Ministry of Education

E-WASTE MANAGEMENT GUIDELINES

Atolls Education Development Project

AEDP (P1777638)

May 2022

1. Table of Contents

Contents

Contents

2. List of Abbreviations

BESS	Battery Energy Storage Systems
CAM	Communications Authority of Maldives
C&D	Construction and Demolition Waste
CR	Civil Registration
CO2	Carbon Dioxide
EIA	Environmental Impact Assessment
EPA	Environment Protection Agency
EPPA	Environmental Protection and Preservation Act
EPR	Extended Producer Responsibility
GDS	Government Digital Service
IBM	Interactive Beneficiary Mechanism
IWMC	Island Waste Management Centers
ID	Identification
IXP	Internet Exchange Point
MoECCT	Ministry of Environment, Climate Change and Technology
MSW	Municipal Solid Waste
NCIT	National Center for Information Technology
RWMF	Regional Waste Management Facilities
RWMT	Regional Waste Management and Treatment
SOPs	Standard Operations Procedures
WEEE	Waste electronic, and electrical equipment
WtE	Waste to Energy

Detailed Project Description
MALDIVES: Atoll Education Development Project (AEDP)

Introduction

The Maldives Atoll Education Development Project (AEDP) is organized under five components: (a) enhancing curriculum delivery; (b) continuing teacher development; (c) measuring and enhancing system performance; (d) coordination, monitoring, capacity building and technical assistance; and (e) contingent emergency response. These components and the activities under them were prepared through a process of consultation and collaboration with the Ministry of Education (MoE); the Ministry of Finance and Treasury (MoFT); the atoll education agencies; public and private employers; academics and school principals, teachers, parents and students. The components and activities are also based on the knowledge and experience gained through the implementation of the Learning Assessment and Measurement (LAMP) Global Partnership for Education (GPE) trust fund.

Project Development Objective

The project development objective is to increase access to and enhance the quality of secondary education.

Project Description

Component One: Enhancing Curriculum Delivery and Increasing Higher Secondary Participation

The objective of this component is to promote strategic initiatives at the country level to strengthen and develop the general education system with a special focus on secondary grades. The activities under this component will be mainly implemented by schools with policy and technical support of the Ministry of Education (mainly PPR and School Administration Section), National Institute of Education (NIE), and the Department of Inclusive Education (DoIE). The following key sub-components will be supported under this component.

Sub-component 1.1: Improving learning in strategic subjects in secondary grades

The delivery of the secondary education curriculum will be enhanced to improve the quality of secondary education in subjects of strategic importance for economic development. First, there will be a focus on improving the English language skills of students. This will help open a variety of future job opportunities for students, including in the key tourism industry and related services. Second, mathematics and science learning will be strengthened in the school curriculum to promote science, technology, engineering and mathematics (STEM) education. Mathematics and science are increasingly important in the modern knowledge-based economy. Science will also increase environmental awareness among students by incorporating learning on mitigation (e.g. food waste, energy efficiency, and recycling). Improved English language, mathematics and science learning levels will better prepare secondary school completers for higher secondary education and tertiary education in the future. Third, the vocational education (VE) option will be strengthened in the school curriculum. This option will directly target the skills in demand in the local economy, defined as the atoll in which the school is located, as well as the national economy. Fourth, emphasis will be placed on developing green jobs skills that can advance sustainability transformations in key sectors, including tourism and allied services. The implementation of the Fehi

Madharusa (green school) initiative will help raise awareness to reduce adverse environmental footprints, promote eco-literacy, enhance climate literacy and support students' emergency preparedness and response measures. Improvements in the quality of education at the secondary education level will also enable more students to qualify for higher secondary education, enabling increased participation in higher secondary education.

The AEDP will increase the resources available for the teaching and learning of science, mathematics, English and vocational education (VE). The AEDP will support the development of science laboratories and vocational education workshops through the refurbishment of classrooms and the provision of equipment and technology in strategically selected secondary schools in the atolls. In addition, the Project will assist the expansion of ICT equipment and technology in atoll schools. The science laboratories, ICT facilities and vocational education workshops will incorporate green designs, such as rainwater harvesting systems and improved insulation that allows for energy efficiency and makes classrooms more resilient to rising temperatures. Schools will also be trained in measures to reduce e-waste. The refurbishment of facilities will take account of the learning needs of SEN students. The Project will also support digitization efforts, including online teaching systems for English language, mathematics, science and vocational education subjects to support blended learning and uninterrupted learning during natural disasters.

Improving English Language Learning Outcomes

English-language skills are widely acknowledged as vital for success in the modern global knowledge economy. The Project will prioritize support for the development of a strong and effective program to improve English language learning outcomes in the secondary stage of education of the school curriculum. This sub-component will be aligned with and complement the program for improvement of English language skills being implemented in the foundation and primary education stages (key stages one and two) through the Learning Assessment and Measurement Project (LAMP) financed by the Global Partnership for Education (GPE) trust fund. The focus will be on the vital language skills of vocabulary, reading, and writing. The Project support the following activities in homes and schools: (a) create an acquisition-rich English language learning environment for students to learn the language, where day-to-day conversation and extracurricular and cocurricular activities will be in English during at least a part of the school week; (b) encourage and affirm students who read books in the English language and engage with English language technology, as appropriate to their ages; (c) encourage families to create an environment at home which fosters English language learning, including English language reading materials and TV programs, and discussion and conversation in English at home; (d) promote cocurricular and extracurricular activities such as English literary, drama, and debating societies; (e) design other innovative activities to promote English language learning, with special attention to improving reading skills; and (f) support digitization efforts, including online teaching systems to facilitate English language learning. The pedagogical training needs of English teachers in a set of schools will be identified by the NIE, and training modules prepared and delivered to teachers in order to improve their pedagogical practices and assessment approaches. Assistance for English teachers for better curriculum implementation will be strengthened through an enhanced teacher development program, including SBPD.

Improving Mathematics Learning Outcomes

Mathematics is increasingly important in the modern knowledge-based economy and plays an important role in areas such as science and technology and is vital to research and development in fields such as engineering, computer science, medicine and science. It is an integral component of the science, technology, engineering and mathematics (STEM) discipline. Several activities will be supported to strengthen mathematics learning in the secondary school curriculum and promote STEM education. The mathematics teaching and learning environment in schools will be improved by the provision of mathematics educational material and technology. The use of technology will be promoted in appropriate and effective ways to support the curriculum. Innovative teaching learning approaches will be encouraged through the curriculum to stimulate children and promote their enjoyment of mathematics through planned active learning which provides opportunities to observe, explore, investigate, experiment, play, discuss and reflect and further to develop problem-solving capabilities and critical thinking skills. The pedagogical training needs of mathematics teachers in a set of schools will be identified by the NIE, and training modules prepared and delivered to teachers in order to improve their pedagogical practices, from how they plan to how they assess and how they teach mathematics. Attention will be paid to training teachers to diagnose student learning problems through formative assessments and classroom-based assessments and use the information gained to improve the teaching-learning process. Assistance for mathematics teachers for better curriculum implementation will be strengthened through an enhanced teacher development program, including SBPD. Online teaching systems to facilitate mathematics learning will be supported through digitization.

