Ministry of Education and Training Eswatini

THE WORLD BANK
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COMPONENT 2.2 PILOT
Secondary Schools ICT E-Waste Management Plan

STRENGTHENING BASIC EDUCATION SUPPORT

TO HUMAN CAPITAL DEVELOPMENT

IN ESWATINI Project Ministry of Education and Training

Contents

COMPONENT 2.2 PILOT SECONDARY SCHOOLS INFORMATION & COMMUNICATION TECHNOLOGY E-WASTE MANAGEMENT PLAN

1. INTRODUCTION

This plan outlines the framework for managing electronic waste (e-waste) generated from Information & Communication Technology (ICT) devices in 20 secondary schools and 2 tertiary education facilities under the **STRENGTHENING BASIC EDUCATION SUPPORT TO HUMAN CAPITAL DEVELOPMENT IN ESWATINI Project,** implemented by the Ministry of Education and Training. It aims to promote responsible disposal practices, protect the environment, and comply with relevant national and international regulations.

2. DEFINITION OF ELECTRONIC WASTE

E-waste definition and general considerations Waste Electric and Electronic Equipment (WEEE) is referred to as e-waste or electronic waste and it is defined as any end-of-life or endof-use piece of "equipment which is dependent on electrical currents or electromagnetic fields in order to work properly". It covers a broad range of electronic devices, ranging from large household appliances, information technology and telecommunications equipment, lighting equipment, monitoring and control instruments, electrical and electronic tools, and mobile phones to computers. Components of electric and electronic equipment (EEE), such as batteries, plastic casings, etc. Possible WEEE to be covered by this project will include computers, scanners, printers, servers, copiers, electric cables, cell phones/tablets. E-waste contains materials that, if mishandled, can be hazardous to human health and the environment, but, most importantly, also materials that are valuable and scarce.

3. ELECTRONIC WASTE MANAGEMENT PLAN

This Electrical Waste Management Plan (EWMP) will be implemented throughout the project's lifecycle and will follow and comply with the ESS1 and ESS3 of the Environmental and Social Framework of the World Bank. The plan is required to be adopted during the project implementation period when project financed electrical equipment (computers, printers, servers, cables, etc.), among others, are replaced, irreparable or at their end of life. This plan must also comply with existing Eswatini relevant legislation and regulations.

3.1 ENVIRONMENTAL AND SOCIAL STANDARDS (ESS)

The project will follow national legislation and World Bank guidelines for the management of E-waste. The project will avoid the disposal of E-waste by reuse, recycle, and recover. Where E-waste cannot be reused, recycled, or recovered, then the project will advise schools to treat, destroy, or dispose of E-waste in accordance with ESS 1 and ESS 3 through licensed third-party contractors and all E-waste will be disposed of in hazardous waste landfill or licensed disposal

facilities. Unfortunately, in Eswatini there is no facility/regulations specifically dealing e-waste management; thus, the project is still to explore partnerships with hazardous waste recyclers.

4. OBJECTIVES

- o **Reduce e-waste generation:** Implement measures to extend the lifespan of ICT devices and minimize the creation of e-waste.
- o **Proper e-waste collection and storage:** Establish systems for secure and environmentally sound collection and storage of e-waste.
- o **Safe and responsible disposal:** Ensure e-waste is disposed of in accordance with national and international standards, minimizing environmental and health risks. These standards/requirements are provided in the Waste Regulations of 2000 (which, however, is not specific to e-waste).
- o **Promote awareness and education:** Educate school staff, students, and communities about the importance of e-waste management and responsible ICT practices.

