly prohibited. Mechanisms will be implemented to enforce these restrictions, including monitoring and the auditing of Testbed usage. Violations will result in penalties, including potential suspension of access.

6.2 Access to the Testbed

- (i) Eligibility and Access: To request access to the Testbed, users can complete a reservation form available on the UCC Testbed website (www.testbed.ucc.co.ug). Access will be granted based on availability and scheduling, subject to approval by UCC. The procedure for applying to use the Testbed and the corresponding application evaluation criteria are outlined in *Annexes A and B*, respectively.
- (ii) Priority Access Policy: Access is generally granted on a first-come, first-served basis, except for cases requiring priority access for high-value research projects. *Annex C* provides examples of such projects.
- (iii) Duration of Access: Users will be granted access for a specific period based on the nature and scope of their projects. To maintain equitable access, users can request an extension of their allocated time by providing a justification. Extensions will be considered based on availability and the need to prevent monopolization of resources. A fair-use policy will be maintained to ensure equal opportunity for all users.
- (iv) Prior to accessing the Testbed, users must demonstrate the necessary skills and knowledge to operate the tools, software, and equipment they intend to use. This ensures efficient, safe usage of the Testbed resources and helps prevent misuse or damage.

- (v) **Resource Library:** A comprehensive collection of guides, manuals, and Frequently Asked Questions (FAQs) will be available to support users in operating the technologies available within the Testbed. These resources are designed to assist both beginners and experienced professionals in maximizing the benefits of the Testbed.

6.3 Facility Management

- (i) **Daily Operations and Oversight:** UCC, in partnership with other stakeholders, will oversee the Testbed's daily operations to ensure all equipment functions properly and provide technical support to users. Responsibilities will include managing user access, scheduling, and addressing any operational challenges that may occur.
- (ii) **Technical Support:** UCC, in partnership with other stakeholders, will provide on-site and remote technical assistance to users, helping them troubleshoot issues, operate equipment safely, and resolve technical challenges. This ensures users can maximize the Testbed's potential for their research and innovation activities.
- (iii) **Equipment Maintenance:** Regular inspections and maintenance of the equipment will be conducted to ensure optimal performance and reduce downtime. UCC will ensure that all systems are kept up-to-date and aligned with the latest technology standards.
- (iv) **Health and Safety Compliance:** The facility management team will ensure that the Testbed complies with all health and safety regulations. This includes ensuring that equipment is used safely and that the physical environment is conducive to research and innovation activities.

7. USER RESPONSIBILITY

- (i) **Ethical and Responsible Use:** All users are required to utilize the Testbed responsibly, adhering to guidelines on ethical research practices, data privacy, and safety regulations. This is to ensure that the Testbed remains a safe and productive environment for all users. **Strict adherence to the laws such as the Personal Data Protection and Privacy Act 2019, The Computer Misuse Act, and other laws is required.**
- (ii) **Intellectual Property (IP) Rights:** Users retain full ownership of intellectual property resulting from their research conducted within the Testbed.

In joint or collaborative projects, IP ownership and related rights must be clearly defined before the project begins. Agreements should specify the roles, contributions, licensing terms, and rights of all participating parties.

Key considerations for such agreements include:

- 1) **Joint vs. Individual Ownership:** Project partners must agree on whether the IP will be jointly owned or individually assigned.

- 2) Rights-Sharing Arrangements: Agreements may include provisions such as co-ownership clauses, exclusive or non-exclusive licensing, or royalty-sharing models.
 - 3) Formal Agreements: All joint initiatives must be supported by formal agreements outlining each party's roles, responsibilities, rights, and expectations regarding IP, publication, and commercial use.
- (iii) Documentation Requirements: To safeguard the rights of all parties, users must ensure proper documentation of project scope, contributions, data ownership, and agreed IP terms prior to access. UCC may require periodic updates or declarations to ensure ongoing compliance with these terms.
- (iv) Dispute Resolution: In the event of disputes related to IP ownership or data usage, the matter shall first be addressed through internal mediation facilitated by UCC. If unresolved, parties may refer the dispute to an independent arbitration body agreed upon by all stakeholders. The outcome of such processes shall be binding and aimed at preserving the integrity of the research environment.
- (i) Liability and Indemnification: Users will be held accountable for any damage or loss incurred during their use of the facilities. They may be required to indemnify the Testbed administrators, UCC or any other relevant authority against any claims or damages resulting from their activities. This is to ensure that the Testbed remains a valuable and secure resource for technological advancement and research.

