1. INTRODUCTION

A. What is E-waste?

EEE is a term used to describe the wide variety of products that contain circuitry or electrical and electronic components that require a power or battery supply in order to perform their functions. Once EEE is discarded by its owner without the intention of reusing it, it becomes e-waste, which requires separate collection and treatment as it contains scarce, valuable and hazardous materials.

EEE, including ICTs, offer opportunities for development worldwide as they provide access to information for use in science, technology and innovation and foster regional and international cooperation and knowledge sharing that benefits productivity and economic development. EEE includes almost all products available for use in households and businesses, such as laptops, mobile telephones, refrigerators, washing machines, dishwashers and kitchen appliances, as well as toys, servers and musical instruments. Nowadays, even smart clothes and furniture contain electronic components. Over the past couple of decades, the production and use of EEE have increased tremendously, supporting the rapid development of many sectors, including ICT, electric vehicles, clean energy production, medicine and smart cities.

EEE includes a wide range of products with circuitry or electrical components with a power or battery supply. EEE becomes e-waste once it has been discarded by its owner as waste without the intent of reuse.

Once EEE is discarded by its owner without the intention of reusing it, it becomes waste EEE, also referred to as electronic waste or e-waste (Step Initiative 2014). ITU and the legally binding definition of the Basel Convention also defines e-waste or WEEE as "electrical or electronic equipment that is waste, including all components, sub- assemblies and consumables that are part of the equipment at the time the equipment becomes waste"[(2)]. The way that each type of e-waste has to be collected, treated, disassembled, recycled and disposed of using ESM approaches is affected by the size of the waste and the hazardous components and scarce and valuable materials that it contains.

[(2)] Recommendation ITU-T L.1031/L.1032 and Technical guidelines on transboundary movements of electrical and electronic waste and used electrical and electronic equipment, in particular regarding the distinction between waste and non-waste under the Basel Convention (2014).

E-waste encompasses a wide variety of discarded products, which fall into six main categories. E-waste may be categorized in different ways, including by product type or size. EU Directive 2012/19/EU, on waste electrical and electronic equipment, (known as the WEEE Directive) and the guidelines on classification, reporting and indicators for e-waste statistics use a treatment-oriented categorization, with six main categories as shown below (Baldé et al. 2015; Forti, Baldé and Kuehr 2018):

1. Temperature exchange equipment, including fridges, freezers, air conditioners, and heat pumps.

2. Screens and monitors, comprising liquid crystal displays (LCDs) and light-emitting diodes (LEDs) used in televisions, monitors, laptops and tablets.

3. Lamps, including LED lamps, high intensity discharge lamps, compact fluorescent lamps and straight tube fluorescent lamps.

4. Large equipment, including dishwashers, washing machines, ovens, central heating systems, large printing systems and photovoltaic panels.