5. TARGET AUDIENCE

- o Beneficiary secondary school Principals
- o Tertiary Education Centres (UNESWA & William Pitcher College) o ICT teachers and technicians
- o Students o Parents
- o Community members (where applicable)

6. SCOPE

Strengthening Basic Education Support to Human Capital Development in Eswatini Project will manage environmental and social risks and impacts of the project throughout the project life cycle in a systematic manner, proportionate to the nature and scale of the project and to the potential risks and impacts. The generation of waste is one of those risks that must be considered during the planning and implementation phases of the project. Waste management planning for the project should be conducted early to identify sound management practices and procedures within legal and environmental frameworks. Possible waste streams that may be generated during project implementation may include papers and electronic wastes. However, the focus of this plan is on electronic waste or E-waste. An EWaste Management Plan (EWMP) is used to describe the waste management related issues within the Electrical and Electronic Equipment (EEE) industry sector and specify the best way to address these issues, giving specific actions, targets, and timeframes. This E-waste management plan should be implemented throughout the project's lifecycle to protect the environment, biodiversity, and habitats, safeguard the health of the local communities, and comply with the World Bank Environment, Safety and Health Guidelines (ESHG) Environmental and Social Standards (ESS), Eswatini legislations and regulations.

This plan covers the management of e-waste generated from ICT devices such as:

Table 1: ICT Devices supplied to schools

Item	Quantity
Desktop Computers	2 per school; (44)
Laptops	Depends on number of Math's teachers
Interactive Touch Screen	2 per school; (44)
Tablets	102 per school; (208)
Printers with scanners	2 per school; (44)

6.1 TOXICITY AND RADIOACTIVE NATURE OF E-WASTE TO HUMAN, WATER, SOIL, AND ANIMALS

Electrical and electronic equipment contain different hazardous materials, which are harmful to human health and the environment if not disposed of carefully. While some naturally occurring substances are harmless in nature, their use in the manufacture of electronic equipment often results in compounds, which are hazardous. However, quantifying this waste is not possible.

Table 2: Toxicity and radioactive nature of E-Waste to human, water, soil and animals.

Substance Occurrence in E-waste	Substance Occurrence in E-waste from schools and other educational facilities
Heavy metals and other metals	
Arsenic - Small quantities in the form of gallium arsenide	Arsenic Small quantities in the form of gallium arsenide
Beryllium - Power supply boxes which contain silicon-controlled	Beryllium Power supply boxes which contain silicon-controlled
Cadmium - Rechargeable computer batteries, fluorescent layer	Cadmium Rechargeable computer batteries, fluorescent layer
Lead - CRT screens, batteries, printed wiring boards,	Lead CRT screens, batteries, printed wiring boards,
Selenium - Older photocopying-machines (photo drums)	Selenium Older photocopying-machines (photo drums)

7. IMPLEMENTATION OF THE ELECTRONIC WASTE MANAGEMENT PLAN

7.1. Device Lifecycle Management

- o **Purchase & Procurement:** Prioritize energy-efficient and durable devices with longer lifespans. (This should be included in the bidding documents. If possible, have an

agreement/contract with supplier that he/she will be responsible for maintenance and e-waste collection).

- o **Inventory Tracking:** The school should maintain a comprehensive inventory of all ICT devices and waste to track their usage and potential obsolescence. (The ICT Technician/Teacher should be the focal point and responsible for this).
- o **Regular Maintenance & Repair:** Schools should implement proactive maintenance programmes to extend the lifespan of devices. Encourage repair services over immediate replacement.
- o **Software Updates & Upgrades:** The school should ensure that devices receive regular software updates to enhance security and performance.
- o **Data Erasure:** Before disposal, the school should make sure that all data is securely erased to protect sensitive information.

7.2. E-Waste Collection and Storage

- o **Designated E-Waste Collection Points:** Under the technical guidance/advice of the Eswatini Environment Authority and Project E & S team, the schools should designate specific locations within each school for the storage and collection of e-waste. These points should be clearly labelled and easily accessible.
- o **Proper Storage:** Collected e-waste should be stored in designated containers that are secure, protected from the elements, easily accessible and prevent leakage of hazardous materials.
- o **Regular Collection:** Even though the e-waste won't be regularly generated, it should be noted that e-waste should be collected from storage points on a regular basis (where applicable), preventing accumulation.

7.3. E-Waste Disposal

- o **Partner with Licensed E-Waste Recyclers:** Establish agreements with reputable ewaste recyclers certified to handle ICT devices responsibly.

  It should be noted that we do not have one in Eswatini, so the approach will be that local waste recyclers in the country partner with schools and establish international partnerships with South Africa for such purposes. Currently, hazardous waste such as electronic waste is transported to South Africa for disposal after getting a permit from the EEA.
- o **Safe and Environmentally Sound Disposal:** Ensure e-waste is transported and disposed of in compliance with national and international regulations, minimizing environmental harm.
- o **Documentation:** Maintain accurate records of all e-waste collected, stored, and disposed of, including quantities, dates, and recycler details.