Improving Science Learning Outcomes

Science and its application are central to the economic future, health and wellbeing of individuals and society as a whole. Science is a vital subject in the science, technology, engineering and mathematics (STEM) discipline. STEM subjects permeate nearly every dimension of modern life and are key to solving many of society's most pressing challenges. The Project aims to improve science knowledge and promote STEM education in secondary grades by promoting teaching learning approaches that will help capture students' interest and provide them with the necessary skills and knowledge to raise science learning. The teaching and learning environment in schools will be improved through the provision of equipment and technology in strategically selected secondary schools in the atolls. The intervention will help students to focus on practical work which is a distinct feature of science education and essential for understanding how science works. Different teaching learning approaches will be encouraged through the curriculum by connecting children's learning to the real world. Teachers and students will be encouraged to make connections between the lesson and real-world experiences, current events, and/or students' lives. Further by linking with local industries, schools can show science and STEM in action. In addition, project-based learning approaches combining the individual disciplines within STEM will be promoted to create an exciting learning experience for children where they can work in teams to solve problems or tackle challenges. Technology will be used as a resource and a support system for the curriculum. The pedagogical training needs of science teachers in a set of schools will be identified by the NIE, and training modules prepared and delivered to teachers to improve their pedagogical practices and assessment approaches in a way that will align the curriculum, teaching and learning and

assessment. Assistance for science teachers for better curriculum implementation will be strengthened through an enhanced teacher development program, including SBPD.

STEM Education

The focus on science and mathematics, combined with ICT, will provide a foundation for STEM education. The school curriculum will also explicitly include topics such as coding and robotics which are important for the labor market and, in addition, will be useful for disciplines such as engineering and technology at higher levels of education. The AEDP will support the refurbishment of physical spaces and the provision of equipment and technology for STEM education, as well as continuing teacher development for STEM education.

Improving Skills Education

The school curriculum seeks to promote skills education through vocational education subjects introduced as an integral part of the education system. The AEDP will support the refurbishment of physical spaces and the provision of equipment and technology for skills education, as well as continuing teacher development for skills education.

Sub-component 1.2: Promoting participation in higher secondary education

The Maldives has an atoll-wide network of schools that provide universal access to primary (grades 1-7) and secondary (grades 8-10) education. However, until recently access to higher secondary education (grades 11-12) was very limited, initially to one school in Male', and then to four more schools in the atolls. The government has now expanded access to higher secondary education through 38 strategically selected schools across the country. These schools serve as hubs for higher secondary education in the atolls and in Male'. The higher secondary schools, and the secondary schools which feed students into them, need greater teaching-learning material and equipment, especially for IT and science, but also for English, mathematics and VE. Strong IT and English skills are necessary for all secondary school completers who either plan to seek employment opportunities in the labor market or proceed onwards to higher education. Better VE will also enable students to seek job opportunities in the labor market. A key activity to increase enrollment in higher secondary education, especially boys enrollment which currently lags well below girls enrollment, will include good career guidance for students and their families in secondary grades.

Component 2. Continuing Teacher Development

The component will assist GoM to carry out a program of continuing teacher development activities. The activities under this component will be mainly implemented by schools with the policy and technical support of the NIE.

Sub-component 2.1. Improving the delivery of teaching services

This sub- component will assist the National Institute of Education (NIE), with the support of the Teacher

Resource Centers (TRCs), to implement targeted teacher development programs (TDPs) for schools. The focus of these TDPs will be on improving subject content knowledge, pedagogical practices, career guidance skills, learning needs of SEN students, and climate change preparedness / emergency response of teachers. Through the outcomes defined in English, mathematics, and science subjects, teachers will be guided to use a skillful mix of learning and teaching approaches and instructional strategies, including activity-based learning and project-based learning, to stimulate children and promote an exciting and enjoyable learning experience. Teachers will also be guided in developing curricular materials and pedagogical practices for vocational education, including techniques such as hands-on problem solving, cooperative and team-based project learning, and activities that draw on knowledge and skills from various domains. An effective classroom assessment system to identify and assess the knowledge, understanding and skills students are developing in the classroom in each curriculum area will be incorporated, and teachers trained well for classroom assessment. Teachers will also be trained to provide career guidance to students. Special attention will be given to guiding students, and especially male students, to participate in appropriate higher secondary education subjects. The TDPs will be informed by the COACH1 principles to tailor the support to teachers to improve their teaching. Innovative approaches for the delivery of TDP, including blended approaches through online/ apps on smartphones will be supported under the Project. The Banks' Teach2 tool will be used as part of this evaluation to track and improve teaching quality.

Sub-component 2.2. School-based Professional Development (SBPD) of teachers.

The SBPD program will focus on: (a) raising the ability of school principals and senior management teams to establish a learning culture within the school with specific reference to English, mathematics, science and vocational education; (b) improve teacher motivation for their work; (c) enhance teacher performance by achieving required teacher competencies and improving their pedagogical practices; and (d) link teacher development activities to addressing student learning needs, including the needs of SEN students. SBPD is known from the international education literature to be the most effective mechanism for the continuous professional development of teachers. The NIE will measure (a) to (d) above through SBPD reports provided by the SBPD focal points in schools. The component will also support research to evaluate the SBPD practices in schools and their effectiveness in relation to improving student learning in science, mathematics, English, vocational education and green job skills in the atoll schools.

At each school, a Professional Development (PD) coordinator is identified by the principal and works as a focal point. The PD coordinator is expected to be competent and have the potential to coordinate and conduct the necessary training for the school staff. Teacher Resource Center (TRC) coordinators are expected to provide guidance and support to PD coordinators. In order to apply the SBPD activities and develop schools to become learning organizations, there is a need for on-going capacity building of the PD coordinators and TRC coordinators.

[1] https://www.worldbank.org/en/topic/teachers/brief/coach-helping-countries-accelerate-learning-by-improving-in-service-teacher-professional-development

[2] https://www.worldbank.org/en/topic/education/brief/teach-helping-countries-track-and-improve-teaching-quality

The AEDP will assist the MoE, especially the National Institute of Education (NIE), to further develop the system for SBPD by improving the capacity of PD coordinators and TRC coordinators, helping schools undertake SBPD activities, and assisting the NIE to monitor the implementation of SBPD in schools. All schools in Male' and the outer atolls will implement SBPD programs according to an annual cycle.