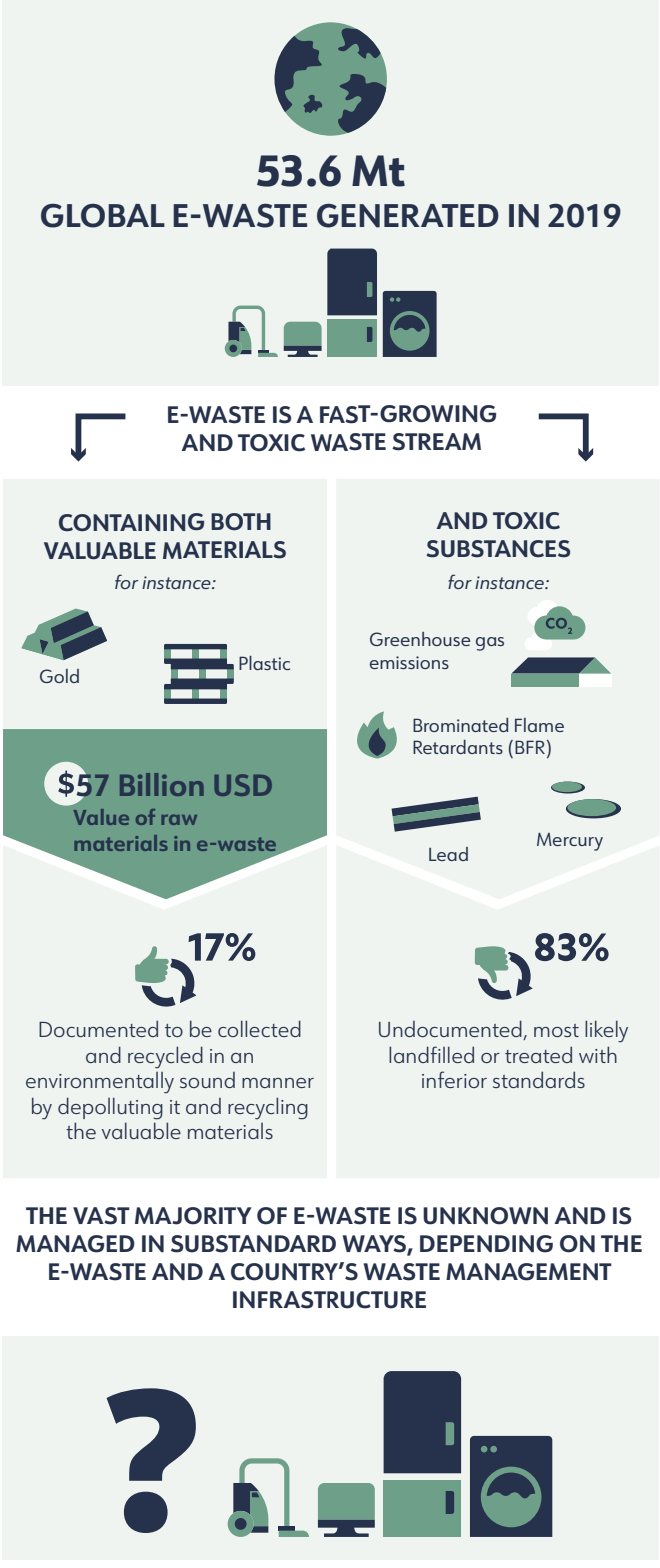
5. Small equipment, comprising microwaves, grills, toasters, personal care products, speakers, cameras, audio sets, headphones, toys, household tools, medical equipment and monitoring systems.

6. Small information technology (IT) and telecommunication equipment, including desktop personal computers, printers, mobile telephones, cordless telephones, keyboards, routers and consoles.

B. E-waste: An International Issue

E-waste constitutes one of the fastest growing streams of solid waste in the global environment. Only about 17 per cent of e-waste was documented as having been collected and recycled in 2019 (Forti et al. 2020). EEE, including equipment used for ICT services, offer opportunities for global development, guaranteeing higher living standards, improve medical treatment, quicker logistics, easier worldwide communication and just-in-time trading, among other things. However, discarded equipment, such as telephones, laptops, sensors, televisions, washing machines, air conditioners, refrigerators, that contain hazardous substances pose considerable risks to human health and the environment, especially when managed inadequately.

The 2020 edition of the Global E-waste Monitor highlighted that a record 53.6 million Mt of e-waste was generated in 2019, an increase of 21 per cent compared with 2014 (Forti et al. 2020). This is linked to the growing number of individuals who are using EEE worldwide, the constant rate of technological development and the phasing out of old technologies, leading to shorter product lifecycles and designs that do not support repair or reuse. The majority of the e-waste not recycled or disposed through an ESM approach is sent to landfill, mixed with other waste streams or incinerated. As a consequence, valuable resources, such as precious metals and rare earth elements, are wasted, and hazardous substances are released into the environment in a way that poses a risk to human health and the environment.



Source: Forti et al. 2020, Global E-waste Monitor 2020

Managing e-waste requires specific legislation and collection infrastructure. In general, e-waste is, unfortunately, poorly regulated and enforced at global level.