8. SHARING OF TEST OUTCOMES

As part of its regulatory and policy advisory and development mandate, UCC may request access to research findings and related data generated using the Testbed resources. This access will be limited to non-commercial purposes and used solely in the interest of public policy and strategic planning.

9. CONFIDENTIALITY & DATA PROTECTION

To protect the integrity of research and innovations conducted at the Testbed, robust confidentiality and data protection measures have been established.

9.1 Confidentiality

- (i) Confidentiality Agreements: All users must sign confidentiality agreements before they are granted access to the Testbed. These agreements will clearly define each party's responsibilities in maintaining the confidentiality of sensitive information, ensuring that research concepts, innovations, and ideas are protected.

- (ii) Non-Disclosure Provisions: Users will also be required to adhere to non-disclosure provisions, ensuring that any information accessed or shared within the Testbed remains protected and confidential.

9.2 Data Protection and Security

Data protection and security practices shall comply with the Data Protection and Privacy Act, 2019 (Uganda) and shall draw on internationally recognized frameworks such as the EU General Data Protection Regulation (GDPR) and ISO/IEC 27001 standards for information security management.

These measures include:

- a) Encryption: All sensitive data shall be encrypted using industry-standard encryption methods, both at rest and in transit. The encryption approach shall comply with applicable national regulations and internationally recognized data protection frameworks.
- b) Secure Access Controls: This shall be maintained through authentication and authorization mechanisms aligned with international best practices. Examples include role-based access, strong password policies, and multi-factor authentication. Access rights will be granted based on user responsibilities and reviewed periodically to ensure integrity and accountability.
- c) Data Isolation: Each participant's data will be stored in isolated environments to ensure privacy and prevent data breaches. This ensures that no entity can access another's work without proper authorization.

9.2.1 Security Audits and Compliance

- (i) Regular security audits shall be conducted at least bi-annually to assess compliance with the stated standards and to identify and mitigate vulnerabilities.
- (ii) UCC or its appointed agents may conduct independent compliance audits to verify that data protection measures align with national and international requirements.
- (iii) Incident response procedures will be in place to handle data breaches promptly and effectively.

9.2.2 Data Storage and Disposal

- (i) Data collected or processed through the Testbed will be retained only for the duration necessary to fulfil research or regulatory purposes.
- (ii) Retention periods for sensitive data will be defined in consultation with users and in accordance with applicable legal and ethical requirements.

- (iii) Upon project completion or expiry of the retention period, data will be securely deleted or anonymized, following recognized best practices.

9.3 Data Usage Policies

- (i) Terms of Use Agreements: Before gaining access to datasets or APIs, all users must sign terms of use agreements, committing to responsible data handling. These policies are designed to protect the Testbed's resources and ensure that all research complies with legal and ethical standards.
- (ii) No Unauthorized Sharing: Data and resources accessed through the Testbed cannot be shared with third parties without explicit permission. Users must use the data solely for the approved purposes outlined in their project proposals.

10. REPORTING

10.1 Monitoring & Reporting Requirements

To ensure the Testbed operates efficiently and delivers maximum value to the ICT community, a systematic monitoring and reporting process shall be implemented.

