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MINISTRY OF IT & TELECOM

Ministry of Information Technology & Telecommunication

Standard Operating Procedures (SOPs) for Electronic Waste Management

Digital Economy Enhancement Project (DEEP)

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Abbreviations

BOI	Board of Investment
CPU	Central Processing Unit
DEEP	Digital Economy Enhancement Project
EHS	Environmental Health and Safety
EPA	Environmental Protection Agency
EPC	Environmental Protection Council
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
E&SFP	Environmental and Social Focal Person
ESS	Environmental and Social Standard
GIIP	Good International Industrial Practices
H/G/S	Health/Gender/Safety
HSE	Health, Safety and Environment
ICT	Information and Communication Technology
IEC	International Electro technical Commission
ISO	International Organization for Standardization
IT	Information Technology
MOITT	Ministry of Information Technology and Telecommunication
NADRA	National Database and Registration Authority
NEQS	National Environmental Quality Standards
NITB	National Information technology Board
PCB	Polychlorinated Biphenyl
PIUs	Project's Implementation Units
PMU	Project Management Unit
POPs	Persistent Organic Pollutants
PPE	Personal Protective Equipment
SOPs	Standard Operating Procedures
SVOCs	Semi-Volatile Organic Compounds
VOCs	Volatile Organic Compounds
WB	World Bank

1. Introduction

Digital Economy Enhancement Project (DEEP) is supporting activities that will increase access to and promote the use of digital services across Pakistan. The Project Development Objective (PDO) is to enhance the Government's capacity for digitally enabled public services delivery for citizens and businesses.

The project will also support cross-cutting improvements in the enabling environment—supporting reforms to expand broadband connectivity and to strengthen the policy and legal framework for the digital economy. DEEP will also enable institutional, policy, and regulatory global best practices through technical assistance to the management and implementation agencies—including the MoITT, NADRA, National IT Board (NITB), Board of Investment (BoI) and Ignite. Under the project, NADRA will build a data exchange layer for government agencies to exchange information securely, as well as provide citizens with a digital 'vault' to secure credentials. This is potentially transformative for increasing citizens' access to public and private services (everything from birth certificates to banking).

1.1.1. Project Description

Component 1: Improving digital economy, governance and service capabilities. This component will provide technical assistance to the Ministry of Information Technology and Telecommunications (MoITT) for policy and regulatory reforms to address regulatory and market failures in the country's connectivity infrastructure. It will include:

i. Right-of-Way (RoW) reforms, development, and adoption of a RoW-single-window, onboarding and change management of major civic agencies in the RoW-single-window, and development of RoW dispute resolution procedures.
ii. Broadband demand analysis and stimulation options to improve the affordability of smartphones and update of digital services.
iii. Broadband infrastructure mapping, assessment of market failures.
iv. Review and recommendations on the institutional and structural alignment of MoITT to meet emerging challenges and opportunities for digital transformation.
v. Nationwide stakeholder engagement, training, and workshops This component is divided into the following sub-components:

- **Subcomponent 1(a):** Development of key enablers for whole-of-government approaches: review and support the implementation of personal data protection laws and regulations; assess the cybersecurity baseline; support the implementation of the Pakistan Cloud first policy; develop and support the adoption of an Open Data framework; develop Pakistan Digital Government Institutional Framework; develop Pakistan Digital Government Enterprise Architecture; develop Pakistan Digital Government Data Governance and Interoperability Framework; support nationwide consultation, information sessions, training, and workshops for public sector staff, private sector, and civil society.

- **Subcomponent 1(b)**: Development and Implementation of Interoperability Exchange Layer: stock taking of existing sources of data in the country; building governance and institutional capacity; producing the detailed technical design and procurement documentation for the national data exchange layer; developing the technological infrastructure for the national data exchange layer; writing relevant documentation; and integrating prioritized databases and services.
- **Subcomponent 1(c):** Development of digital authentication, digital vaults, and digital wallets: define the most appropriate architecture for the digital authentication services; identify key services to be provided by the digital identification and authentication solution; deploy the prioritized services for the use of digital authentication; and creation of personal data vaults including feasibility, design and deployment, and awareness campaigns etc.
- **Subcomponent 1(d)**: National Digital Portal and Digital Services Collaboration: conducting an inventory of services; mapping business processes and regulations; providing advice on transitioning systems to cloud infrastructure; producing detailed technical designs and procurement documentation; developing new systems; and supporting knowledge transfer.
- **Subcomponent 1(e)**: Civic Innovation: Design Testing, Communications and Outreach; Digital Inclusion for Women and Girls; Digital Government Fellowship.

Component 2: Pakistan Business Portal. This component will support the Board of Investment (BoI) to modernize regulatory regimes in Pakistan at three levels of government: federal, provincial, and municipal. The first stage entails reviewing, mapping, and developing a catalogue of registrations, certificates, licenses, and others (RLCOs) across the three levels of the government, potentially including up to 800 government agencies relevant to dealing with investing and operating businesses in Pakistan. Activities for establishment of PBP will include stock taking and reform recommendation for simplifying, streamlining, and improving existing regulatory requirements for investing and operating business across Pakistan; digitalization of compliance with regulatory approvals; institutionalizing the reform process as well as the management and upgradation of PBP; and Communicating reforms and transitions to PBP.

Component 3: Project management. This component will cover the establishment of Project Management Units (PMU).

The project will require extensive use of electronic equipment, including computers, servers, tablets, networking devices, printers, and data storage systems. Over time, the utilization and disposal of such equipment will produce electronic waste (e-waste), which, if not properly managed, presents considerable environmental and public health hazards. E-waste comprises toxic heavy metals/ substances, including lead, mercury, and cadmium, which can pollute land, air, and water, posing a risk to human health when disposed of improperly.

1.1. NEED FOR E-WASTE SOPS

In response to these challenges, project has developed Standard Operating Procedures (SOPs) for E-waste Management as an integral component of its environmental and social management commitments under the project. These SOPs delineate explicit protocols for the procurement, operation, storage, repair, reuse, recycling, and ultimate disposal of electronic equipment. They guarantee that all management and implementation entities adopted sustainable techniques that mitigate hazards to human health and the environment, while also advancing circular economy principles such as equipment refurbishing, responsible recycling, and material recovery.

By integrating these SOPs throughout DEEP's entities (PMU and PIUs), the project will ensure that its transformative digital outcomes are achieved in a socially responsible and environmentally sustainable manner. The SOPs will enhance institutional accountability, capacity building, and the promotion of certified recycling methods in Pakistan, while also protecting ecosystems and communities.

Legislative Framework

Projects funded by the World Bank (WB) must adhere to the Environmental and Social Framework (ESF), which ensures the effective management of environmental and social risks throughout the project lifecycle. To implement this, each project develops an Environmental and Social Commitment Plan (ESCP)—a legally binding agreement between the Borrower and the World Bank.

The ESCP delineates explicit procedures and actions required to mitigate environmental and social risks. For the project, an agreed action within the ESCP is the development and implementation of Standard Operating Procedures (SOPs) for E-waste Management.

In addition to WB ESF, these SOPs are consistent with:

- Pakistan Environmental Protection Act (1997) specifically section 11-14, National Hazardous Waste Management Policy (2022), National Environmental Quality Standards (NEQS) provide the legal framework for handling, storage, and disposal of hazardous electronic waste.
- Extended Producer Responsibility (EPR) Principles: It stipulates the responsibility of the manufacturers and importers to collect/take-back, and dispose of the electronic products in an environmentally sound manner.
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes (1989)- (amended-1st January 2025) the scope and prohibits illegal dumping/export of e-waste to developing countries; requires prior informed consent for cross-border movement.

1.2. OBJECTIVES OF E-WASTE SOPS

To guarantee compliance, DEEP's e-waste management practices must adhere to both national regulations and the WB ESF specifically, ESS3 on Resource Efficiency and Pollution Prevention. Objectives are as follows:

- To promote safe handling of equipment: Provision of clear instructions for the safe use, storage, collection, and segregation of electronic equipment to minimize risks to human health and the environment.
- To ensure environmentally responsible disposal: Implementation of SOPs for the reuse, recycling, and ultimate disposal of electronic waste via licensed and accredited suppliers, in line with worldwide best practices.
- To encourage resource efficiency: Encouragement of repair and material recovery to extend the life cycle of ICT equipment and reduce the volume of e-waste.
- Standardize practices across PMU &PIUs. Further, to ensure that PMU and all PIUs adopt consistent and uniform procedures for managing e-waste.
- To strengthen capacity of project staff: Capacity building and training of project staff including all technical staff, procurement specialist and E&S focal persons in all PIUs on sustainable e-waste management practices.
- To support sustainable digital transformation process: Integration of environmental sustainability into DEEP's digital initiatives, ensuring that technological advancements contribute to green and inclusive digital development.