As e-waste is a complex and relatively recent waste stream, countries need to introduce specific legislation to enforce ESM treatment and management of e-waste. In 2019, 78 countries (71 per cent of the global population) were covered by legislation, policies or regulation on e-waste, compared with 67 countries (66 per cent of the population) in 2017. Nevertheless, in most cases, policies are neither legally binding nor appropriately supported financially, which has been found to reduce the likelihood of ensuring their implementation and compliance. Furthermore, most legislative instruments concentrate on improving e-waste management, but not reducing the volume of e-waste generated. Most legislation and policies do not fully consider practices such as the repair and reuse of EEE, even though such practices are favourable according to the globally supported waste hierarchy.

E-waste management is monitored under Sustainable Development Goal 12 on ensuring sustainable consumption and production patterns.

In 2015, United Nations member States adopted the 2030 Agenda for Sustainable Development. This included the 17 Sustainable Development Goals (SDGs) and 169 targets for ending poverty, protecting the planet and ensuring prosperity for all over a 15-year span. Increasing e-waste generation and adopting improper and unsafe treatment and disposal approaches pose significant challenges to human health and the environment and to the achievement of the SDGs. E-waste management closely relates to many SDGs, such as SDG 8 on decent work and economic growth, SDG 3 on good health and well-being, SDG 6 on clean water and sanitation and SDG 14 on life below water. Considering the high raw material demand for EEE production, e-waste also relates to the SDG indicators on material footprints (8.4.1 and 12.2.1) and domestic material consumption (8.4.2 and 12.2.2). Consequently, e-waste remains a global challenge, not only because of its increasing generation worldwide, but also because proper treatment and generation prevention requires the active engagement of a diverse set of actors, sometimes going beyond national borders. The management of e-waste is therefore monitored under SDG 12, in particular indicators 12.5.1 on national recycling rates and 12.4.2 on hazardous waste generation (Forti et al. 2020; UNEP 2021).

ITU's Connect 2030 Agenda[3] includes Target 3.2 on increasing the global e-waste recycling rate to 30 per cent by 2023 and Target 3.3 on raising the number of countries with an e-waste legislation to 50 per cent by 2023.

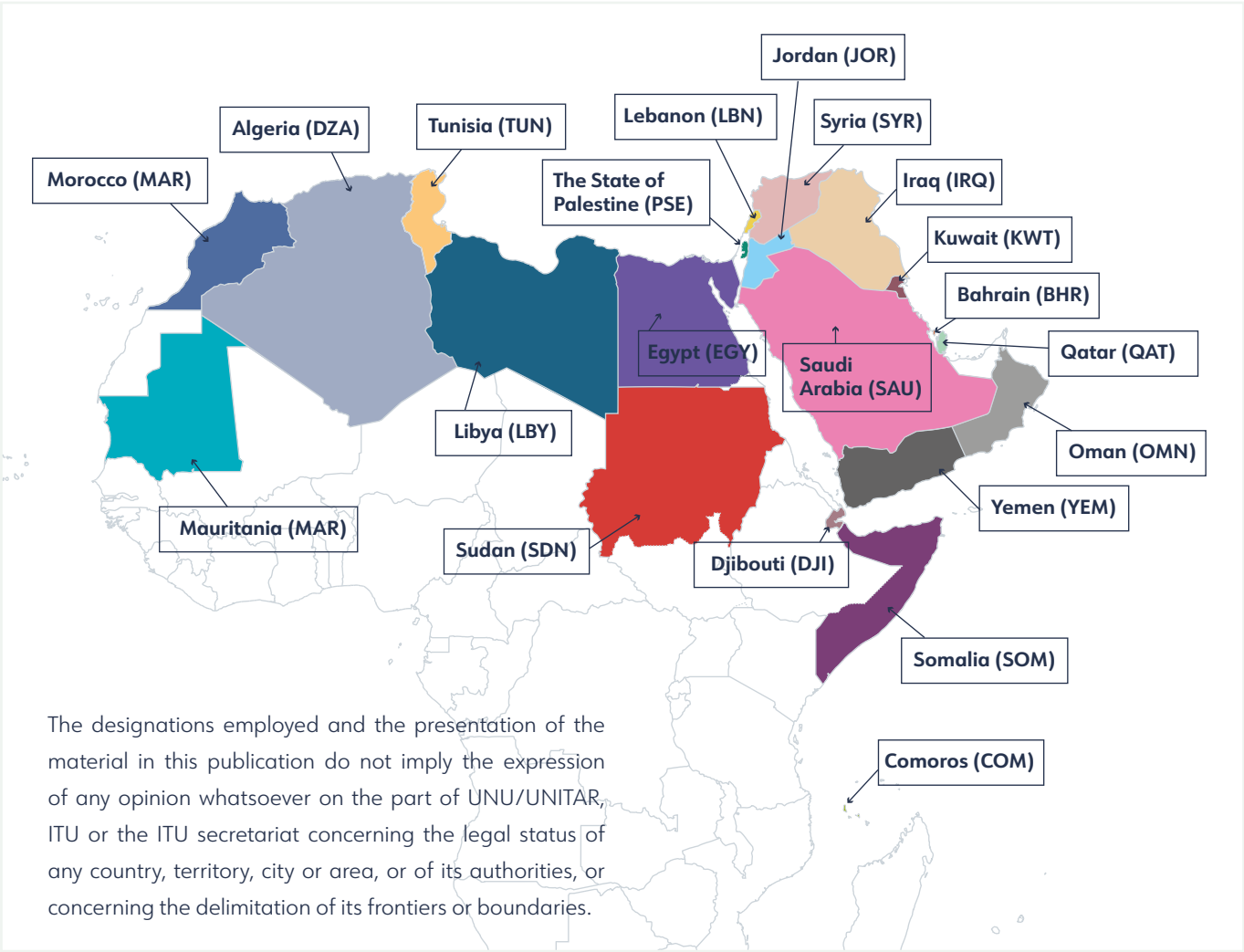
[3] Connect 2030 Agenda: https://www.itu.int/en/mediacentre/backgrounders/Pages/connect-2030-agenda.aspx.