- (i) User Registration: Before accessing the Testbed, users must complete a detailed registration process. This will capture essential information, including:
 - User identity and affiliation - Allowed identification includes National ID, Driving Permit, Passport and organisational/Work ID.
 - Project objectives
 - Planned resource usage (e.g., hardware, software, datasets)
- (ii) Access Logs: The Testbed will maintain logs of user activities, such as login times, duration of use, and resources utilized. These logs will be periodically reviewed to monitor adherence to the facility's policies and ensure that resources are being used appropriately.
- (iii) Resource Utilization Tracking: The Commission will use automated systems to track the utilization of the Testbed's resources. This data will help identify:
 - Patterns of usage
 - Peak times of resource demand
 - Opportunities for optimizationThis tracking will ensure that the Testbed remains efficient, with resources allocated where they are most needed.
- (iv) Progress Reporting: To ensure effective oversight of projects conducted within the Testbed, all users shall be required to submit periodic progress reports detailing the status, achievements, challenges, and next steps of their activities.

(1) Reporting Metrics and Timelines

Progress reports shall be submitted on a monthly or project-phase basis, depending on the project duration and complexity, as determined at the time of approval. Reports must include, at a minimum:

- Project milestones achieved;
- Resources utilized (hardware, software, datasets);
- Summary of experimental results and outcomes;
- Challenges encountered and mitigation actions;
- Plans for the next reporting period.

(2) Standardized Template

A standard reporting template will be provided by UCC to guide users in structuring their submissions. This will ensure consistency, completeness, and ease of evaluation across projects.

(3) Evaluation Sessions

UCC shall convene periodic evaluation sessions with Testbed users either virtually or in person to review progress, provide technical and administrative feedback, and realign on deliverables where needed. These sessions will also serve as an opportunity to troubleshoot challenges and ensure that projects remain aligned with Testbed objectives and national priorities.

10.2 Feedback Mechanisms

To continually improve the Testbed's services and ensure user satisfaction, the following feedback mechanisms will be implemented:

- (i) **User Feedback Surveys:** Regular surveys will be conducted to gather input on user experiences. This feedback will be analyzed and used to guide improvements to the Testbed's facilities and services.
- (ii) **Support and Troubleshooting:** A dedicated support team will be available to assist users with any technical or operational issues. Users can report problems through a centralized system, ensuring that issues are resolved promptly and documented for future reference.

11. COLLABORATION

UCC will work with various stakeholders and partners in line with its stakeholder engagement framework. When partnering with individuals or organizations on Testbed-related activities such as operations, funding, or capacity building, all parties will sign an agreement. This agreement will clearly outline the roles and responsibilities of each partner to ensure transparency and smooth collaboration.

12. USER ORIENTATION AND CERTIFICATION

To support safe and effective use of the Testbed, UCC may require users to participate in a brief orientation session prior to accessing the facility. This session would be designed to familiarise users with Testbed procedures, safety practices, equipment handling, and general user responsibilities. Where necessary, users may also be asked to complete a short proficiency assessment.

Additionally, in collaboration with academic and training institutions, the Testbed may facilitate optional certification opportunities for users engaging with advanced technologies. These certifications would be managed by partner institutions and are intended to enhance the skills and professional profiles of participating users.

UCC's role remains strictly focused on providing and maintaining the Testbed infrastructure and ensuring that it is accessible, secure, and aligned with national research and innovation objectives.

13. INTEROPERABILITY AND FEDERATION

All Testbed components and systems shall adhere to international standards and protocols to ensure seamless interoperability. The Testbed will support a range of ICT technologies, including 4G, 5G, IoT, AI, AR/VR, and more, by using widely accepted interfaces and communication protocols. This will enable different systems and devices to work together efficiently within the Testbed environment. The Commission shall continuously update and maintain the interoperability standards to align with global technological advancements, ensuring that the Testbed achieves its objective as a facility for research and innovation.