The range of SBPD activities will include school-based mentoring, peer learning, peer coaching, individual consultations, visits to classrooms in other schools and islands, and online interactions, including social media, apps, and cloud computing, for networking among teachers. Under SBPD:

- teachers can receive useful lessons on teaching techniques and observe demonstrations, including in differentiated learning for classes with children with varying learning needs;
- teachers can practice and discuss new techniques and new materials with colleagues and senior teachers on a regular basis;
- leading teachers can give classroom demonstrations using SBPD activities;
- the activities can increase communication and sharing of ideas among teachers;
- provide a positive focus for inspectors' school visits, classroom observation, and meetings with teachers;
- leading teachers can mentor and coach other teachers using SBPD activities frequently and regularly; and
- can serve as a link between a centralized type of in-service training program and specific teacher needs.

Component 3: Measuring and Enhancing School and System Performance

The component will assist GoM to measure the performance of the school system through quality assurance activities and national assessments of learning outcomes. The activities under this component will be mainly implemented by the QAD, and by schools with the policy and technical support of the QAD.

Sub-component 3.1. Modernizing Quality Assurance for School Improvement

Quality assurance (QA) is a key feature of education systems in many high-income countries, such as Scotland, Singapore, the United Kingdom (U.K), and the United Arab Emirates (UAE), and several Asian middle-income countries, including Malaysia and Sri Lanka. Quality assurance provides a framework for the systematic review and monitoring of an education system to determine whether an acceptable standard of quality is being achieved over the medium-term, and enhanced over the long-term in line with global developments in education.

The sub-component will help GoM to carry out a program of activities designed to support measurement of school performance through quality assurance (QA) reviews consisting of both self-evaluation by schools and external evaluations by the Quality Assurance Department (QAD). The AEDP will help the MoE to establish a regular, annual QA system for schools, with the main emphasis on internal self-evaluations. The school self-evaluations (SSEs) will, in turn, feed into the School Improvement Plans for the following year. QAD has prepared QA standards to facilitate the assessment of education inputs, processes and outcomes by schools (self-assessment) and by regional and national level authorities (monitoring and supervision). External evaluations of schools will be conducted by the QAD with special emphasis on the weaker schools.

The school self-evaluations will be conducted by stakeholders including principals, teachers, parents and local communities. This will enable extensive citizen engagement, including consultations, collection of stakeholder feedback, community participation in planning and decision making, and grievance redressal mechanisms. The QA process also provides opportunities for stakeholders, such as the principal, teachers, students, parents, and the local community to participate in planning and implementation of school development plans. The results of the quality assurance process will feed back into the school development plan, that would include the development of safe shelters in schools as part of the community disaster management plan, when necessary. The relevant information on the implementation of these plans will be shared with the stakeholders. This QA process constitutes the citizen engagement mechanism for the Project.

Sub-component 3.2. National Assessments of Learning Outcomes for Policy and Program Development

National assessments of learning outcomes have become one of the main vehicles for assessing education systems and formulating education policies in OECD countries and middle-income countries. National assessments are useful to analyze: (a) the quality of learning in the education system; (b) the particular strengths and weaknesses in the knowledge and skills of students; (c) the education performances of different atolls and islands; (d) educational and socio-economic factors associated with student learning outcomes; and (e) the evolution of learning achievements over time.

The AEDP will support the MoE to implement national assessments of learning outcomes in grades 4 and 7 according to a regular cycle for key subjects such as English, mathematics, Dhivehi and science, and also for grade 9 for English, mathematics and science, and use the results and findings for education program development. The AEDP will help build the technical capacity within the MoE, especially the QAD, to undertake rigorous, state-of-the-art national assessments. The Project will also build the capacity of policy makers and education specialists within the MoE, including NIE and the PPRD, to use the results and findings from national assessments for strategic policy and management decisions. The national assessments under the Project will help monitor learning outcomes over time. In addition, the Project will support the analysis of factors that contribute to learning outcomes, such as school-related factors, classroom-related factors, and child-related factors. International assessments are useful to analyze the quality of learning in the education system in relation to international levels. National and international assessments provide complementary information about the performance of education systems. The national assessments will be aligned to the UN's global proficiency framework3 and will include modules of test items drawn from international assessments such as PISA and/or TIMSS and/or PIRLS.

Component Four: Coordination, Monitoring, Capacity Building and Technical Assistance

Under this component the Project will help the MoE to coordinate and monitor the Projects' activities, as well as provide technical assistance and knowledge support to the MoE's agencies and to schools. Project coordination would be through a team of experts in operations, monitoring, procurement, financial management, and environment and social safeguards, who would assist the MoE, including atoll

[3] https://www.edu-links.org/resources/global-proficiency-framework-reading-and-mathematics

level officials such as the Teacher Resource Center (TRC) Coordinators, to implement and monitor project activities efficiently. The monitoring activities will take place at three levels: national, atoll and school. The purpose of monitoring will be formative, and support implementation at each level by identifying problems and taking action to resolve issues and remove bottlenecks to implementation. A Maldives education management information system (MEMIS) is in place and the statistics generated through it will be used for monitoring purposes. The resources from the Project will also support the communication and dissemination of information to education stakeholders, including political authorities, policy makers, academics and researchers, principals and teachers, students, and the general public.

Cross-cutting areas

The human resources in the education sector need to be developed urgently. The majority of education staff members in the MoE and the Atoll Education Offices have not had adequate management and leadership training. Therefore, considerable investment is required to develop the human resources of the education sector. The AEDP will assist the MoE to develop the human resources in the education sector, with a special focus on the staff of the MoE and associated institutes and departments. MoE staff, including from the Atoll Education Units, will be provided with short-term courses and/or programs tailor made to develop their administrative, managerial and technical skills for work in the MoE and Atolls. The types of courses in which short-term Human Resource Development activities would take place are summarized in Table 1.2. below.

Table 1.2: Indicative List of Short-Term Training Programs

Type of Short-Term Training Program	Staff from MoE Agencies to Participate
Education Planning and Program Development	MoE
National Assessment of Learning Outcomes	MoE, QAD
Quality Assurance	QAD
Models of Continuing Teacher Development	NIE, QAD
Statistics and statistical software	MoE, NIE, QAD
Computer applications (e.g. Microsoft office, accounts packages)	MoE
Procurement	MoE
Environmental management	MoE
Climate resilience through education	MoE, NIE

Note: this is an indicative list. New areas for short-term training can be included during project implementation. Funds for short-term training can come under the different components.

School-Based Learning Enhancement Grants

The Project will provide school-based learning enhancement grants (SBLEGs) to enable schools to implement activities to improve learning outcomes and socio-emotional skills of students and increase higher secondary enrolment. Special attention will be paid to improving learning in English, mathematics, science, STEM, and VE, and the green schools initiative, at secondary grades. Also, attention will be paid to measures to increase boys enrollment in higher secondary education.

Part of the SBLEGs can also be used for school level teacher development activities such as SBPD to improve teacher effectiveness, with a special focus on the teachers at secondary education level in the priority disciplines. A further part of the school grants can be used to enable schools to implement the recommendations of QA reviews to improve learning and increase higher secondary enrolment. Special attention will be paid to improving learning in English, mathematics, science and VE, and the green schools initiative, in secondary education. Also, attention will be paid to measures to increase boys enrollment in higher secondary education.