1.3. METHODOLOGY

The development of the E-Waste Management SOPs under the DEEP followed a structured, systematic and consultative process to ensure compliance with national regulations and the WB ESF policy. The methodology included the following steps:

- Review of National Regulations: Examination of national environmental legislation, Environmental Protection Agency (EPA) guidelines, and international best practices on e-waste management to establish the baseline framework.
- Consultations of Stakeholders: Consultation with the EPA regarding guidelines of E-waste recycling and disposal of e-waste (development of e-waste management SOPs), continuous engagement and guidance with the E&S team of the World Bank, and with E&S Focal Persons and Procurement Specialist from all PIUs to identify risks, institutional requirements, and practical solutions. See **Annex 1G** for detailed consultation which has been done for the development of SOPs.
- Assessment of Existing Practices: Review of existing e-waste handling and disposal practices within PMU and PIUs, with a focus on ICT equipment use under DEEP.
- Benchmarking of Best Practices: Reference to international conventions and guidelines, such as the Basel Convention, Good International Industrial Practices (GIIP) and World Bank-financed projects, to adapt relevant approaches to the local context.
- Drafting and Validation: Preparation of draft SOPs based on collected inputs, followed by circulation among stakeholders for review, feedback, and finalization.

2. SOPs for E-Waste Management

Recommended SOPs, mitigation measures and monitoring templates along with responsible unit and compliance criteria, are delineated as follows with attached Annex 1A to Annex 1G. The proposed operating procedures and mitigation measures line up with Good International Industrial Practices (GIIP), Basal Convention technical and industrial guidelines.

The SOPs are divided into five sections:

1. Design and Procurement Process of New Equipment
2. Installation Phase of Equipment
3. Operational Phase
4. Dismantling of Used Equipment
5. Final End-of-Life Disposal of Equipment

SECTION 1: DESIGN AND PROCUREMENT PROCESS OF NEW EQUIPMENT

The objective of design phase measures is to extend equipment lifespan, reduce future e-waste, and highlight the priority of procuring equipment with recyclable components, confirming compliance with regulatory procedures and requirement. Bidders/suppliers must explain that the ICT equipment supports e-waste reduction during DEEP's operational stage and guarantee infrastructure is resilient to shocks, noise, vibrations, and natural hazards like floods, earthquakes etc. Detailed measures with monitoring plan are also outlined in ANNEX 1.

1. **Product Evaluation**:
    - Collect data on product lifecycle (expected shelf life, reparability, durability).
    - Ensure compliance with national/international energy efficiency and environmental labeling standards.
    - Project will explore and consider green procurement including potential buyback option as a part of ICT equipment procurement contact provisions – surety bond etc. - to ensure extended producers' responsibility (EPR) for taking back the end-of-life IT products and safe disposal with reporting and traceability.
    - Assess the current inventory (Annex 1B and 1C) to identify any existing electronic equipment that can be repurposed or recycled.
    - Evaluate electronic equipment based on its environmental impact, including energy efficiency, storage life, useful life, end-of-life (EoL), recyclability, and use of hazardous materials.
    - Give preference to products with eco-label certifications and those that comply with international environmental standards.
    - Carbon Footprint of Equipment: Equipment to be procured and installed will be energy efficient and meet environmental performance requirements with respect to energy use.

- Bids evaluation to consider that computers, servers, laptops, and other ICT equipment must qualify to carry Energy Star labels or equivalent labelled low voltage electrical appliances.
- Technical specifications in bids/contracts to identify recyclable/non-recyclable and hazardous/non-hazardous equipment or component of equipment.
- Technical specifications in bids/contracts will provide details about how equipment will be safely disposed of at the end of life.

2. **Vendor Selection Criteria**:
    - Selecting vendor/s must primarily include compliance with the Pakistan Environmental Protection Act (PEPA 1997)–EPA Certified Vendor, National Hazardous Waste Management Policy, 2022, and subsequent regulations and policies related to e-waste management.
    - Require suppliers to disclose material composition and end-of-life classification, specifying whether it is hazardous, non-hazardous and recyclable or non-recyclable.
    - Suppliers must provide Bill of Materials (BoM), detailing metals (gold, copper, cobalt, lithium, lead), optics, and sensors.
    - Preference for vendors offering environmentally friendly designs, durable and repairable products with sustainable certifications.
    - Suppliers of laser printers and copiers must guarantee that their equipment is compatible with high-quality recycled paper. Copiers or printers must provide duplexing (double siding).
    - Successful bidder to confirm to take back the equipment when its useful life ends, thus providing an end-of-life buyback guarantee.
3. **Allocation of Devices (Post Procurement)**
    - The allocation of each electronic equipment will be made to the respective staff/designee by PMU and PIUs (template annexed 1B& 1C) through an official notification, and Information Technology (IT) or technical department of project mentioning the item name, its ID, date of allocation etc.
    - Prior to handing over the electronic devices to project management and implementation entities/staff/workers, IT and procurement unit of project will run electronic devices test.
    - All project management and implementation entities will notify any subsequent change in allocation/designee will be re-notified to IT and procurement department and movement record will be maintained in the inventory by IT department.
4. **Procurement Documentation & Inventory Management**
    - Document all procurement activities related to electronic equipment, including specifications, purchase orders, and invoices.
    - Specify and document storage life, useful life and end-of-life (EoL) of equipment.
    - Maintain detailed procurement documentation, including supplier disclosures and BoM.
    - The record of inventory will be maintained by PMU and PIUs (Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/Assistant

Director IT from PMU & PIUs respectively and procurement team of project) and PIUs will be share all proceedings with PMU on quarterly or biannual basis (template 1B and 1C annexed).

- The inventory will serve as a living document and will be updated periodically to record and document any subsequent changes (new procurement/transfer/wastage etc.).
- Maintain records of vendor certifications and compliance with e-waste regulations.
- Record EPR commitments and take-back agreements in contracts.
- Maintain inventory with tagging for tracking lifecycle and disposal.
- Update stock registers with device allocation, usage, and end-of-life planning.

SOPs for Auction:

- The disposal of assets through auction shall follow a transparent, open, public and competitive tendering process in line with the Public Procurement Act and Regulations.
- All interested bidders, preferably ISO 14001–certified (or equivalent) and EPA–certified (or equivalent), will be invited through public notice, required to inspect the assets prior to bidding on an "As and Where" basis, and submit sealed tenders with the prescribed deposit.
- Tenders will be opened publicly, evaluated strictly in accordance with the criteria published, and the contract will be awarded to the highest evaluated bidder, in compliance with applicable procurement and disposal regulation.
- Where appropriate, and subject to approval by the Project Steering Committee (PSC), alternative modes of disposal - including transfer or gifting of select equipment to eligible institutions or beneficiaries, may also be considered at the end-of-life stage of project, as per government rules.

SECTION 2: SOPS FOR INSTALLATION PHASE OF EQUIPMENT

The installation phase of the project will have activities that too pose minor to moderate environmental and social risks. Impacts of installation phase will primarily be related to waste generation, health and safety issues.

1. **Pre- Installation Check:**
   - Engage a qualified structural engineer to certify buildings for safe installation of sensitive equipment.
   - Ensure buildings are free from structural damage (cracks, loose wiring, leakage points, etc.).
   - Engineers must further certify that the building is earthquake-resistant.
   - Verify that workplaces requiring infrastructure improvements (e.g., wiring, cabling, air conditioner, partitions, roof repairs) comply with DEEP's e-waste management SOPs.
2. **Installation of Sensitive Equipment:**

- Handle all devices with anti-static precautions to avoid damage.
- Install equipment on stable, vibration-free platforms.
- Maintain adequate spacing for airflow, maintenance, and cleaning access.