7.4. Awareness and Education

- o **School Curriculum:** Integrate e-waste management education into the curriculum, particularly in ICT classes.
- o **Student Campaigns:** Encourage student-led initiatives to raise awareness about ewaste and responsible ICT use. This will also encourage establishment of Environmental Clubs in schools.
- o **Parent-Teacher Association (PTA) Engagement:** Collaborate with PTA to educate parents about e-waste management and its importance.
- o **Community Outreach:** Organize workshops/sensitization meetings and presentations for community members to promote awareness and sustainable practices.
- o **School and Community Posters:** Develop IEC material to sensitize and educate schools and communities on e-waste.

8. MONITORING & EVALUATION

The project will ensure continuous monitoring and evaluation of electronic waste management in the schools.

Table 3: Responsibility to perform monitoring and evaluation.

Activity	Responsibility
Conduct regular audits to assess the effectiveness of the e-waste management plan and identify areas for improvement.	E & S Team
Collect data on e-waste generated, collected, and disposed of, to monitor progress and identify trends.	Eswatini Environment Authority & E & S Team
Establish feedback mechanisms to receive input from school staff, students, and the community. This will be communicated through Project GRM.	E & S Team
Periodically review and update the plan based on feedback, data analysis, and evolving best practices.	E & S Team with relevant school

9. RESOURCES

- o **Eswatini Environment Authority (EEA):** The Project E & S Team will seek guidance on e-waste regulations and best practices from the EEA (based on their experience of international best practices).

- **International organizations:** During project implementation, the Project E & S Team will utilize resources from World Bank and other organizations such as the Basel Convention and the Global E-Waste Statistics Partnership (GESP) to support the implementation of the plan
- **Partnership with local recyclers:** The project will support schools to identify and establish partnerships with local e-waste recyclers in the country who will in turn be encouraged to partner with licensed e-waste recyclers in South Africa.

10. CONCLUSION

The Strengthening Basic Education Support to Human Capital Development Project in Eswatini by implementing this e-waste management plan will contribute to a more sustainable and responsible approach to ICT device management in the pilot secondary schools for Component 2.2. By promoting awareness, responsible practices, and safe disposal, it aims to minimize the environmental and health risks associated with e-waste, creating a cleaner and healthier environment for present and future generations.

Appendix 1: Pilot Schools

Item No	*School code*	*Name of High School*	*Location*
1.	1087	*Sidlangatsini High*	**Lubombo Region**
2.	960	*Ka-Langa High*	**Lubombo Region**

3	1084	Mafucula High	**Lubombo Region**
4	1069	Dvokodvweni High	**Lubombo Region**
5	1031	Malindza High	**Lubombo Region**
6	238	Madzanga High	**Hhohho Region**

7	19	Mdzimba High	**Hhohho Region**
8	4	Herefords High	**Hhohho Region**

9	289	*Masibekela High*	***Hhohho Region***
10	286	*Hawane High*	***Hhohho Region***
11	N/A	*UNESWA Kwaluseni*	***Manzini Region***
12		William Pitcher College	**Manzini Region**
13	0538	Sgombeni High School	**Manzini Region**

14	0503	Moyeni High School	**Manzini Region**

15	0515	Mkhondvo High School	**Manzini Region**
16	0571	Dvudvusini High School	**Manzini Region**
17	0405	Ngcoseni High School	**Manzini Region**
18	0664	Makhonza High School	**Shiselweni Region**
19	0830	Makhava High School	**Shiselweni Region**
20	0622	Nhletjenini High School	**Shiselweni Region**
21	0711	Dwaleni High School	**Shiselweni Region**

22	0602	Eric Rosenberg High School	**Shiselweni Region**

Appendix 2: SCREENING TOOL AND CHECKLIST FOR WASTE MANAGEMENT

Utilize along with the Waste Management Act of 2000 and World Bank Environment, Health and Safety Guidelines.