The School Administration (SA) section of the MoE will assist the OMSU to monitor the efficient utilization of the SBLEGs by including it in the annual performance review of the school principals.

Project Resources

Details of the project costs are shown in Table 1.2 below.

Table 1.2: Project Costs and Financing Summary (US$ million)

Project Components	Total	IDA	GoM
Component 1: Enhancing Curriculum Delivery	6.50	6.25	0.25
Component 2: Continuing Teacher Development	0.75	0.50	0.25
Component 3: Measuring and Enhancing School and System Performance	0.75	0.50	0.25
Component 4: Coordination, Monitoring, Capacity Building and Technical Assistance	1.00	0.75	0.25
School-Based Learning Enhancement Grants	1.00	1.00	0.00
Component 5: Contingency Emergency Response	0.0	0.0	0.0
Total	**10.00**	**9.00**	**1.00**

Note: The above numbers are indicative. There is flexibility to move funds across components, as needed to meet the overall objectives of the Project, during implementation.

What is E-Waste

E-waste is a term used to cover items of all types of waste electrical and electronic equipment (WEEE) and its parts that have been discarded by the owner as waste without the intention of re-use. Although e-waste is a general term, it is considered to cover any item with circuitry or electrical components with power or battery supply. E-waste contains toxic heavy metals and flame retardants such as mercury, lead, cadmium, polybrominated flame retardants and lithium and barium, that, if mishandled, can be hazardous to human health and the environment, but, most importantly, also materials that are valuable and scarce. E-waste volumes are growing exponentially because products are designed for linearity, and not circularity. The product either becomes obsolete due to planned obsolence or design features at the upstream stage, or because product life is not extended by repairing, or reuse. Moreover, in the absence of proper collection and recycling policies and

infrastructure-waste ends up in the environment. The proper treatment of e-waste avoids negative impacts and yields many benefits If not properly treated, e. waste can have negative impacts, both on human health and on the environment. When improperly disposed, e-waste can leach harmful into the soil and groundwater, that have deleterious effects on biodiversity, and it can also harm human health from direct contact or inhalation, such as neurological and endocronoligcal disorders , congenital mutations and respiratory impacts.

However, sustainable treatment of e-waste avoids these negative impacts. The appropriate handling of e-waste can both prevent serious health and environmental damage and also recover valuable materials, especially for common metals, rare earth and precious metals. The recycling chain for e-waste is classified into three main subsequent steps: i) collection, Ii) sorting/dismantling and pre-processing (including sorting, dismantling and mechanical treatment), and ili) end processing. All three steps should operate and interact in a holistic manner to achieve the overall recycling objectives. In addition, in order for this to be implemented successfully there needs to be actors and entities that are active in all three areas and steps. The main objectives of sustainable e-waste recycling are: i) Treat the hazardous fractions in an environmentally sound manner, ii) Maximize the recovery of valuable materials, III) Create eco-efficient and sustainable business, iv) Consider social impact and local context.

1. Estimated Nature of E-waste generation via project

Name of Equipment	Number to be procured	Typical Life Cycle	Component it is procured for
Computer System	945	10-20 Years	Component 1
Televisions	27	5-10 Years	Component 1
Projector	27	2-5 Years	Component 1
Laptops	27	5-10 Years	Component 1

3. Benefits of E- Waste Management in an Organized and Sustainable Manner.

Sustainable management practices, i.e., recycling operations also considerably contribute to reducing greenhouse gas emissions. Primary production of metals that are part of electrical and electronic equipment usually are large contributors to greenhouse gas emissions, i.e., mining, concentrating, smelting and refining, especially of precious and special metals has a significant carbon dioxide {CO2) impact due to the low concentration of these metals in the ores and often difficult mining conditions. But "mining" of old phones, servers or old computers to recover the contained metals - if done in an environmentally sound or correct manner - needs only a fraction of energy compared to mining ores in nature, i.e reduced emissions but also reduced impacts from land degradation, biodiversity loss and soil and water contamination. Recycling of E-Waste equipment reduces the amount of land that must be set aside specifically as landfill zones which in turn can be used for far more productive and socially beneficial usages such as low-income housing, more farming, or renewable energy power supplies. Recycling means that less money and energy must be expended for the mining of the

various minerals which are consumed during the manufacturing process to produce E-Waste equipment.

The environmental footprint of a phone, a computer and other electronic devices could be significantly reduced if its life cycle is prolonged by measures such as by repairing, either by maintenance or extended warranties, or if the product was built for circularity in the design phase. In addition, the impacts from the end-of life stage could be reduced by efficient collection and treatment of e-waste in environmentally sound managed recycling operations, which prevent hazardous emissions and ensure that a large part of the contained metals are recovered. This E-Waste Management plan does not include or mandates for the establishment of an E-Waste recycling infrastructure, but points in the direction that; building a sustainable recycling infrastructure creates jobs and contributes to capability building. The sustainable collection, sorting, manual dismantling and pre-processing of e-waste could create a significant number of jobs in the countries that would develop this activity.

4. Final Disposal Options for Hazardous Waste in Maldives

In general, Maldives has limited options for managing hazardous waste. Although most of the Island Waste Management Centers (IWMC) have designated specific areas for intermediary storage of hazardous waste (ventilated enclosed areas with sealed floors and roofs), there is no formal mechanism or infrastructure for the separate collection and recycling of e-waste in the country. The most prominent type of Hazardous Waste identified in the Maldives are expected to be engine oil, solvents, paint, boat coatings and worn-out lead batters. Currently, e-waste such as computers, printers, and cellphones can be collected by waste collectors along with household waste because there are no legal provisions or regulations enforcing the separate collection, treatment and recycling.

The two major Regional Waste Management Facilities (RWMFs) operated at present are Vandhoo RWMF located in Raa Atoll and Thilafushi RWMF in Male' Atoll. Vandhoo is used as a final disposal destination for municipal solid waste (MSW) generated in Zone 2, a catchment of 45 islands clustered into 4 atolls (Noonu, Raa, Baa and Lhaviyani atoll). This facility has a 35 ton per day capacity incinerator that was recently upgraded into a Waste to Energy (WtE) plant, a baling facility, an ash disposal landfill, a leachate collection pond, powerhouse, RO plant and waste processing and storage sheds. The plant is not yet brought back to operating conditions after its conversion to WtE, owing to an issue with a faulty part, which is expected to be resolved soon. Despite the foregoing limitation, the facility has been operational since mid-2019 with MSW being regularly collected from the IWMCs within the catchment and intermediary storage and baling at the facility continuing. It is important to note that, Vandhoo is not designed to cater for hazardous waste, however, some provisions have been made such as the inclusion of an 8000-liter used oil collecting tank. Further expansion works are planned with funding secured for creating additional storage spaces, rehabilitation of leachate collection ponds and the ash landfill, while discussions are ongoing with various funding agencies to expand its capacity even further to include provisions for recycling and chemical waste management.