3. **Waste Management**
   - Provide separate containers/boxes for collecting and storing different types of waste:
     - Construction-related waste: duct cuttings, wire pieces, metal clips, bolts, cable joints, insulation material, etc.
     - Packaging waste: cartons, foams (Styrofoam), plastics, packing strips.
     - Paper waste: printed manuals, product guides, warranty cards, safety instructions, etc.
   - Clearly mark storage areas to distinguish between useful and discarded materials.
   - Transport all waste to designated disposal sites on the same day; no open dumping allowed.
   - E-Waste generated (if any) during installation will be collected only by the Contractor, taken back for recycling, and will not be handled by PMU or PIUs.
   - Ensure e-waste is not mixed with general waste.
   - All waste (scrap, packaging) to be auctioned to certified waste/scrap dealers.
   - DEEP to avoid wasting paper by keeping all product-related documents under inventory control for reference; pack and label them properly for storage in storerooms.
4. **Good Housekeeping:**
   - Workers must follow a good housekeeping policy at all times.
   - Inform and train workers on the importance of cleanliness and waste segregation.
   - Ensure:
     - Mitigation measures for site cleanliness are implemented.
     - Rubbish and debris are removed at frequent intervals, leaving sites clean and tidy.
     - Food waste is removed daily to prevent pests.
     - Temporary signs, boards, and posters are removed immediately after work completion.
     - All work areas remain uncluttered and safe for movement.
   - Provide toilet facilities, canteens, and welfare amenities for installation workers, including those hired externally.

SECTION 3: SOPS FOR OPERATIONAL PHASE

The operational phase of DEEP will be important as this phase will continue to produce waste of different types including e-waste as well as posing risks to health and safety of staff. The operation of ICT equipment in closed or confined spaces will have several environmental impacts.

1. **Operational Phase: Impact on Air Quality**
   - Place printers, photocopiers, and fax machines only in designated, well-ventilated areas; avoid placing them in closed, unventilated rooms.

- Ensure mechanical ventilation systems are switched on at least 30 minutes before office hours and kept functional during use of IT/electronic equipment.
- For offices without mechanical ventilation, ensure regular natural air circulation by keeping windows and doors open when equipment is in operation.
- Prohibit placing ICT equipment in corridors, escape routes, or stairwells to avoid fire hazards and obstruction of emergency exits.
- Conduct quarterly servicing and preventive maintenance of office equipment to minimize emissions and overheating risks.
- Maintain indoor air quality logs to record ventilation checks and incidents of poor air quality.
- Carry out fire risk assessments twice a year, ensuring fire extinguishers and smoke detectors are available near IT-intensive areas.
- Install rodent-proofing measures (wire mesh for vents, sealing of entry points, periodic pest control) to prevent wire damage and reduce fire hazards.
- Train staff to identify signs of overheating or electrical faults and immediately report to facility management.

2. **Operational Phase: Waste Management:**
   - Provide separate, color-coded bins for: Paper waste; Plastic waste; E-waste (keyboards, mice, cables, cartridges, etc.) and Food waste.
   - Clearly label bins and place them at accessible points in all project's operational units.
   - Collect food waste daily and hand over to municipal waste collection; ensure it is never mixed with e-waste.
   - Collect general office waste (paper, plastics) weekly and move to the central waste storage area.
   - Store e-waste in a secure, designated storage space, separated from general waste, until collection/disposal through an authorized vendor.
   - Prohibit disposal of e-waste in municipal bins. All IT-related waste must follow national/provincial e-waste guidelines.
   - Introduce "reduce, reuse, recycle" practices:
     - Encourage double-sided printing (if printing is unavoidable).
     - Promote paperless workflows (digital forms, e-approvals, online records).
     - Reuse packaging material where possible.
     - Train all staff annually on waste segregation, recycling, and safe e-waste disposal practices.
     - Maintain a waste inventory register/log for: Paper waste; Food waste; Plastics; E-waste (with details of items, storage time, and disposal records).
     - Engage only authorized recyclers/disposal vendors for e-waste, ensuring compliance with PEPA and NEQS (National Environmental Quality Standards).
     - Use document shredders when confidential papers need disposal, and ensure shredded material is added to the appropriate paper waste stream.

SECTION 4: DISMANTLING OF USED EQUIPMENT

The dismantling of existing ICT equipment will be an essential component throughout the project lifecycle. This will largely result in environmental impact and societal challenges, including the discontinuation of services to users. The dismantling step will produce e-waste at PMU and PIUs. Due to cost against value considerations in handling, transportation, and temporary storage, it is not feasible to combine all e-waste for central disposal because some project operational units are located distant from one another. In order to facilitate local recycling and job prospects, it is preferable to dispose of e-waste at the office level using licensed or registered scrap dealer and recyclers. In this case, burning e-waste will be strictly forbidden, and SOPs listed in Section 5 shall be followed for final disposal. As only minor quantities of e-waste are expected to generate, these will be handed over to licensed recyclers/dealers who have the technical capability to recover precious and hazardous materials safely. During dismantling, dust may be generated in hard-to-reach points/spaces; cleaning and inspection of devices may release particulates, and printer/copier cartridges may release fine powders. These contaminants may settle or adhere to surfaces. No smoke or other gaseous pollutants are anticipated under normal operations.

To perform dismantling of electronic equipment, certified or experienced Manager Networks from MoITT, Hardware Engineers from NADRA, Director Infrastructure from NITB and Assistant Director IT from BoI, under the project must possess relevant technical safety certifications, such as Functional Safety (IEC 61508), Electrical Safety / Lock-Out Tag-Out (LOTO) training, ISO 45001 or an equivalent OHS certification or highly experienced in handling dismantling phase of equipment with supporting team, will be engaged/on boarded to carry out the dismantling process. They will ensure compliance with all relevant safety protocols, risk assessments, and regulatory requirements during dismantling, removal, and transportation of electronic equipment.

Dismantling phase measures will cover:

1. **Site Control & Supervision:**
    - Only EPA-certified dismantling facilities allowed.
    - Chain-of-custody documentation maintained for all incoming and outgoing waste.
    - Barcode/QR code tagging on bins for traceability.
    - Regular site inspections and compliance audits.
    - Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively (ISO 45001/OHS, Functional Safety IEC 61508, or LOTO or equivalent or experienced) will provide PPE (gloves, masks, goggles, safety shoes) to the team and train them on its proper use and train them on its correct usage.
    - Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively will be engaged to ensue all safety procedures, risk assessments, and regulatory OHS standards are met including:
        - Safe lifting techniques
        - Hazard awareness

- Fire and electrical safety procedures

- The PMU's Health/Gender/ Safety Consultant in PMU and E&S Focal Person in PIUs or HR department to arrange and coordinate health checkups (either onsite or through partner clinics), to ensure schedules, regular records and detailed follow-ups.
- Health/Gender/Safety Consultant in PMU and E&S Focal Person in PIUs in close coordination with HR and admin specialist will ensure that all workers keep their immunizations up to date (e.g., Covid-19).

2. Fire and Electricity Safety:

- The responsible Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively will maintain first aid kits and emergency contact numbers at dismantling sites.
- Fire prevention protocols, especially for Li-ion batteries (thermal runaway risk).
- Adequate grounding and electrical safety in dismantling areas.
- Availability of fire extinguishers (Class D[1] for metal fires, CO_2 for electrical fires).
- Develop and display evacuation plans.
- Conduct periodic emergency response drills (fire, electrocution, injury scenarios).
- Establish an incident reporting mechanism for accidents and near misses.

3. Safe Handling and Storage of Dismantled Material

- Segregate dismantled components into labeled bins/containers (plastics, metals, hazardous fractions, paper, cardboard, Styrofoam, etc.).
- Avoid stacking dismantled items beyond 3 feet.
- Dedicated storage for plastics, metals, Polychlorinated Biphenyl (PCBs), and Persistent Organic Pollutants (POP)-containing plastics.
- Battery storage under controlled temperature and humidity conditions.
- Spill prevention kits and containment areas for hazardous liquids.
- Maintain proper ventilation and conduct daily housekeeping at dismantling/storage sites.
- Prevent entry of rodents/insects in storage areas.
- Ensure weatherproof storage, with impermeable flooring to avoid seepage of hazardous materials.
- Mark storage areas for usable vs. discarded materials, with space for different categories.

4. Waste Segregation and Disposal

- E-Waste: Identify unusable equipment and implement the generic SOPs for e-waste management. Inventory of Dismantled ICT Equipment and E-Waste is attached in Annex 1D.
- Segregation at source: plastics, metals, PCBs, batteries, hazardous fractions.
- Recyclable Waste (plastics, metals, wood): Provide separate containers and hand over to certified scrap dealers.

[1] A Class D fire extinguisher is a type of extinguisher designed to combat combustible metal fires, which involve materials like magnesium, titanium, and sodium

- Paper waste, Cardboard, Styrofoam: Hand over dismantled packaging materials to a certified contractor.
- General Waste: Segregate, collect, and store separately; strictly no open dumping.
- All waste to be auctioned/handed over to certified recyclers or scrap dealers within 3 months with proper documentation of waste disposal routes and final treatment.
- Under no circumstances shall dismantled material be disposed in environmentally sensitive areas.
- Collaboration with certified recyclers for downstream processing.