C. Framework condition for the Arab States

This regional e-waste monitor for the Arab States covers 21 countries, plus the State of Palestine[4], which are members of the League of Arab States.

The monitor covers Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, the State of Palestine, Qatar, Saudi Arabia, Somalia, Sudan, the Syrian Arab Republic, Tunisia, the United Arab Emirates and Yemen. The Arab States region stretches from the Atlantic Ocean in the west to the Arabian Sea in the east, and from the Mediterranean Sea in the north to the Indian Ocean in the south-east.

The Arab League, officially the League of Arab States, is a union of Arabic-speaking countries. It was formed in Cairo in 1945 to promote the independence, sovereignty, affairs and interests of its members (Britannica n.d.). The mission of the Arab League is to promote trade and economic growth, as well as sovereignty and political stability, in the region. As of 2021, the Arab League consists of 22 member States, including the State of Palestine, and five observer countries. These are all predominantly Muslim and Arabic-speaking. Through agreements on joint defence, economic cooperation and free trade, among others, the Arab League helps its members to coordinate government and cultural programmes to facilitate cooperation and limit conflict.



The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of UNU/UNITAR, ITU or the ITU secretariat concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

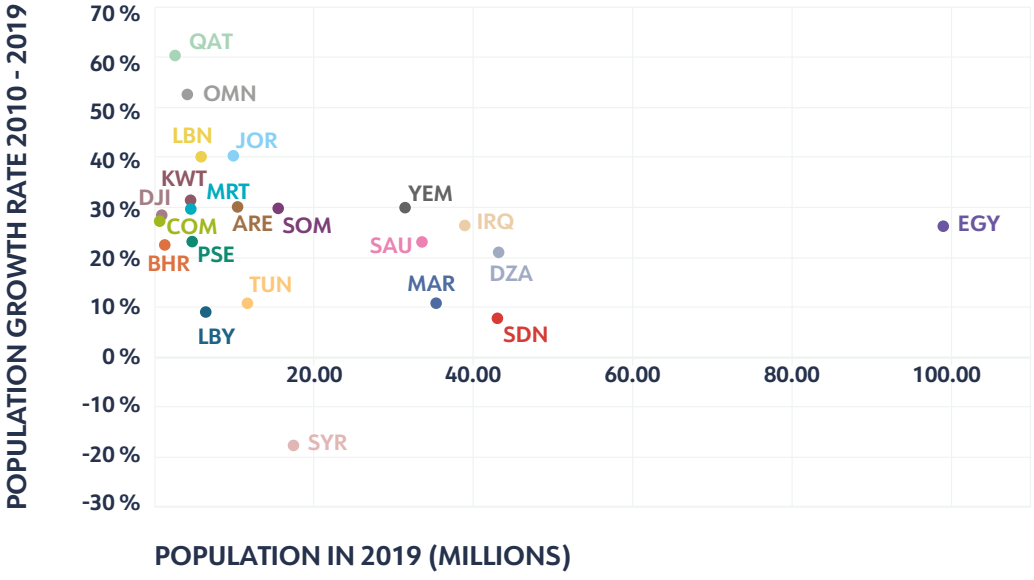
[4] See Resolution 99 (Rev. Dubai, 2018), on the status of Palestine in ITU.