Thilafushi has been used to cater for the waste management needs of Male' region ever since 1992. It was originally a lagoon (6km away from the capital ciil:y of Male') which was used to dump waste and as a result has turned into an island with a land area of 10 hectares, which is being used for waste management and industrial purposes. Until very recently, unconventional practices involving open burning and open landfilling techniques were employed in Thilafushi to manage waste. However, the MoECCT to completely cease open burning of waste in the year 2020. To facilitate this a large compactor has been brought to the facility to enable large scale compressing of waste, which could be then stored for longer periods, and 4 incinerators with a processing capacity of 300-800 kg of waste per hour has been acquired, installed and operated. Additionally, works are on-going to convert Thilafushi into a full-fledged RWMF capable of processing, treating and disposing residual MSW and Construction and Demolition (C&D) waste coming from Zone 3, which is comprised of 32 islands grouped into 4 atolls namely Kaafu (Male' atoll), Alif Alif, Alif Dhaalu and Vaavu atolls. The main components of this project are installation of two 250 ton per day capacity WtE plant and a baling facility with ancillary facilities, such as ash disposal landfills, intermediary storage spaces, bottom ash processing facility {brick making and road development) and C&D waste processing plant. A complete solution for hazardous waste is not offered through the regional facility initially, however, storage of hazardous waste will be facilitated. It is anticipated that the initially periodically the hazardous waste will be transferred from this storage facility to a hazardous waste management facility abroad.

Taking the forgoing into account, it is evident that neither Vandhoo nor Thilafushi is fully geared to offer a complete solution for hazardous waste such as E-waste and further developments need to come into the loop to facilitate a complete solution to deal with the concerned stream of waste, which is not available in country.

Private entities do work on E-waste recycling and buy back arrangements have been conducted with vendors that export usually Metals. However, there are no such formal or informal arrangements for E-Waste at present, however in some waste centers, used electronics are collected by individuals for reuse and repair.

5. Laws and Regulations Pertaining to E-Waste Management in the Maldives

Laws and Regulations

Environment Protection and Preservation Act (EPPA) (4/93)

This is the primary umbrella law for environmental protection in the Maldives. It was enacted in April 1993 o protect and preserve the environment of the country. The EPPA has specific clauses on waste disposal that are of relevance to the Maldives Digital Development Project. They are as follows:

Waste Disposal, Oil and Poisonous Substances: Any type of waste, oil, poisonous gases or any substance that may have harmful effect on the environment shall not be disposed within the territory of the Maldives. In case where the disposal of the substance stated in paragraph (a) of this clause becomes necessary, they shall be disposed only within the areas designated for the purpose by the government. If such waste is to be incinerated, appropriate precautions shall be taken to avoid any harm to the health of the population.

Hazardous/ Toxic or Nuclear Wastes: Hazardous/Toxic or Nuclear Wastes that is harmful to human health and the environment shall not be disposed anywhere within the territory of the country. Permission shall be obtained from the relevant government authority at least 3 months in advance for any trans-boundary movement of such wastes through the territory of the Maldives.

The presence of elements lead, mercury, arsenic, cadmium, selenium and hexavalent chromium and flame retardants in Waste electronic, and electrical equipment (WEEE) classifies it as a hazardous waste.

1.1.1 **Environmental Impact Assessment Regulation (NO. 2012/R-27) and Amendments**

Article 5 of the EPPA (above) stipulates that any development work or project that have a significant impact on the environment should have an Environmental Impact Assessment consented to by the Ministry of Environment Climate Change and Technology (MECCT).

The Environmental Impact Assessment (EIA) regulation defines the procedure to follow when attaining environmental approval for development projects. The regulations lists those projects that require EIA (schedule D), those projects that do not require EIA (Schedule T) and those projects that can be undertaken as per the mitigation plan provided by EPA (Schedule U). These schedules are not relevant for this project.

1.1.2 **Waste Management Bill**

The draft of the Waste Management Bill has been published by MoECCT on 27th January 2022 , and open for public comments. The Bill has specific chapters on waste management responsbilities, such as in collection, waste transfer, and disposal. Chapter 11 of the Act has clauses on Hazardous and Toxic Waste, which WEEE can fall under, but the Government's list does not include WEEE under the listed category.

1.1.3 **Waste Management Regulation NO. 2013/R-58)**

The Waste Management Regulation of the Maldives was enacted based on Article 22 of the Constitution of the Republic of Maldives, and under powers vested in the Ministry of Environment and Energy (now MECCT) under the Article 3 of the Environmental Preservation Act 4/93 in relation to Article 7 and 8 of the same Act. The regulation is implemented by the Environmental Protection Agency. This regulation focus on following five areas: 1. Waste management standards: Defines standards for waste collection, transfer, treatment, storage, waste site management, landfills and managing hazardous waste; 2. Waste management Permits: Defines approval procedures for waste sites; 3. Waster transfer: Standards and permits required for waste transport on land and sea, including transboundary movements; 4. Reporting requirements: Defines reporting and monitoring requirements and procedures; and 5. Enforcement: Defines procedures to implement WRM and penalties for non-compliance.

While there is no specific regulation for WEEE, the 5th Amendement to the Waste Regulation stipulates the segregation of bulky wastes, which includes TV's, refrigerators, washing, and other household appliances. While this segregation also applies to non-electric and non-electronic waste such as furniture, it is a first step which would allow for the efficient collection and consequent recycling of WEEE. The ideal next should would be to classfiy all WEEE, including other items as

washing machines, computers, phones, and have it completely spearated from other non-electric bulky wastes as well. Moreover, current responsiblities on collection and recycling are not largely designated for local governments and government subsideized waste collectors, and diversifying and allocating WEEE collection and recycling responsbilities to the private sector, under an Extended Producer Responsibility (EPR) framework would make the recycling more efficient, and also lead to the creation of jobs.

1.1.4 Strategic Action Plan (SAP)

The current governments policy on all development aspects are defined in Strategic Action Plan (SAP), where the government outlines the developmental targets and prioroties of the government from 2019-2023.

The SAP has specific policies, strategies and actions that can be applied for WEEE management.

In Chapter 8 Waste Management section of the SAP, the following policies may apply as guidance to the managemnet of WEEE in this project.

Policy 1: Promote waste as a valuable resource for income generation, where specifically Action 1.1e: calls for the development of regulations and guidelines for use, handling, and disposal of all types of chemical and hazardous waste

Policy 2: Improve chemical and hazardous waste management practices to ensure protection of people and the environment

Action 2.1a: Formulate and implement guidelines for the handling, storage and transport of non-medical hazardous waste and chemicals generated in the inhabited islands until they reach Regional Waste Management and Treatment (RWMT) Facilities

Action 2.1c: Formulate and implement guidelines for the appropriate disposal of electronic waste including waste generated from the energy sector

In addition, in Chapter 4 Jazeera Dhiriulhun, Target 5.2 states that by 2022 provisions for green procurement in the Public Finance Act should be implemented, which would also subject the procurements under this Project according to the relevant government regulations.