5. Worker Safety and Training

- Provide workers with Personal Protective Equipment –PPE (gloves, masks, goggles, safety shoes) and train them on correct usage.
- Training on handling hazardous components (PCBs, lead, Li-ion).
- Conduct regular OHS training, including:
    - Safe lifting techniques
    - Hazard awareness
    - Fire and electrical safety procedures
- Awareness sessions on Prevention of Electronic Crime Act (PECA) 2016 for data-bearing devices.
- Conduct periodic health checkups for dismantling staff.
- Encourage workers to keep immunizations updated (e.g., Covid-19).
- Regular refresher training and mock drills.

6. Emergency Preparedness

- Maintain first aid kits and emergency contact numbers at dismantling sites.
- Develop and display evacuation plans.
- Conduct periodic emergency response drills (fire, electrocution, injury scenarios).
- Establish an incident reporting mechanism for accidents and near misses.

7. Good Housekeeping Practices

- Workers to be trained and informed about importance of housekeeping.
- Implement dust control measures with good ventilation and keep sites clean and tidy.
- Remove rubbish, food waste, temporary signs, and boards immediately after completion.
- Routine inspection of storage areas to avoid leaks or contamination.
- Periodic waste audits and record-keeping
- Provide workers with toilets, canteens, and welfare facilities.

8. Reuse & Auction of Dismantled Equipment

- Damaged/obsolete devices to be removed and stored for temporary storage and auction.
- No recycling at office level – e-waste to be sent to registered scrap dealers.
- Auctions held locally; large scrap volumes transported to registered and certified recyclers.
- Secure data sanitization on electronic equipment (PECA 2016 compliance).
- Transparent auctioning of reusable equipment through certified channels.

- Documentation of resale, reuse, and final disposal.
- Ensure auctions comply with registration requirements of: Federal Administration; Security Exchange Commission of Pakistan (SECP); Pakistan Engineering Council; MOITT and EPA.

SECTION 5: SOPS FOR FINAL END-OF-LIFE DISPOSAL OF EQUIPMENT

1. The products' useful life will be deliberated at the time of allocation on the device.
2. After the useful life of devices is completed IT or technical unit of project will retrieve the devices at the storage facility dedicated for discarded ICT equipment/e-waste for temporary parking before its, recycling, final disposal or auction. The potential bidders interested in buying e-waste shall be made responsible for selling the e-waste/old ICT equipment to certified ICT equipment recycling units/dealers. Annex 1E attached for reference.
3. After the segregation and safe storage of discarded parts of equipment, non-recyclable component would be handed over to government approved hazardous waste facilities or landfills. To accomplish this, maintaining disposal certificates and updating the inventory is essential to meet legislative requirements and ensure compliance.
4. Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively, in collaboration with H/G/S consultant in PMU and E&S Focal Person in PIUs will ensure that SOPs comply with national regulations regarding the disposal of electronic waste, including the proper handling of hazardous materials. Only EPA-approved facilities to operate (licensed, IEE/EIA cleared).
5. Informal sector integration through training, certification, and traceable partnerships.
6. **SOPs for E-Waste Value Chain (Collection Transportation, Dismantling, Reuse & Recycling)**
    - **Collection:**
        - Store e-waste in weatherproof facilities, on impermeable floors, with fire safety measures.
        - Segregate into two categories:
            - Sensitive Electronic Equipment – keep intact, store separately.
            - Other e-waste – stored collectively.
        - Workers must use PPE when handling.
    - **Transportation:**
        - Transport in impervious vehicles with spill kits.
        - Avoid breakage to prevent hazardous release.
    - **Dismantling:**
        - Follow manual dismantling methods only (no burning/chemicals).
        - Use PPE.
        - Steps include:
            - Removal of liquids and gases.
            - Removal of hazardous components (Hg switches, PCB).
            - Removal of valuable components (copper cables, metals, PCBs).

- Segregation of hazardous vs. non-hazardous parts.

- **Reuse**

The reuse strategy includes detailed processes for repairing equipment and managing assets throughout the project's duration and beyond.

- **Reuse and Repair**
  - *Collection Process*:
    - **Inventory Assessment**: Conduct an initial assessment to identify and catalogue all electronic devices and equipment.
    - **Collection Points**: Management unit and Implementing Units will provide designated collection points for old or unused electronic devices within the implementation areas.
    - **Transportation:** Project will arrange secure and environmentally friendly transportation of collected items to designated place.
  - ***Repairing Process:***
    - **Initial Inspection**: Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively will perform a thorough inspection to assess the condition of the collected devices.
    - **Data Sanitization**: Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively will ensure all data is securely erased to protect sensitive information.
    - **Repair and Upgradation**: Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively will facilitate in conducting from third party necessary repairs, replace faulty components, and upgrade hardware and software to meet current standards.
    - **Quality Testing**: Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively will rigorously test repaired devices to ensure they meet functional and safety standards.
    - **Certification and Documentation**: Certified vendor will provide a certificate of repair and maintain detailed records of the refurbishing process for accountability.
  - ***Distribution Process:***
    - **Reallocation**: Reallocate refurbished devices to areas where they are most needed within the project or as designated by the competent authority.
    - **User Training**: Offer training sessions for users to ensure they can effectively operate and maintain refurbished equipment.

- **Recycling & Recyclers:** Only EPA-certified recyclers and recycling facilities will be considered.
- **Assets Ownership and Management**
    - ***Ownership During Project:***
        - **Property Rights**: All electronic devices and assets purchased for the project will remain the property of the project or the concerned departments during the project's duration.
        - **Accountability**: PMU and all PIUs are responsible for the proper use and maintenance of these assets, adhering to project procedures and guidelines.
        - **Reclaiming Assets**: The Project reserves the right to reclaim assets in cases of unsatisfactory performance or violation of project guidelines by any project implementation entity.
    - ***Post –Project Ownership:***
        - **Completion and Handover**: Upon successful completion of the project or its components, the financed equipment will become the property of PMU and PIUs.
    - **Ongoing Continuous Maintenance:**
        - PMU and PIUs are responsible for the ongoing maintenance of these assets.
        - During the project life, maintenance should be covered by the project budget. After project closure, regular departmental budgets should fund the continued upkeep of these assets.

3. Implementation Arrangements:

3.1. ROLE OF HEALTH/GENDER/SAFETY CONSULTANT IN PMU

The Health/Gender/Safety Consultant in the PMU ensures that all project operations and activities comply with occupational health and safety standards and protocols. Consultant will develop and review e-waste management SOPs, provide technical guidance to relevant workers under the project, and support safe handling and disposal of equipment. The consultant conducts trainings periodically on e-waste SOPs for all E&S Focal Persons in PIUs and coordinates closely with Procurement Specialists, Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively, and Human Resource and Admin Specialists to ensure smooth implementation. Consultant will monitor progress, review compliance, and prepare reports, which would be submitted to world bank E&S team to ensure effective SOP adoption and alignment with national regulations and World Bank ESS requirements.

3.2. ROLE OF E&S FOCAL PERSON IN ALL PIUS

The E&S Focal Persons in all PIUs must be responsible for implementing e-waste management SOPs at the unit level, ensuring adherence to World Bank ESS standards and national

regulations. They will collaborate closely with the Health/Gender/Safety Consultant in PMU, Procurement Specialists, Certified or Experienced Manager Networks/Hardware Engineers/Director Infrastructure/Assistant Director IT from MOITT, NADRA, NITB, Ignite and BOI respectively, to ensure effective implementation. Their role includes monitoring daily adherence, maintaining records, reporting progress to the PMU, and supporting inspections or corrective actions. Furthermore, they will enhance staff training and conduct refresher training to reinforce adherence to proper e-waste handling, storage, and disposal protocols.

3.3. ROLE OF PROCUREMENT SPECIALISTS

The Procurement Specialist will ensure that all ICT equipment and related materials procured under the project comply with DEEP's e-waste management SOPs, including recyclability, energy efficiency, and Extended Producer Responsibility (EPR) obligations. They will integrate SOP-related clauses in bidding documents, contracts, and vendor agreements to enforce efficient and timely compliance. In coordination with Health/Gender/Safety Consultant in PMU and E&S Focal Persons in all PIUs and technical teams (Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from MOITT, NADRA, NITB and BOI respectively), they will track supplier adherence, maintain procurement and inventory records, and support monitoring of equipment lifecycle to ensure safe end-of-life disposal.