The Arab States region has 429.5 million inhabitants as of 2019, with the most populous being Egypt (99.2 million) and the least populous being Comoros (870 000). The population of the Arab States region grew by 21 per cent between 2010 and 2019.

The Arab States region has 429.5 million inhabitants in 2019.

The Arab States region is located in northern Africa and in Asia, with a total area of 13.1 million km^2 (World Bank 2018). By area, Algeria is the largest Arab State, with a total surface area of 2.4 million km^2. The smallest is Bahrain, which covers just 780 km^2. After Egypt, Algeria is the second most populous country (43.4 million inhabitants), closely followed by Sudan (43.2 million inhabitants). (See Figure 1.) Qatar has the highest growth rate (61 per cent), followed by Oman (52 per cent) and Lebanon and Jordan (both at 40 per cent), while Sudan has the slowest growth (8 per cent). As a result of civil war, however, the population of the Syrian Arab Republic decreased by 18 per cent between 2011 and 2019, as over 5 million individuals sought refuge in other countries (Devadas, Elbadawi and Loayza 2019).

Figure 1. Demographic overview of the Arab States region



The x-axis shows the population in 2019, and y-axis shows the population growth rate between 2010 and 2019.

Inhabitants in the Arab States region have varying levels of access to electricity and the Internet, in addition to disparities in growth rates, poverty levels and gross domestic product (GDP) adjusted for purchasing power parity (PPP)[5], which ranges from USD 1 000 to USD 118 000.

Most of the population of the Arab States region (more than 99.8 per cent) has access to electricity, with the exception of Comoros, Djibouti, Libya, Mauritania, Somalia, Sudan, the Syrian Arab Republic and Yemen (World Bank 2019). (See Figure 2.) Socio-economic development indices for the Arab States also vary widely; GDP adjusted for PPP ranges from USD 1 000 year in Comoros to USD 118 000 per year in Qatar. (See Figure 3.) The region shows an average growth rate of GDP adjusted for PPP of 29 per cent between 2010 and 2019. According to the World Bank, four of the Arab States are considered low income countries (Somalia, Sudan, the Syrian Arab Republic and Yemen), eight are low-middle income countries (Algeria, Comoros, Djibouti, Egypt, Mauritania, Morocco, Tunisia and the State of Palestine), four are upper-middle income countries (Iraq, Jordan, Lebanon[6] and Libya) and six are high-income countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) (World Bank 2021b).