1.2 Institutional Arrangements for E-Waste Management in the Maldives

Currently there is no specific entity designated for E-waste management in the Maldives while regulation is handled by the Waste Management Department and the Maldives EPA. These two agencies as per the regulations and legal provisions presented above have the ability

1.3 World Bank ESF

Based in the ESS1, that establish responsibilities in relation with the risk and impact levels during the different project phases, the generation of all types of waste must be considered from the very beginning; during the predesign contracting, construction and operational phases. In all cases, provisions shall be taken, in order to minimize waste production and to reduce the impacts that the waste could create, specific (solid, liquid, toxic, sewers, etc.), and Electrical and Telecommunication

(E-Waste) management plans would be adopted during projects implementations to avoid affectation to stakeholders and livelihood, biodiversity and habitats nearby and surroundings of the project site and activities.

As the project is a digital development project, the project involves provision of significant IT infrastructure either as replacements or new purchase of equipment to support the project interventions. As the Maldives does not have explicitly existing standards or requirements for management (including storage, transportation, and disposal) of hazardous waste, which include E-Waste, GIIP such as the World Bank Groups Sectoral Guidelines on Solid Waste Management, and strict criteria on producer management of e-waste, including the transport of decommissioned systems out of the country as part of the investments, will be followed either via an agreement of NCIT with a certified e-waste recycling facility prior to project closure or by mandatory provisions in contracts with suppliers and contractors. These will be in line with both national legislation and applicable international conventions, including measures such as a buy-back arrangement with the equipment suppliers during the life cycle of the use. During project preparation, relevant domestic regulations, conventions and their enforcement will be reviewed against the requirements of ESS3 and the World Bank's applicable Environmental, Health, and Safety Guidelines to confirm the adequacy of the existing system for battery management and recycling in the Maldives. These documents will be used to develop a project-specific E-waste management guideline. The guideline will refer to measures that can be taken which can include buy-back arrangements of e-waste by vendors, recycling and resource recovery measures, and others.

2. Summary of Associated Environmental and Human Health Risks Associated with E-Waste

Summary of Associated Environmental and Human Health Risks Associated with E-Waste

The consequences of improper e-waste disposal in landfills or other non-dumping sites pose serious threats to current public health and can pollute ecosystems for generations to come. When electronics are improperly disposed and end up in landfills, toxic chemicals are released, impacting the earth's air, soil, water and ultimately, human health.

1.4 The Negative Effects on Air

Contamination in the air occurs when e-waste is informally disposed by dismantling, shredding or melting the materials, releasing dust particles or toxins, such as dioxins, into the environment that cause air pollution and damage respiratory health. E-waste of little value is often burned but burning also serves a way to get valuable metal from electronics, like copper. Chronic diseases and cancers are at a higher risk to occur when burning e-waste because it also releases fine particles, which can travel thousands of miles, creating numerous negative health risks to humans and animals. Higher value materials, such as gold and silver, are often removed from highly integrated electronics by using acids, desoldering, and other chemicals, which also release fumes in areas where recycling is not regulated properly. The negative effects on air from informal e-waste recycling are most dangerous for those who handle this waste, but the pollution can extend thousands of miles away from recycling sites

The air pollution caused by e-waste impacts some animal species more than others, which may be endangering these species and the biodiversity of certain regions that are chronically polluted. Over time, air pollution can hurt water quality, soil and plant species, creating irreversible damage in ecosystems.

1.5 The Negative Effects on Soil

When improper disposal of e-waste in regular landfills or in places where it is dumped illegally, both heavy metals and flame retardants can seep directly from the e-waste into the soil, causing contamination of underlying groundwater or in the case of the Maldives coastal areas and wetlands.

When large particles are released from burning, shredding or dismantling e-waste, they quickly re-deposit to the ground and contaminate the soil as well, due to their size and weight. The amount of soil contaminated depends on a range of factors including temperature, soil type, pH levels and soil composition. These pollutants can remain in the soil for a long period of time and can be harmful to microorganisms in the soil and plants. Ultimately, animals and wildlife relying on nature for survival will end up consuming affected plants, causing internal health problems.

1.6 The Negative Effects on Water

After soil contamination, heavy metals from e-waste, such as mercury, lithium, lead and barium, tend to leach through the earth even further to reach groundwater. When these heavy metals reach groundwater, they eventually make their way into ponds, streams, rivers and lakes or coastal systems and the ocean. Through these pathways, acidification and toxification are created in the water, which is unsafe for animals, plants and communities even if they are miles away from a recycling site. Clean drinking water becomes problematic to find.

Acidification can kill marine and freshwater organisms, disturb biodiversity and harm ecosystems. If acidification is present in water supplies, it can damage ecosystems to the point where recovery is questionable, if not impossible.

1.7 The Negative Effects on Humans

As mentioned, electronic waste contains toxic components that are dangerous to human health, such as mercury, lead, cadmium, polybrominated flame retardants, barium and lithium. The negative health effects of these toxins on humans include brain, heart, liver, kidney and skeletal system damage. It can also considerably affect the nervous and reproductive systems of the human body, leading to disease and birth defects. Improper disposal of e-waste is unbelievably dangerous to the global environment, which is why it is so important to spread awareness on this growing problem and the threatening aftermath.

2 E-waste Management Criteria and Protocols.

2.1 Objectives of the Guideline

The key objective of this guideline is the achievement and subsequent maintenance of a sustainable and integrated E-Waste management, that is effective and efficient use and management of Electronic equipment procured via the project and minimizing associated risks. The guideline has been developed with the broader context of the MoECCT/NCIT in mind to allow easy replicability and

use of department in the Ministry beyond the units that will benefit from electronic equipment that has been procured by the project

- Integrated E-waste management: its purpose is to reduce E-waste generation, and promote the reuse, recycling and initiatives to extract values from electronic equipment procured via the project.
- Effective E-Waste Management: The delivery of waste management services that provide for reliable collection and management of E-wastes consistent with sound environmental principles and standards once the useful life cycle of project financed equipment comes to be.
- Efficient waste management: the delivery of effective waste managing services in ways to minimax cost with results and promote better management of resources within the MoECCT/NCIT and other implementing agencies.

The following guidance steps will be followed on the management of non-hazardous e-waste that is deemed as General E-Waste. Additional guidance specifically applicable to hazardous e-wastes is presented below. E-waste management should be addressed through an e-waste management system that addresses issues linked to e-waste minimization, generation, transport, disposal, and monitoring. These guidelines via screening will characterize their e-waste according to composition, source, types of e-wastes produced, generation rates, or according to local regulatory requirements.