3.4. CERTIFIED OR EXPERIENCED MANAGER NETWORKS/HARDWARE ENGINEERS/DIRECTOR INFRASTRUCTURE/ ASSISTANT DIRECTOR IT FROM PMU AND PIUS

Hardware Engineers will play a central and important role in the safe dismantling, installation, maintenance, and end-of-life safe disposal of ICT equipment. They will ensure compliance with technical standards for safe handling, segregation of recyclable and non-recyclable components, and secure data sanitization before disposal. In coordination with health/gender/safety consultant in PMU and E&S focal persons in PIUs and procurement specialists, they will certify equipment conditions, oversee dismantling practices, and provide technical guidance for safe reuse, repair, or recycling of electronic equipment. They will also support documentation and reporting requirements to ensure effective traceability across the e-waste value chain.

Table 1: Key Activities and Responsibilities – E-Waste management SOPs and its implementation and Monitoring Plan

Activities	Detailed Responsibilities	Frequency	Output
Preparation of e-waste inventory (start of project)	Health/Gender/Safety (H/G/S) Consultant (PMU) designs methodology & template; Procurement Specialist (PMU) provides procurement records; E&S Focal Persons (PIUs) collect site-level data; PMU consolidates inputs from PIUs (from E&S Focal Person).	One-time	Initial E-Waste Inventory
Capacity building workshops & training	H/G/S Consultant (PMU) develops training modules & delivers initial sessions to E&S focal person, procurement specialists and; Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from PMU and PIUs; E&S Focal Persons (PIUs) conduct refresher training and awareness sessions to their respective Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from PMU and PIUs and Procurement Specialist.	Biannually	Training Reports & Attendance Records
Procurement of ICT equipment	Procurement Specialists (PMU & PIUs) ensure green procurement (energy efficiency, recyclability, lifecycle); H/G/S Consultant (PMU) verifies compliance; E&S Focal Persons (PIUs) monitor vendor commitments in their respective PIUs.	As per procurement plan	ICT Equipment Acquisition
Distribution & operations of ICT equipment	Procurement Specialists (PMU & PIUs) oversee allocation; Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from PMU and PIUs configure & install devices; H/G/S Consultant in PMU and E&S Focal Persons (PIUs) update asset registers; H/G/S Consultant (PMU) validates records.	As per procurement plan	Equipment Distribution Report
Collection of retired/obsolete ICT equipment	E&S Focal Persons (PIUs) identify and tag obsolete/retired devices; Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from PMU and PIUs verify condition; PIUs collect and secure equipment; PMU consolidates reports from PIUs.	Once a year (if e-waste generated)	Collected E-Waste Report
Recording & storage of obsolete ICT equipment	E&S Focal Persons (PIUs) maintain logs and storage; H/G/S Consultant (PMU) ensures consolidated records; Procurement Specialist verifies storage compliance; H/G/S Consultant checks OHS conditions.	Continuous	Updated Inventory & SOP Compliance Record
Initiation of e-waste disposal/recycling	E&S Focal Persons (PIUs) notify when disposal threshold is reached; Procurement Specialists (PMU & PIUs) prepare tenders/contracts; H/G/S Consultant (PMU) and E&S Focal Person in PIUs ensures environmental & OHS safeguards and integration of SOP's related clauses in tenders/contracts.	As required	Disposal/Recycling Requests & Documentation
Visit & selection of e-waste recyclers	PMU & PIUs jointly conduct site visits; Procurement Specialists verify licenses; H/G/S Consultant (PMU) checks compliance with PEPA/NEQS and DEEP's SOPs; E&S Focal Persons (PIUs) observe the compliance of this drafted SOPs.	Before each disposal cycle	Approved List of Authorized Recyclers
Implementation of e-waste disposal/recycling	Licensed recyclers execute disposal; H/G/S consultant in PMU and E&S Focal Persons (PIUs) oversee transfer & tagging; H/G/S Consultant (PMU) monitors SOP adherence; Procurement Specialists confirm documentation.	As required	Recycling/Disposal Certificates & Compliance Records
Updating e-waste inventory	H/G/S consultant in PMU and E&S Focal Persons (PIUs) update local records; PMU consolidates PIU data into a central database; Procurement Specialist cross-checks with disposal contracts; H/G/S Consultant ensures reporting compliance.	Throughout project life	Final Updated Inventory & Disposal Records

The H/G/S Consultant and procurement specialist provide guidelines, awareness and training to all project workers in the PMU, and in case of PIUs, E&S Focal Persons in PIUs in close coordination and collaboration with H/G/S Consultant (PMU), Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from PMU and PIUs respectively, and procurement specialist in their respective unit will provide training, awareness to all project staff on the following areas:

1. **Introduction to Electronic Devices:**
   - Provide an overview of the electronic devices being used, including their features, functionalities, and purpose within the project.
2. **Training on Electronic Devices E- Usage:**
   - Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/Assistant Director IT from PMU and PIUs of DEEP will conduct comprehensive training sessions to familiarize technical officers and responsible E&S Focal Persons with the operation and management of electronic devices.
   - Cover topics such as turning the device on/off, navigating the interface, using specific apps/software relevant to the project, and troubleshooting common issues user manual guides (which will be translated in local language) will be used as training material.IT department will ensure that officers understand the importance of using electronic devices efficiently to streamline project activities.
3. **Safe Handling Practices:**
   - Emphasize the significance of safe handling to prevent damage and minimize e-waste generation.
   - Instruct officers to handle electronic devices with care and avoid dropping, banging, or exposing them to extreme temperatures or moisture.
   - Encourage the use of protective cases or covers to shield tablets from physical damage.
4. **Battery Management:**
   - Educate officers on proper battery management practices to prolong battery life and reduce the need for frequent replacements.
   - Advise against overcharging or fully draining the battery regularly, as it can degrade battery health.
   - Encourage officers to charge electronic devices only with approved chargers and power sources.
5. **Data Security Measures:**
   - Stress the importance of safeguarding sensitive data stored on electronic devices to prevent data breaches or leaks.
   - Instruct officers to use strong passwords or biometric authentication methods to secure access to the device.
   - Train officers on data encryption techniques and the importance of regular backups to prevent data loss in case of device malfunction or theft.

6. **E-waste Management**
    - Raise awareness about the environmental impact of e-waste and the importance of responsible disposal.
    - Provide training on E-waste management SOPs for proper storage and disposal methods for electronic waste.
7. **Reporting Procedures for Damage or Malfunction**
    - Designate a point of contact or IT support personnel responsible for addressing issues related with tablet damage, malfunction, or loss.
    - The custodians of e-devices will be instructed to report any issues promptly to concerned project authorities to prevent further damage and ensure timely repairs or replacements.
8. **Regular Maintenance and Update**
    - Advise officers to perform regular maintenance tasks, such as cleaning the electronic devices' screen and ports, to prevent dust buildup and ensure optimal performance.
    - Remind officers to install software updates and security patches regularly to keep electronic devices' up-to-date and secure against potential vulnerabilities
9. **Monitoring and Compliance**
    - Implement mechanisms for monitoring compliance with SOPs and evaluating the effectiveness of training programs.
    - Conduct periodic audits or assessments to identify areas for improvement and address any deviations from established procedures.
10. **Documentation and Review**
    - Maintain detailed documentation of SOPs, training materials, and incident reports for future reference and review.
    - Periodically review and update SOPs as needed to reflect changes in technology, regulations, or project requirements.

By following these SOPs, all project workers can effectively utilize electronic devices while minimizing the risk of damage and ensuring responsible handling to avoid e-waste generation.

4. Monitoring & Evaluation and Continuous Improvement

Regular comprehensive reviews, annual internal audits/monitoring (template annexed – Annex F), and periodic updates of procurement policies and procedures in light of SOPs related to pre-procurement, post- procurement and SOPs related to all other stages of e-waste management (Section 3- SOPs for E-Waste Management and 5 subsections) will be carried out to incorporate best practices in e-waste management under the project. Bi-annual meetings (every six months after allocation of ICT equipment) will be conducted by the Health/Gender/Safety Consultant in the PMU, together with E&S Focal Persons in all PIUs, Certified or experienced Manager Networks/Hardware Engineers/Director Infrastructure/ Assistant Director IT from PMU and PIUs respectively and Procurement Specialists, to ensure compliance with the usage of ICT devices and adherence to e-waste management SOPs under the project. Corrective actions will be taken in cases of non-compliance, with a focus on

continuous improvement of practices at all level of project. Each E&S Focal Person at the PIU level will prepare an internal audit report (reviewing practices and procedures outlined in the SOPs) and submit a bi-annual progress report to the H/G/S Consultant at the PMU. The PMU will consolidate all reports from the PIUs along with its own review and submit a consolidated report to the World Bank. For continuous improvement, data on e-waste generation, disposal, and recycling activities will also form part of regular E&S reporting internally and externally.