Figure 2. Population with access to electricity in the Arab States region

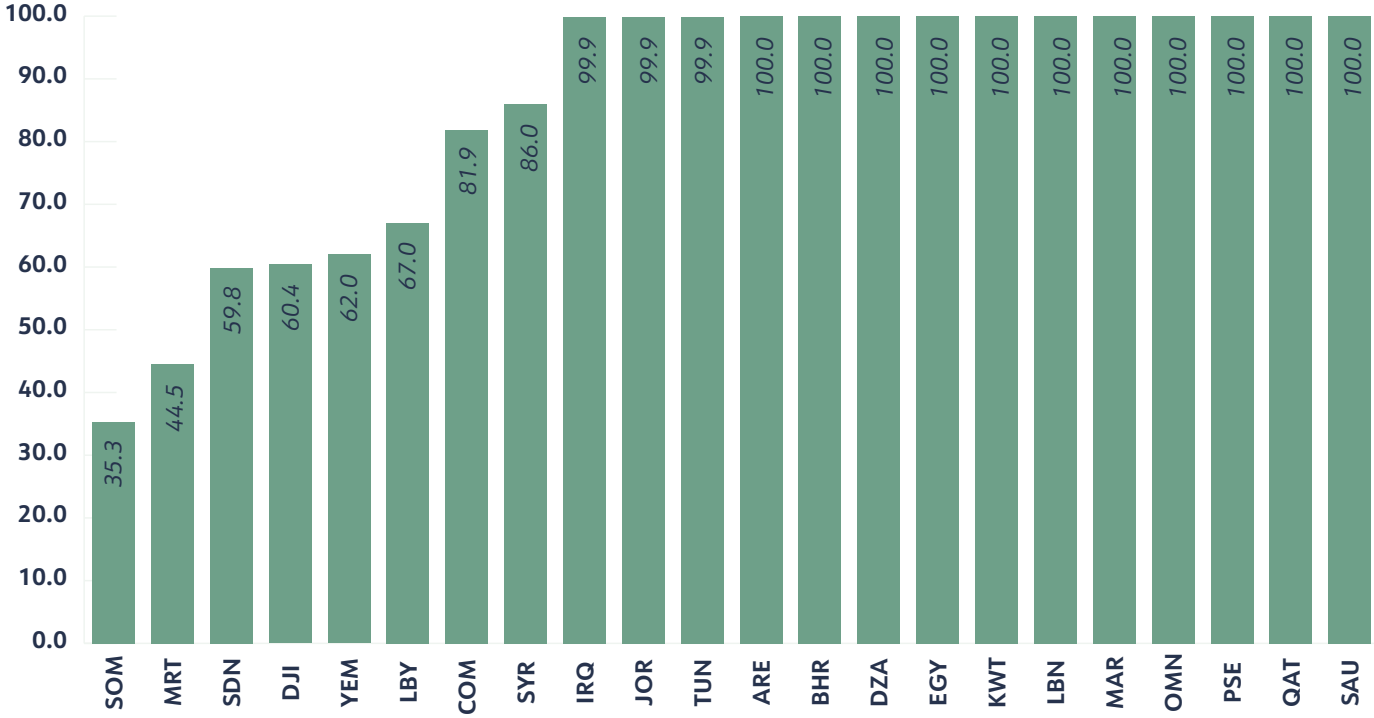


Figure 2 shows the proportion of the population in each State or territory with access to electricity.

[5] PPP is an economic indicator that can be used to compare economic productivity and standards of living between different States, territories and locations. GDP figures can be adjusted to reflect PPP.

[6] Following the financial, social and political crisis which began in 2019, Lebanon is likely to be downgraded to a low-middle income country (World Bank 2021a).