2.2 Conducting Diagnostics for Feasibility and Need for Management Steps

A diagnostic analysis must be performed in order to determine the level of involvement and processes needed to implement the steps in the guidelines and to what extent on a case-by-case basis in line with project procurements, nature of e-waste procured and amounts. For instance, if the E-wastes identified are very small, maybe the only option is to accumulate it until there is a volume enough to procure processing e-waste equipment. If the amounts are large, then it will be feasible to process and proceed with the later phases of the business of recycling. In all cases this analysis will include a screening assessment to understand the potential negative impacts associated with the guidelines and their implementation, in this process the following must be evaluated:

1. Characterize their e-waste according to composition, source, types of e-wastes produced, generation rates, or according to local regulatory requirements.
2. Possible environmental and social risks of use and disposal of the equipment
3. An Evaluation of the environmental and social impacts
4. Measurements for E-waste management at the end-of-life cycle: Actions for E-waste management as per the guide, i.e.- need for storage, transport, buy back or final disposal etc which include the following as applicable.
   a. Definition of opportunities for source reduction, as well as reuse and recycling
   b. Definition of procedures and operational controls for onsite storage
   c. Definition of options / procedures / operational controls for treatment and final disposal.
5. Implementation timetable or chronogram of actions.

The information above will be presented in the form of a Management Plan that will cover the 5 key areas identified, presenting all requisite information.

2.2.1 Additional Steps for Hazardous E- Waste Management

Hazardous e-wastes should always be segregated from non-hazardous e-wastes. If generation of hazardous e-waste cannot be prevented through the implementation of the guidance steps and management practices, its management should focus on the prevention of harm to health, safety, and the environment via the screening process defined in section 6.2, according to the following additional principles presented below.

1. Understand potential impacts and risks associated with the management of any generated hazardous e-waste during its complete life cycle.
2. Ensure that contractors handling, treating, and disposing of hazardous e-waste are reputable and legitimate enterprises, licensed by the relevant regulatory agencies and following good international industry practice for the e-waste being handled.
3. Ensure compliance with applicable local and international regulations.

Hazardous e-waste materials are frequently generated in small quantities by many projects through a variety of activities such as equipment breakages or end of life cycle use. Examples of these types of e-wastes include used laptop batteries (such as nickel-cadmium or lead acid), servers, computers, cables, etc. These e-wastes should be managed following the guidance provided above at screening diagnostic activity.

2.3 Use to Ensure Life Cycle Use at User Level

The user use cycle should be operated to prevent, or minimize, the quantities of e-wastes generated, and hazards associated with the e-wastes generated in accordance with the following strategy:

- Selection of Electronic equipment that have longer use time frames, warranties and can easily be repaired and reused- as well as equipments for those there are take-back agreement -The technical and procurement team should make sure the options are well evaluated in line with the E-waste guide.
- Selection of electronic equipment with modular designs, or designs that facilitate ease of repairability (?)
- Instituting good housekeeping and operating practices, including inventory control to reduce the amount of e-waste resulting from materials that are out-of-date, off specification, contaminated, damaged, or excess to operational needs.
- Minimizing hazardous e-waste generation by implementing stringent e-waste segregation to prevent the commingling of non-hazardous and hazardous e-waste to be managed.
- Conducting awareness and information sharing with users should be done to ensure that they follow user manuals and are responsible for device use as per guidance provided by manufacturers.

2.4 Collection and Storage of E-Waste

Hazardous e-waste should be stored so as to prevent or control accidental releases to air, soil, and water resources as per the following guidance within the MoECCT/NCIT premises where they will be used:

a. E-waste must store in a manner that prevents the commingling or contact between incompatible e-wastes and allows for inspection between containers to monitor leaks or spills.

Examples include sufficient space between incompatibles or physical separation such as walls or containment curbs

b. All e-waste must be stored in closed containers (some could be radioactive proof), away from direct sunlight, wind and rain.

c. Secondary containment systems should be constructed with materials appropriate for the e-wastes being contained and adequate to prevent loss to the environment.

d. Provision of readily available information on compatibility to employees, including labelling each container to identify its contents should be provided.

e. Limiting access to hazardous e-waste storage areas to employees who have received proper training

f. Clearly identifying (label) and demarcating the area, including documentation of its location on a facility map or site plan vii) Conducting periodic inspections of e-waste storage areas and documenting the findings.

g. The collection and handling should be carried out by the staff designated within the MoECCT/NCIT for management of IT equipment and the protocols should be clearly communicated to all staff in the form of posters and email.

3.2 Reuse, Repair and Recycle?

In addition to the implementation of e-waste prevention strategies, the total amount of e-waste may be significantly reduced through the implementation of recycling plans, which should consider the following elements and the MoECCT/NCIT during the use will use the following protocols as well as communicate the same for users when handing over with use agreements:

- Identification and recycling of products that can be reintroduced into the operational processes
- Investigation of external markets for recycling by other industrial processing operations located in the neighborhood or region of the facility (e.g., e-waste exchange)
- Establishing recycling objectives and formal tracking of e-waste generation and recycling rates
- Providing training and incentives to employees in order to meet objectives of use as per the handling and care instructions of the equipment.

2.5 Recycling E-waste/Buy Back Arrangements

As mentioned previously two options are considered. Buy-back by the supplier, this can be achieved by incorporating provisions for buyback to the supply contracts for all IT equipment. The Second option is for MoECTT/NCIT to have a separate agreement with certified e-waste recycling facility. The advantage of the latter option is this will not only limit recycling to equipment procured under the project as it will expand beyond the project and all e-waste generated by NCIT could be recycled. Moreover, supply contracts having buy-back arrangements can lead to price hikes of equipment procured. In addition, there is risk of supplier becoming inactive prior to lifetime of equipment is up. Due to this reason for the project at hand the latter option will be followed during the equipment procurement process for certain equipment that will be defined at implementation.

2.6 Collection and Transport of E-Waste

All e-waste containers designated for off-site shipment should be secured and labelled with the contents and associated hazards, be properly loaded on the transport vehicles before leaving the

site, and be accompanied by a shipping paper (i.e., manifest) that describes the load and its associated hazards, consistent with the Transport of Hazardous Materials good practices and guidance as defined in the World Bank Groups Environmental .

2.7 Treatment and Disposal

If e-waste materials are still generated after the implementation of feasible e-waste prevention, reduction, reuse, recovery and recycling measures, e-waste materials should be treated and disposed of, and all measures should be taken to avoid potential impacts to human health and the environment. Selected management approaches should be consistent with the characteristics of the e-waste and local regulations, and may include one or more of the following:

- On-site or off-site chemical, or physical treatment of the e-waste material to render it non-hazardous prior to final disposal
- ii) Treatment or disposal at permitted facilities specially designed to receive the e-waste,
- iii) E-Wastes; properly designed, permitted and operated landfills or incinerators designed for the respective type of e-waste; or other methods known to be effective in the safe, final disposal of e-waste materials.