ANNEX-1

TEMPLATES, CHECKLISTS, AND REPORTING FORMATS FOR E-WASTE SOPS

Objective and Scope of SOPs for E-Waste Management

The objective of the SOPs for the Digital Economy Enhancement Project (DEEP) is to confirm the safe & secure dismantling, handling, and eco-friendly discarding of electronic waste (e-waste) produced because of the project's activities. This plan will emphasis on managing e-waste in the whole life cycle of project. It will start with the procurement, installation, and finally decommissioning of equipment used in the development and processing of digital infrastructure, such as servers, networking devices/systems, and different other ICT equipment. The focus of this SOPs is revolving around the e-waste generated during project's activity, including the creation of the National Digital Exchange Layer (NDEL), National Digital Identity (NDI), National Citizen Service Portal (CSP), Pakistan Business Portal (PBP) for the provision of e-services. Moreover, the plan will assist as a guide for developing a comprehensive and integrated e-waste management policy/plan/framework for potential digital projects and plans.

- End-of-life electrical and electronic devices, when collected in enough volumes and managed through material recovery units, can yield essential and valued resources such as copper, gold, silver, steel tin, palladium, and other metals. Furthermore, components like, capacitors, circuit boards, component of lithium-ion batteries, glass material and engineered plastic compounds and various other recyclable components can be recovered, reused and recycled, provided they are cautiously segregated and handled.
- The SOPs are lined up with the World Bank's Environmental and Social Framework (ESF), GIIP, Basal Convention, EPR principles, PEPA, NEQs and hazardous waste management policy, which put emphasis on reducing waste generation during the project life by centering innovative, advance and efficient system, technologies and processing. The plan primarily concentrates on reuse as a key approach, which involves the collection and repair of electronic devices & equipment to increase its lifespan. While reuse is not a lasting option, it offers a transitional method that led toward the development of more efficient e-waste handling and disposal practices.

By focusing on these principles, the SOPs for DEEP will not only highlight the immediate e-waste management systems of the project but also contribute to the obvious goal of progressing sustainable digital transformation in Pakistan.

ANNEX -1A

Template: General Monitoring Plan for Standard Operating Procedures (SOPs) for E-Waste Management

Name of Project Component/ Sub-component: _____

Project's Responsible Entity: _____

Project Location- City/Municipality: _____

A. **Description of Project's Office (PMU & PIUS):**

_____

_____

_____

_____

_____

_____

_____

B. **Please Annex: the list of Information and Communication Technology (ICT) Devices and Equipment's (number, type and specifications) to be procured (will be integrated with the SOPs)**

C. **Storage at the project's site (PMU/ PIUs):**

The estimated time for e-waste to be temporarily collected before being auctioned, disposed of or transported off- on site or off-site respectively is _____ hours. This specific storage time makes sure that e-waste is handled quickly to reduce environmental and health risks.

Description	Annex Picture

D. **The amount of dismantled ICT equipment to be reused on-site (will be annexed with the SOPs using template provided in Annex 1D)**
E. **Briefly describe the additional facilities required for e-waste management onsite:**

□ E-Waste Carriage Container □ E-Waste Storage Container

□ Personal Protective Equipment (PPE)

Aspects/Phases/ Areas	Implementation Plan		Monitoring Plan[2]		
	Proposed SOPs and Mitigation Measures	**Responsibility**	**Monitoring Parameter(s)**	**Frequency**	**Responsibility**
Design and Procurement Phase					
Planning for Operational Phase: E-Waste Issue	• Technical specifications in bids/contracts to identify recyclable equipment or components/parts of equipment. • Contract agreement to contain a commitment from the bidder to comply with the environmental requirements. • Technical specifications and BoM in bids/contracts should provide details about how they should be safely disposed of at the end of life. • MOITT will ensure that an auction of ICT equipment also conforms to the environmental policies as regards management of e-waste e.g., certified e-waste recyclers with proper facilities are considered.	Procurement Specialist, Health/Gender/Safety Consultant in PMU and Environmental and Social Focal Persons (ESFPs) in PIUS / E-waste Specialist	Bids evaluation criteria	Once before every procurement advertisement	Monitoring & Evaluation Specialist Health/Gender/Safety Consultant in PMU and Environmental and Social Focal Persons (ESFPs) in PIUS / E-waste Specialist
Capacity Building	• A training plan has been developed. Environment and Social Specialist must develop training materials.	Health/Gender/Safety Consultant in PMU and Environmental and Social Focal Persons (ESFPs) in PIUS	Training program	Once before the issuance of first procurement advertisement	Health/Gender/ Safety Consultant and ESFPs

[2] **Reporting:** ESFP in PMU and PIUs will be responsible for implementation of SOPs for e-waste management at respective office. Health/Gender/Safety Consultant in PMU and E&SFP in PIUs will use Annexures-1(1A to 1G) for recording the progress of e-waste management. ESFP will use template at Annex-1F for monitoring and reporting the progress on SOPs. Annex 1F will be used on weekly basis during design, dismantling and operational phases when e-waste will be generated. ESFP in all PIUs will keep record of all templates developed and will share a consolidated monthly report on same template to Health/Gender/Safety Consultant in PMU.

Aspects/Phases/ Areas	Implementation Plan		Monitoring Plan[3]		
	Proposed SOPs and Mitigation Measures	**Responsibility**	**Monitoring parameter(s)**	**Frequency**	**Responsibility**
Dismantling Phase					
Occupational Health and Safety	• A supervisor should be present on site throughout the operations. • The supervisor should be technical person aware of IT systems. • Allow only authorized and relevant personnel to perform dismantling tasks where electricity and hazardous substances are involved. • All workers use PPEs such as gloves, masks and boots. • Inspect power lines for any breach and if found damaged, repair immediately. • Keep CO_2 fire extinguishers ready near working sites. • Disconnect networking cables. • Shut down the systems properly one by one. • Disconnect power cables. • Shut-off power lines installed from main sources. • Check the power sockets and paste stickers/signs on damaged sockets mentioning "out of order" status. • Before dismantling any electronic device, seal up any broken parts in separate containers so that hazardous chemicals don't leak. • Wear latex gloves and a mask if you handle something broken. • Dismantle the networking systems one by one. • Dismantle electronic equipment including computers, printers, etc. one by one. • Make inventories using the template provided as annex-1B. • Forward inventories/records regularly to concerned authorities to include in the e-waste database to support the development of pertinent regulations. • Identify temporary storage areas. • Transport to temporary storage areas immediately after dismantling. • Store within marked areas leaving enough space for movement.	Health/Gender/ Safety Consultant in PMU and Environmental and Social Focal Persons (ESFPs) in PIUS	Use of PPEs Availability of fire extinguishers	Weekly till completion of dismantling phase at respective site	E-Waste Specialist, Health/ Gender/ Safety Consultant in PMU and ESFPs in PIUs