In preference to prescribing specific protocols, the Testbed will adopt flexible, modular approaches guided by:

- Standard categories such as application programming interfaces (APIs), messaging protocols, identity frameworks, and data exchange formats;
- International frameworks for testbed federation and network interoperability (e.g., those issued by ITU-T, 3GPP, IEEE, and other relevant bodies);
- Open standards and industry best practices that allow for compatibility with evolving technologies and future upgrades

In addition, the Testbed shall establish linkages with other national and international research facilities to foster a federated testbed ecosystem¹. These federated arrangements

¹ A federated testbed ecosystem refers to a collaborative network of independently managed testbeds that are interconnected to enable shared access to resources, joint experimentation, and coordinated research activities across institutions, regions, or countries. Each testbed in the federation maintains its

will enable collaborative research, shared infrastructure use, and cross-border experimentation. Formal cooperation agreements will define the terms of engagement, including data-sharing mechanisms, access protocols, and mutual responsibilities, while ensuring alignment with global interoperability and federation principles.

14. COMPLIANCE WITH REGULATIONS AND GUIDELINES

All testbed users are required to comply with applicable communications laws, including but not limited to spectrum regulations, privacy laws, and the Testbed's established guidelines. Periodic audits will be conducted to verify adherence to these regulations and guidelines. Users are expected to fully cooperate during these audits.

Non-compliance with the Testbed guidelines may lead to suspension or termination of access and, if warranted, legal action.

15. SAFETY AND ENVIRONMENTAL COMPLIANCE MEASURES

To ensure a safe and compliant operational environment, all users of the Testbed are required to adhere to the following safety and environmental measures. These are aligned with international best practices, particularly those adopted by national and international testbeds. Details are provided in *Annex D*.

own autonomy, but follows agreed standards and protocols to ensure interoperability, data sharing, and mutual support.

ANNEX A: Procedure for applying to use the Testbed

- i. Application Process - Applicants will fill out a detailed online form available on the Testbed's website (www.testbed.ucc.co.ug), providing:
 - a. A project abstract (maximum 200 words).
 - b. Detailed objectives and expected deliverables.
 - c. A proposed timeline with milestones.
 - d. Specific testbed resources required (e.g., equipment, software, bandwidth).
- ii. Approval Process
 - a. The projects technical feasibility will be evaluated and resource demands and availability.
 - b. The Testbed management team will review each request and either approve or deny it. Approved applicants will receive formal confirmation, including details of resource allocation, while those whose applications are denied will be promptly notified.
- iii. Granting access
 - a. Successful applicants can access the Testbed. They must provide identification as highlighted in the guidelines for access.
 - b. They must demonstrate that they read and understood the guidelines for Testbed access and use
 - c. They must also demonstrate that they understand the operational procedures for the equipment and software they would like to use
 - d. They must sign a non-disclosure agreement (NDA) before utilising the Testbed resources and fill out a feedback form after using the resources

ANNEX B: Application Evaluation Criteria

- i. Does the application identify which testbed capabilities and resources are required?
- ii. Are the proposed methods achievable within the testbed's current capabilities?
- iii. Does the project align with the testbed's mission to advance research and innovation in ICTs ?
- iv. Is the project likely to contribute to significant scientific, industrial, or societal advancements?
- v. Are the requested resources reasonable and available in terms of duration and intensity?
- vi. For repeat users, have they demonstrated responsible and effective use of the testbed in past projects?

ANNEX C: Examples of High-Priority Projects

High-priority projects are those that align with national strategic interests, support regulatory development, or demonstrate significant potential for societal impact. While the Testbed remains open to a wide range of users, the following are considered examples of high-priority projects that may be granted preferential access:

- (i) **Regulator-Sponsored Research:** Projects initiated or supported by UCC to inform policy and regulatory decisions.
- (ii) **Public Health and Safety Innovations:** Pilots using emerging technologies to address public health, emergency response, or disaster resilience (e.g., early warning systems, mobile diagnostics).
- (iii) **National Infrastructure and Smart Services:** Initiatives that support Uganda's digital transformation agenda, including smart agriculture, e-governance platforms, or digital public services.
- (iv) **Academic Research with National Impact:** University-led studies or prototypes addressing critical national challenges, particularly those focused on inclusive access, sustainability, or affordable innovation.
- (v) **Standards and Interoperability Testing:** Experiments contributing to national, regional, or international standards development in areas like 5G, cybersecurity, or broadcasting.
- (vi) **Strategic Industry Pilots:** Innovation-driven pilots from industry, particularly startups or SMEs, that offer scalable or locally manufactured solutions aligned with national priorities.
- (vii) **Time-Sensitive or Crisis Response Projects:** Projects requiring urgent testing or deployment to address emergencies, such as health pandemics or network disruptions.