The project will ascertain and document the methodology followed by any third part certified agency that will facilitate in the treatment and disposal of e-waste over the project period.

2.7.1 Specific Treatment for Hazardous E-Waste

In addition to the recommendations for treatment and disposal applicable to general wastes, the following issues specific to hazardous e-wastes should be considered, while as there are certified E-waste processing parties available.

In the absence of qualified commercial or government-owned e-waste vendors (taking into consideration proximity and transportation requirements), facilities generating e-waste should consider using the following:

1. Have the technical capability to manage the e-waste in a manner that reduces immediate and future impact to the environment, and have all required permits, certifications, and approvals, of applicable government authorities.
2. Have been secured through the use of formal procurement agreements In the absence of qualified commercial or government-owned e-waste disposal operators (taking into consideration proximity and transportation requirements), project sponsors should consider using: Installing on-site e-waste treatment or recycling processes.

2.8 Budget and Costs

In each phase of the project a budget with the costs for the provisions of this Guideline, must be prepared, specifically for each managerial action proposed. These budgets must be prepared in charts showing costs estimations categorized for each managerial activity presented, including those contingency expenditures and expending charted chronogram. The budget will be itemized, following the project administrative/financial organization protocols and submitted for World Bank review with the diagnostic survey during the first 6 months of project implementation.

2.9 Awareness and Training for Users

The information provided to the project implementing units within the MoECCT and NCIT should be done via internal mailers as well as for E-waste handling procedures via communication material such as posters for offices, copies of equipment management guides etc.

The E and S Specialist of the project team will work with the Communication Specialist to design all communication material in line with the implementation of this Guideline. Good International Industry Best Practice and examples will be used on design and communication.

At minimum the following training plans will be undertaken.

Training Program	Target Audience	Mode	Comments
Training Program on E-Waste and the Use of the E-Waste Guideline	Project Coordinating Teams and all relevant units within NCIT and MOECTT	Virtual/Face to Face- 2–3-hour session	To be conducted by the PMU team and World Bank E and S Specialists
Training on E-Waste Management Innovation and Examples	Project Coordinating Teams and all relevant units within NCIT and MOECTT- Open to wider NCIT Staff and Maldives EPA	Virtual/Face to Face-1-2 day program	To be conducted by E-Waste Specialist

3 Implementing Arrangement and Compliance Monitoring Requirements

3.1 Project Implementation.

The MoECCT will be responsible for leading the overall implementation of this project, specifically through the NCIT, which reports to the MoECCT. The Project Management unit (PMU) will be responsible for all fiduciary matters as well as monitoring and evaluation and safeguards.

While the MoECCT, through the PMU, will be leading the overall project implementation, other government agencies (beneficiaries) will be actively involved in the implementation of specific subcomponents in close collaboration with the NCIT. More specifically, CAM will be an implementing partner for Component 1.1, and DNR an implementing partner for Subcomponents 2.1. Each digital public service to be improved under Component 2 will be represented by a focal point, which will work directly with the NCIT to ensure quality, user friendliness, and appropriateness of platform capabilities. At the same time, NCIT will provide product management to ensure user-centricity by applying iterative development to prioritize user needs and learn what works as quickly as possible.

A Steering Committee chaired by the Minister of Ministry of Environment, Climate Change and Technology will be created to carry out high-level monitoring of the project implementation. The steering committee will include the Minister of Environment, Climate Change and Technology, the Ministry of National Planning, Housing & Infrastructure and the Ministry of Finance. The steering committee will meet twice per year and will only facilitate monitoring. It will not be engaged in operational decision making but will provide guidance for strategic pivots in the project implementation if needed.

The PMU will have a project director, procurement and fiduciary management specialists, environment and social (E and S) specialist, project coordinators and communications specialist. In addition, for each implementation partner an E and S focal point will be identified.

3.2 Implementation of the Guideline

The Implementation of this Guideline with be the responsibility of all projects implementing parties and direct oversight will be with the projects Environmental and Social Specialist who will be housed within the PMU. He/She will work closed with all E and S focal points, ensure all provisions of the guideline are implemented within the project, organize and conduct trainings, prepare the requisite monitoring updates to the World Bank as per the guideline and maintain a direct line of communication with the World Bank team.

3.3 Compliance Monitoring

Monitoring activities associated with the management of hazardous and non-hazardous e-waste should include the key steps specified below. Regular visual inspection of all e-waste storage collection and storage areas for evidence of accidental releases and to verify that e-wastes are properly labelled and stored.

When significant quantities of hazardous e-wastes are generated and stored on site, monitoring activities should include:

i) Inspection of loss or identification of cracks, corrosion, or damage to protective equipment, or floors,

ii) Verification of locks, and other safety devices for easy operation (lubricating if required and employing the practice of keeping locks and safety equipment in standby position when the area is not occupied)
iii) Checking the operability of emergency systems o Documenting results of testing for integrity, emissions, or monitoring stations,
iv) Documenting any changes to the storage facility, and any significant changes in the quantity of materials in storage,
v) Regular audits of e-waste segregation and collection practices,
vi) Tracking of e-waste generation trends by type and amount of e-waste generated, preferably by facility departments,
vii) Characterizing e-waste at the beginning of generation of a new e-waste stream, and periodically documenting the characteristics and proper management of the e-waste, especially hazardous e-wastes
viii) Keeping manifests or other records that document the amount of e-waste generated and its destination,

All third-party treatment, and disposal service including re-use and recycling facilities when significant quantities of hazardous e-wastes are managed by third parties will need to have the certification with the Maldives Environmental Protection Agency.

In the event e-waste is in contact with the soil these additional monitoring procedures must be performed, to avoid the e-waste storage facilities should be in a indoor location which works better also in terms of the context of Male:

- Monitoring of soils quality in cases of Hazardous E-waste on site storage and/or pre-treatment and disposal will be undertaken.

Monitoring records for hazardous e-waste collected, stored, or shipped should include:

i) Name and identification number of the material(s) composing the hazardous e-waste o Physical state
ii) Quantity (i.e., kilograms, number of containers),
iii) E-waste shipment tracking documentation to include, quantity and type, date dispatched, date transported and date received, record of the originator, the receiver and the transporter,
iv) Method and date of storing, repacking, treating, or disposing at the facility, cross-referenced to specific manifest document numbers applicable to the hazardous e-waste o Location of each hazardous e-waste within the facility, and the quantity at each location

4 Annexes

Annex 1: Do's and Don'ts of E-Waste Recycling

5 References

- Environmental Waste Management, Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines. International Finance Corporation, World Bank Group (IFC-WBG), 2007
- South Africa E-Waste Industry Management Plan V-1. Waste Policy and Information Management, Department of Environmental Affairs, 2014
- Environmental and Social Management Framework (ESMF) to be used under the Caribbean Digital Transformation Program (P171528) (CARDTP)- 2020
- Strategic Action Plan (2019). President's Office. Government of Maldives.
- Waste Management Bill (Draft). 2022.