Aspects/ Phases/Areas	Implementation Plan		Monitoring Plan[3]		
	Proposed SOPs and Mitigation Measures	**Responsibility**	**Monitoring parameter(s)**	**Frequency**	**Responsibility**
General Guidelines	• Identify usable equipment (computers, laptops, networking equipment). • Develop inventory using the template at Annex-1B. • Identify repairable equipment that can be repaired and used to extend its useful life thereby reducing the e-waste for final disposal. • Tag each equipment as usable, repairable and unusable with unique identifier code. This will help in inventorying equipment for audit purposes. • Back up all data on new memory devices. • Clear memory from old equipment with experts' support. • Confirm memory clearance and non-recoverable status of data on memory devices.	Admin Unit of Project, Health/Gender/Safety Consultant in PMU and Environmental and Social Focal Persons (ESFPs) in PIUS	Inventories	Monthly	E&S Focal Person /E-Waste Specialist, Health/Gender/ Safety Consultant in PMU and E&S Focal Person in PIUs
Usable Equipment	• Assess future usability of usable equipment. • Identify general users within the MOITT, NADRA, NITB, IGNITE and BOI offices. • Handover usable equipment to designated office/users. • Update inventories accordingly.	Admin Unit of Project, H/G/S Consultant in PMU and Environmental and Social Focal Persons (ESFPs) in PIUS	Inventory	Monthly	E-Waste Specialist, Health/Gender/ Safety Consultant) in PMU and E&S Focal Person in PIUs
Repairable Equipment	• Apply necessary repairs through replacement of components or repairing of parts such as circuit boards, connectors, etc. • Include the repaired equipment in usable equipment inventory and handover to users accordingly.	H/G/S Consultant. ESFP, Admin Staff and IT department	Inventory	Monthly	E-Waste Specialist, Health/Gender/ Safety Consultant) in PMU and E&S Focal Person in PIUs
E-Waste	• E-waste collected in storage areas will be handed over to recyclers through auction within 3 months. • Environmental Focal Person (ESFP) to orient scrap dealers for creating awareness on the need to safely dispose-off E-waste. • ESFP to develop inventory of E-waste and handover inventory to successful and licensed e-waste recycler/scrap dealer along with the scrap containing E-waste being handed over by the admin staff. • Handover E-waste to licensed e- waste dealer/recycler using template at Annex-1C, selected through official procedures. • The licensed e-waste dealer/recycler after receiving the waste must provide certificate mentioning "recycling will be done to manage the E-waste and that the leftover E-waste after manual removal of usable parts at his scrapyard will be recycled in environment friendly manner".	H/G/S Consultant. ESFP, Admin Staff and IT department	Inventory Certificates	Monthly/ quarterly	E&SFP/E-Waste Specialist, Environmental and Social Specialist/Focal Person in all PIUs Scrap dealer, Admin Staff and monitoring and evaluation specialists

Aspects/Phases/ Areas	Implementation Plan		Monitoring Plan[3]		
	Proposed SOPs and Mitigation Measures	Responsibility	Monitoring parameter(s)	Frequency	Responsibility
	• The licensed e-waste dealer/recycler will also affirm that E-waste will not be burnt or treated for acid leaching to recover metals. • Take signature of licensed e-waste dealer/recycler on this certificate attached as Annex-1C. • ESFP to obtain receipts of E-waste being handed over to dealer/recycler. • ESFP and Admin staff to update inventories accordingly. • Third party monitor to confirm safety disposal by dealer/recycler through monitoring.				
Awareness Creation	• Creating awareness among e-waste dealers/recyclers and their workers about hazards of e-waste as well as need for eco-friendly recycling to conserve natural resources and sustainable use of available resources.	H/G/S Consultant in PMU and ESFP in PIUs	Certification as per Annex 1C	Before handing over E-waste and quarterly	E-Waste Specialist, (H/G/S Consultant) in PMU and ESFP in PIUs, M&E Specialist
Operation Phase					
	• Follow SOPS and mitigation measures mentioned against E-waste under dismantling phase above (Section 2).	H/G/S Consultant in PMU and ESFP in PIUs, Admin Staff	As per measures above at relevant space	As stated above at relevant space	H/G/S Consultant in PMU and ESFP in PIUs /E-Waste Specialist in PMU and PIUs, M&E Specialists
Awareness	• Raising awareness among users about the prohibition against disposing of e-waste with general waste. Use posters at prominent places.	H/G/S Consultant in PMU and ESFP in PIUs, Admin Staff	Printing material displayed	Quarterly	H/G/S Consultant in PMU and ESFP in PIUs /E-Waste Specialist in PMU & PIUs, M&E Specialists

Cost Estimate for Implementation of E-Waste SOPs: _____

Signature of Project's Responsible Entity (Focal Person):_____

Dated: _____

ANNEX - 1B

Inventory for Electronic Devices in Project (PMU and PIUs)

Serial No.	Category of Devices	Manufacturers/ Brand Name	Model Number	Serial Number	Useful Life of Device	Software/ Operating System	Accessories	Purchase Date	Warranty Status	Asset Tag	Maintenance History	Disposition

ANNEX - 1C

Allocation of Electronic Device/Equipment to Project Staff (PMU and PIUs)

Serial No.	Name of Device/ Equipment	EMIE Number	PTI Approval	Software Update	Application Update	Name of Project Staff	Email Address	Contact Number

ANNEX-1D

Inventory of Dismantled ICT Equipment and E-Waste

Date: _____

Project's Responsible Entity: _____

Location: _____

Type and Quantity of ICT Equipment Dismantled

Sr. No.	Type	Quantity	Usable	E-Waste	Storage Status	Remarks (If any)
Total						

Inventory developed by _____ Administration Unit _____

Note: Below certification to be signed at the time of handing over of E-waste to dealer concerned. Certification copy to be submitted to DEEP PMU through ESFP.

Certified that above E-waste has been handed over to scrap dealer/recycler on _____ along with briefing on Environmentally Safe Disposal of E-waste by the dealer.

Admin Focal Person _____

ANNEX-1E

E-Waste (ICT equipment) Handed Over to Scrap Dealer/Recycler

Date:_____

Project's Responsible Entity: _____

Type and Quantity of E-waste/ICT Equipment

No.	Type	Quantity	Approx. Weight
1	Personal Computers (CPU)		
2	Laptop		
3	Flat screen monitor		
4	LED Monitor		
5	Printers		
6	Photocopiers		
7	Servers		
8	Keyboards and Mouse		
9	Ink toners		
10	Network Switches/routers		
11	Networking Cables, Electrical Wires		
12	Batteries		
13	**Others**		

The scrap/e-waste dealer hereby declares that recycling will be done to manage the E-waste at his facility and that the final remaining E-waste after manual removal of usable parts at his scrapyard will be disposed- off in environment friendly manner. The dealer further assures that burning or acid leaching will never be applied on e-waste being handed over to him.

Admin Focal Person: _____ Dealer _____

Name and CNIC: _____

ANNEX-1F

Template: SOPs Monitoring Checklist/Report for E-Waste Management

Project Component	**Infrastructure Project Financing Component –** Digital Economy Enhancement Project (DEEP)		
Project's Responsible Entity		Project Phase	**Design/Dismantling/etc.**
Report No.		Reporting Date	
Monitoring Date		**Project's Responsible Entity (Monitoring Officer)**	**(Name and Designation)**

Status of Compliance to SOPs for E-Waste Management

Impacts	**SOPs and Mitigation Measures**	**Status of Compliance**				**Remarks**
		Full	**Partial**	**No**	**NA**	
Compliance Status of SOPs for E-Waste Management – Procurement and Design Phase						
Planning for Operational Phase E-Waste Issues	Technical specifications in bids/contracts to identify recyclable or hazardous equipment or components/parts of equipment.					
	Contract agreement to contain a commitment from the bidder to comply with the Environmental requirements.					
	Technical specifications in bids/contracts should provide details about how they should be safely disposed of at the end of life.					
	PMU and PIUs will ensure that the auction of ICT equipment also conforms to the environmental policies as regards the SOPs of e-waste e.g., certified e-waste recyclers with proper facilities are considered.					
Capacity Building	A training plan will be developed. H/G/S consultant in PMU and ESFP in PIUs must develop training materials accordingly.					
Compliance Status of SOPs for E-Waste Management – Dismantling Phase						
Occupational Health and Safety	An admin supervisor should be present on site throughout the operations. Supervisor should be technical person aware of IT systems.					
	Allow only authorized and relevant personnel to perform dismantling tasks where electricity and hazardous substances are involved.					

Impacts	SOPs and Mitigation Measure	Status of Compliance				Remarks
		Full	Partial	No	NA	
Occupational Health and Safety	All workers use PPEs such as gloves, masks and boots.					
	Inspect power lines for any breach and if found damaged, repair immediately.					
	Keep CO_2 fire extinguishers ready near work sites.					
	Disconnect networking cables.					
	Shut down the systems properly one by one.					
	Disconnect power cables.					
	Shut-off power lines installed from main sources.					
	Check the power sockets and paste stickers/signs on damaged sockets mentioning "out of order" status.					
	Before dismantling any electronic device, seal up any broken parts in separate containers so that hazardous chemicals don't leak.					
	Wear latex gloves and a mask if you handle something broken. Dismantle the networking systems one by one.					
	Dismantle electronic equipment including computers, printers, etc. one by one.					
	Make inventories using the template provided as Annex-1B to Annex 1E.					
	Forward inventories/records regularly to concerned authorities to include in the e-waste database to support the development of pertinent Regulations.					
	Identify temporary storage areas.					