Question	Answer			Action
	Yes	No	Remarks	
Are different waste streams expected from sub-project implementation?				Review of waste sources during planning, siting, and design activities, and process alterations, to identify expected waste generation, pollution prevention opportunities, and necessary treatment, storage, and disposal infrastructure.
Are some waste streams recyclable				Evaluation of waste production processes and identification of potentially recyclable materials. Provide separate waste receptacles for recyclable waste. Identify waste recyclers.
Will hazardous waste be generated by the operation of the facilities, i.e., lab chemicals, e-waste.				Segregate hazardous waste from nonhazardous waste. Disposal of hazardous waste shall be done by licensed contractors.
Are there any recyclable waste streams				Separate waste storage from other hazardous waste streams. Identify relevant recyclers to collect and recycle.

| Are there any hazardous waste streams that will need disposal; | | | | Identify approved disposal facilities outside the country.

Engage EEA for Basel Convention process for effecting disposal. |
|---|---|---|---|---|

Appendix 3: Types of waste

Table 1 provides an overview of the potential wastes, their classification and avenues of disposal.

Waste Types	Waste Form	Waste stream	Disposal	Waste Handling
e-waste from computers, printers and laptops	S	Product-related stream	Recycling, re-use, or landfill	Contracted Approved disposal service
Old batteries from solar systems	L	Product -related stream	Recycling	Contracted Approved disposal service
Other solid waste from solar panels	S	Product -related stream	Recycling, re-use, or landfill	Contracted Approved disposal service
Solid waste like plastic, card board, and garbage	S	Material -related stream	Recycling, reuse, or landfill	Recycling depot
Other solid wastes	S	Material -related stream	Recycling, re-use, or landfill	Recycling depot
Liquid waste (sewerage from sanitary facilities)	P	Other	Recycling	Recycling depot

Electronic Waste Tracking and Management Template for Schools Purpose

This template is designed to help schools effectively track and manage electronic waste (ewaste) in a structured manner. Proper management of e-waste is vital for environmental sustainability and compliance with regulations.

1. Basic Information

School Name: ………………………………………………………..

School Address: ………………………………………………………..

Contact Person:

      Name & Title: ……………………………………………..

      School Address: ………………………………………….

      Phone………………………………………………..

2. E-Waste Inventory

Item ID	Item Type	Brand/Model	Serial Number	Nature of E-Waste	Storage Location	Condition	Date of Disposal	Responsible Party
1	Desktop Computer			Non-Functional / Obsolete	Storage Room A	Non-Functional		[Name/Department]
2	Laptop			Functional / Recyclable		Functional		
3	Printer			Non-Functional / Obsolete		Non-Functional		
4	Monitor			Non-Functional / Obsolete		Non-Functional		
5	Mobile Device			Functional / Recyclable		Functional		

2. Disposal and Recycling Information

Item ID	Preferred Disposal Method	Recycling Partner	Date Arranged	Status	Details/Notes
1	Recycling	[Partner Name]	[Date]	Scheduled / Completed	[Additional notes]
2	Donation				
3	E-Waste Collection				
4	Recycling				
5	Reuse				

3. Compliance and Regulations

Regulation/Guideline	Description	Status	Compliance Date	Notes
Local Disposal Regulations	[Brief Description]	ComplianT/ Non-Compliant		
World Bank E-Waste Guidelines	[Brief Description]			

4. Training and Awareness

Date	Training Session Title	Participants	Training Outcome	Next Steps

5. Continuous Improvement

Feedback Date	Feedback Provider	Feedback Summary	Action Taken	Follow-Up Date

Usage Instructions

- Fill out the template regularly to ensure accurate tracking of e-waste.

- Document every e-waste item as it is received, disposed of, or recycled.

- Ensure all stakeholders are informed about e-waste management practices and their roles.

- Conduct training sessions to enhance awareness and compliance with e-waste management.

Conclusion

This Electronic Waste Tracking and Management Template serves as a vital tool for schools to responsibly manage e-waste. By effectively documenting and monitoring e-waste, schools can contribute to environmental sustainability and prepare for future regulatory compliance. The Ministry of Education, through support from World Bank will continuously build capacity of schools to effectively manage e-waste.