Figure 3. Economic overview of the Arab States region

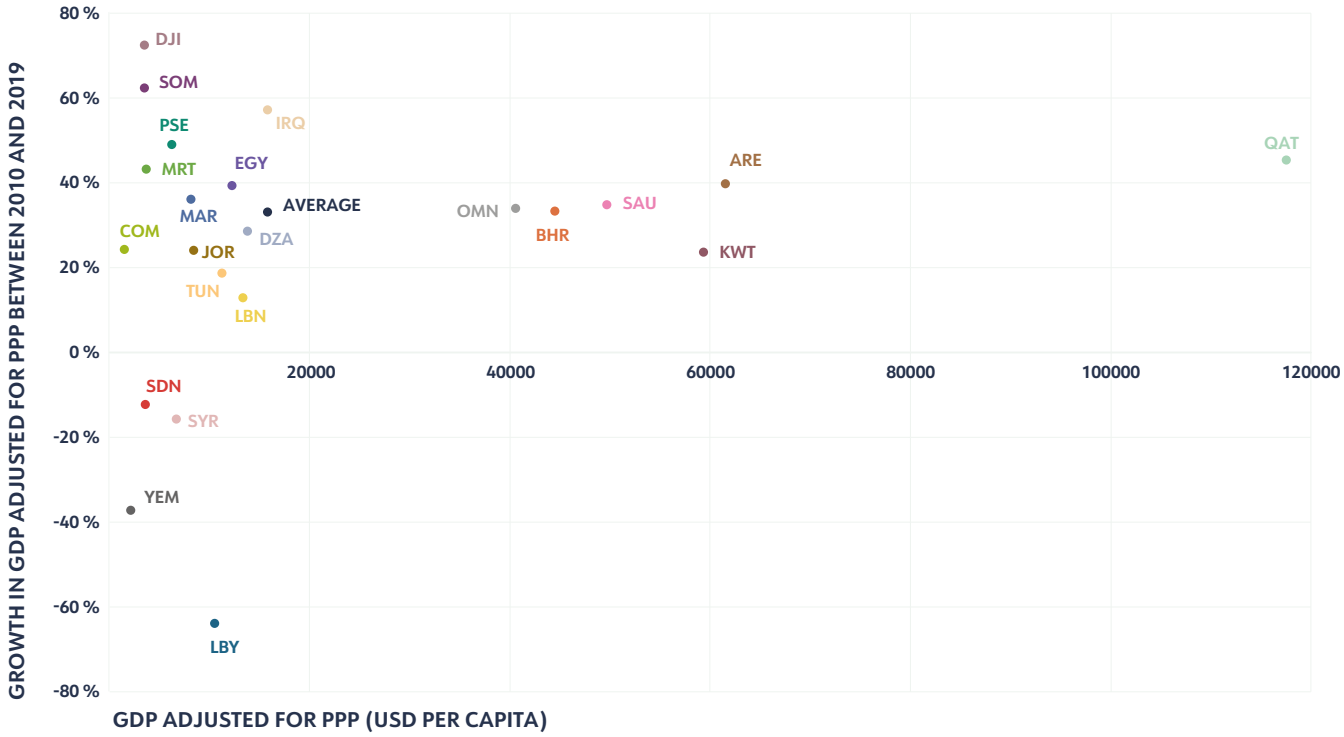


Figure 3 shows GDP per capita adjusted for PPP in United States dollars as of 2019 along the x-axis and the total growth rate of GDP adjusted for PPP between 2010 and 2019 along the y-axis.

D. Background to the report

Within the framework of the ITU Arab Regional Initiative on environment, climate change and emergency telecommunications and the Global E-waste Statistics Partnership, ITU has partnered with UNU-ViE SCYCLE to implement this regional e-waste monitor for the Arab States, with the aim of building regional capacity in collecting e-waste statistics for use by government officials and statisticians and improving e-waste data and statistics in the region.

In particular, this monitor reviews the current situation of e-waste legislation and management in the Arab States, analyses trends in the transboundary movement of e-waste within and into Arab States and provides periodic monitoring on collected e-waste statistics information. It also presents a summary of the e-waste status in the region. This report was prepared in collaboration with governments, national statistical offices, independent experts and recyclers in participating States. It will allow for international comparisons and will facilitate the development of e-waste management systems. It presents an overview of projects and initiatives on e-waste that have taken place in the region in recent years.

Chapters 3 and 4 of this report present a summary of statistics and the transboundary movement of e-waste in participating States. Chapter 5 provides an assessment of e-waste legislation in all participating Arab States. Chapter 6 presents a further assessment of e-waste management on the basis of indicators related to the legislative framework and the infrastructure for 11 States (Algeria, Egypt, Jordan, Lebanon, Mauritania, Oman, Qatar, Saudi Arabia, Sudan, the United Arab Emirates and the State of Palestine). Chapter 7 summarizes the common challenges faced, and Chapter 8 sets out recommendations for e-waste management in the region. The annexes describe the mathematical equations used in the methodology, summarize the data presented in the report and set out the country profiles for Mauritania and Sudan, which, as least developed countries in the region, were selected for in-depth analysis.