Impacts	SOPs and Mitigation Measure	Status of Compliance				Remarks
		Full	Partial	No	NA	
Occupational Health and Safety	Transport to temporary storage areas immediately after dismantling.					
	Store within marked areas leaving enough space for movement.					
	Identify usable equipment (computers, laptops, networking equipment). Develop inventory using the template at Annex 1B to Annex 1E.					
	Identify repairable equipment that can be repaired and used to extend its useful life thereby reducing the e-waste for final disposal.					
General Guidelines	Tag each equipment as usable, repairable and unusable with unique identifier code. This will help with inventory of equipment for audit purposes.					
	Back up all data on new memory devices.					
	Clear memory from old equipment with experts' support.					
	Confirm memory clearance and non-recoverable status of data on memory devices.					
	Assess the future usability of usable equipment.					
	Identify general users/ workers within the project offices in PMU and PIUs with all details of equipment and allocation duration.					
Usable Equipment	Handover usable equipment to designated office/users in PMU and PIUs					
	Update inventories accordingly.					
Repairable Equipment	Apply necessary repairs through replacement of components or repairing of parts such as circuit boards, connectors, etc.					
	Include the repaired equipment in usable equipment inventory and handover to users accordingly.					
	E-waste collected in storage areas will be handed over to recyclers through auction within 3 months.					

Impacts	SOPs and Mitigation Measure	Status of Compliance				Remarks
		Full	Partial	No	NA	
E-Waste	H/G/S Consultant and E&SFP to orient scrap dealers for creating awareness on the need to safely dispose- off E-wastes.					
	H/G/S Consultant and ESFP to develop inventory of E-waste and handover inventory to successful and licensed e-waste recycler/scrap dealer along with the scrap containing E-waste being handed over by the admin staff.					
	Handover E-waste to licensed e-waste dealer/recycler using template at Annex-1D and Annex 1E, selected through official procedures.					
	The licensed e-waste dealer/recycler after receiving the wastes must provide certificate mentioning "recycling will be done to manage the E-waste and that the leftover E-waste after manual removal of usable parts at his scrapyard will be recycled in environment friendly manner". The licensed e-waste dealer/recycler will also affirm that E-waste will not be burnt or treated for acid leaching to recover metals.					
	Take signature of licensed e- waste dealer/recycler on this certificate attached as Annex- 1D and Annex 1E.					
	H/G/S Consultant and ESFP to obtain receipts of E- waste being handed over to dealer/recycler.					
	H/G/S Consultant and ESFP and Admin staff to update inventories accordingly.					
	PMU and PIUs had engage third party monitor to confirm safe disposal by dealer/recycler through monitoring.					
Awareness Creation	Creating awareness among e- waste dealers/recyclers and their workers about hazards of e- waste as well as need for eco-friendly recycling to conserve natural resources and sustainable use of available Resources.					

Impacts	SOPs and Mitigation Measure	Status of Compliance				Remarks
		Full	Partial	No	NA	
Compliance Status of SOPs for E-Waste Management– Operation Phase						
E-Waste Management	Follow mitigation measures mentioned against E-waste under all phases of e-waste management					
Awareness	Raising awareness among users about the prohibition against disposing e-waste with general waste. Use posters at prominent places.					

Other Observations during Monitoring

Observations	Recommendations
1.	1.

PHOTOGRAPHS: MONITORING OF SOPS FOR E-WASTE MANAGEMENT

Must be in landscape
Requirement: Minimum
6 pictures.

ANNEX- 1G

Consultation with Stakeholders for the Development of E-Waste SOPs

Place and Type of Engagement	Date	Participants	Key Issues Discussed
Consultative Meetings and Discussion	27th February, 2025	Program Director, Director Technical and Innovation (MoITT), E&S team of World Bank	Environmental and Social Risk identification, Discussion on ESCP and related deliverables
Workshop: Stakeholder Engagement	25th February, 2025	Program Director, Director Technical and Innovation (MoITT), Project Directors of all PIUs, Procurement team of BOI, Communication and Coordination team of Project, HR and Admin Specialist of Project, teams of World Bank	Discussion on procurement plan, monitoring plan, Stakeholder Engagement Plan (SEP), Grievance Redress Mechanism and Implementation Status and result report. Further, identification of dedicated E&S Focal Person/Specialist in the Project who will work with Health/Gender/Safety Consultant in PMU to finalize and implement all E&S instruments of project, e.g., E-waste management SOPs, SEP and GRM etc.
Consultative Session with Pakistan Environmental Protection Agency	25th August 2025	Dr. Mohsina Zubair –PAK EPA Director, Health/Gender/Safety Consultant (DEEP)	Consultation on the compliance with national environmental regulations and good international practices, Inclusion of environmental, health & safety safeguards, safe collection, storage, and transport mechanisms, recycling, repair, and disposal best practices
Consultative session with Private Sector in IT and Telecom Industry	27th August 2025	Deputy Secretary Development (MoITT), Health/Gender/Safety Consultant (PMU), Private Sector Stakeholders (Telecommunication Companies, IT and Software Companies, Fintech and Digital Economy Players, Hardware Importers and Distributors, Electronic & Mobile Device Assemblers, Data Centers and Cloud Companies)	Discussion on sustainable options for recycling electronic equipment should focus on the concept of a circular economy. Public–Private Partnerships (PPPs) must be included across the entire e-waste management cycle. Government entities should publish data on certified vendors to ensure environmentally sustainable practices. For digital enhancement projects,

			specific SOPs can be developed in line with the legislative framework.
Training and Consultative sessions with all PIUS	1st September 2025	Program Director, Director Technical and Innovation (MoITT), Project Directors of all PIUs, Health/Gender/Safety Consultant (PMU), E&S Focal Person in all PIUs, Procurement team of PMU and PIUs, Technical Team of Project, Administrative team of Project,	Consultative session with project teams (PMU and PIUs) on the various stages of e-waste management, the roles of different specialists (M&E, technical staff, and Social & Environmental Focal Persons in all PIUs), and ways to make the SOPs more comprehensive, detailed, and focused to cover all domains of environmental sustainability in order to meet the World Bank's ESS requirements.

PHOTOGRAPHS: CONSULTATION OF STAKEHOLDERS FOR E-WASTE MANAGEMENT SOPS

1. **Consultation with Dr. Mohsina Zubair –Director EPA -25th August 2025 at PAK-EPA, H-8/2, Islamabad (2PM to 3PM)**

2. Consultative Session with PMU and PIU on the SOPs for E-Waste Management -1st September 2025 at National Incubation Center H-9/1, Islamabad (11:05 AM -12:30 Noon)

2a. Attendance Sheet of Consultative Session with project management and implementation entities on E-Waste Management SOPs-Monday, 1st September 2025 at National Incubation Center (NIC)-H-9/1, Islamabad-11:05 AM-12:30 Noon

GOVERNMENT OF PAKISTAN

MINISTRY OF INFORMATION TECHNOLOGY & TELECOMMUNICATION

DIGITAL NATION PAKISTAN

ATTENDANCE SHEET

Consultation Meeting on SOPs for E-Waste Management under the Digital Economy Enhancement Project, held on 1st September at 11:05 AM.

S.No.	Name	Designation/ Organization	Contact No.	Email Address	Signature
1.	Sheeraz M[illegible]	DEEP/ [illegible]	0345-5055560		[signature]
2.	Muhammad Salman	DEEP [illegible]	03329172188	-	[signature]
3.	Jawad [illegible]	DEEP/ Proc Spe	03330482002		[signature]
4.	NAGMA FARID	DEEP / NITB			[signature]
5.	M. [illegible]	NITB			[signature]
6.	Zaryab	NADRA			[signature]
7.	Sana Naseer	JDH/G/ [illegible]	-	-	[signature]
8.	Aqib Anwer	EMS	-		[signature]
9.	Syed Mustafa Ali	PMS-DBBD			[signature]
10.	Sami Khan	DD Infra			[signature]
11.	SANA NASIR	DIR OUTREACH + COMMS	0343-3247397	-	[signature]
12.	Shanza Shaukat	Interen	03705041256	-	[signature]
13.	FAISAL Mustafa	PD	03458797646		[signature]
14.	Naveel Irfan	NITB	0345600[illegible]		[signature]
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16.	MISBAH ZAFAR	PROJECT DIRECTOR DEEP (IF)	—	—	[signature]
17.	SHAHEEN UR Rehman	Agile Consult MoITT	0346-9786297	Agile.consult@ deep.moitt.[illegible]	[signature]
18.	Rizwan Khattak	NADRA-PIU DEEP	0335-5303053	procurement [illegible]	[signature]
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