These examples are illustrative and not exhaustive. The Commission may exercise discretion in determining the priority level of submitted projects based on their relevance, urgency, and alignment with the national development agenda.

Annex D: Safety and environmental compliance

D.1 Emergency Response Procedures

- (i) A list of emergency numbers (e.g., fire, medical, technical support) shall be displayed prominently at all major access points within the Testbed facility.
- (ii) Designated evacuation routes and procedures in the event of a fire, electrical fault, or any other emergency will be provided during user orientation.
- (iii) Fire extinguishers, smoke detectors, and alarms are installed on-site. Users shall not tamper with this equipment.
- (iv) First aid kits shall be available on-site. A list of trained first aid personnel is maintained and accessible. In the absence of a trained first aid officer, users must immediately contact the nearest available health facility or call emergency services, as indicated on the emergency contact list.
- (v) Any accidents, injuries, or near misses must be reported immediately to the designated safety officer using the official incident report form.

D.2 Equipment Safety Protocols

- (i) Only authorised and trained individuals may operate specialised Testbed equipment.
- (ii) Users are required to conduct pre-use inspections of equipment and report any malfunctions or safety concerns before use.
- (iii) All equipment must be operated within its manufacturer-specified limits. Overloading or unauthorised modifications are prohibited.
- (iv) The Testbed Maintenance Team will maintain logs of all inspections, repairs, and upgrades to ensure traceability.
- (v) Safety signage and protective measures must be observed at all times, particularly for high-voltage or heat-generating equipment. Where RF equipment is in use, appropriate shielding and safety practices must be followed. In cases where RF equipment is minimal or infrequently used, safety guidance should be provided on a case-by-case basis by the Testbed Management Team.
- (vi) Users must not attempt repairs or modifications to equipment unless explicitly authorised to do so.

D.3 Environmental Compliance

- (i) All users shall ensure proper disposal of electronic waste, batteries, and any hazardous materials. In the absence of specific national environmental regulations or Testbed protocols, users must follow internationally accepted best practices for e-waste handling and consult the Testbed Management Team for guidance.
- (ii) Energy conservation is encouraged. Users should power down devices when not in use. In the absence of formal server cooling or energy efficiency guidelines, users must follow general best practices, including avoiding equipment overuse, allowing proper airflow around devices, and promptly reporting overheating or ventilation issues to the Testbed Management Team.
- (iii) Where applicable, activities generating excessive noise or emissions should be scheduled in consultation with the Testbed Manager and carried out under controlled conditions. In cases where such activities are minimal or infrequent, general awareness and preventive measures shall suffice.
- (iv) Sustainable practices such as digital documentation, minimising printing, and environmentally responsible material use are highly encouraged.

D.4 Reporting Safety and Environmental Issues

- (i) All users must promptly report safety hazards, environmental concerns, or non-compliance incidents to the Testbed Management Team.
- (ii) Reports may be submitted in person, by email, or through an online reporting tool (to be provided via the Testbed website).
- (iii) Anonymous reporting is permitted where necessary, and no user shall be penalised for reporting in good faith.
- (iv) All reported concerns will be acknowledged, investigated, and addressed within a reasonable timeframe. Corrective and preventive actions shall be documented and implemented accordingly.

D.5 User Acknowledgment

All Testbed users shall acknowledge that they have read, understood, and agreed to comply with the above safety and environmental measures by submitting a digital acknowledgment form. This form will be made available via the Testbed website. Access to the Testbed may be restricted or revoked for non-compliance.