



Synopsis: National SDG Costing Framework



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Economic and Social Commission for Western Asia

Synopsis: National SDG Costing Framework



United Nations
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Introduction

With the conclusion of the first quadrennial review of the 2030 Agenda for Sustainable Development, several recommendations have been put forth. Chief among them is the need to:

1. Improve the evaluation and analysis of evidence-based assessments to provide a holistic, yet detailed, appreciation of the cost of achieving a country's sustainable development priorities.
2. Exploit interlinkages and harness lost opportunities.
3. Canvass the outcome of this effort into actionable reform agendas through integrated national financing frameworks (INFFs).

The present document advances an integral framework to address the first recommendation (i.e.: costing national sustainable development priorities), and a separate document details the contours of the SDG optimization tool developed to capture and harness SDG interlinkages. The two documents should be read in conjunction with each other. The present document begins by providing an overview of the rationale, methods, data coverage and scope of the national SDG costing framework. In the following section, the document furnishes a detailed description of how the numeric estimates and projections are undertaken by ESCWA (the United Nations Economic and Social Commission for Western Asia) with respect to the national sustainable development priorities identified by the Government of Egypt. To provide a comparable basis for assessment, the framework is applied consistently across the Arab region.

1. Scope, Methods and Rationale

Several methods have been employed to cost the SDGs. However, aggregate figures for SDG costs mask significant disparities, and a granular examination at the national level is needed (HLPF, 2019). The range of published national estimates remains wide, reflecting differences in scope, methodologies, targets, baselines and non-additivity and other assumptions. Some of the salient methods employed in this field include back-of-the-envelope methods based on estimating Incremental Capital-Output Ratios (ICORs) that link a certain level of investments to the achievement of certain variables; Input-Output Elasticities (I-OE) that furnish costing estimates derived from historical budgets; other methods relying on the costs of similar actions taken by comparable economies or geographical areas; some rely on unit-cost analysis, and others on growth or descriptive econometric models. As far as the literature is concerned, none of the methodologies can be deemed comparable, and no single method can be applied across the broad spectrum of sustainable development priorities.

According to the United Nations there is no consensus on which methodology works best to cost the SDGs at the national and regional levels. Partly, this is because of the lack of consistent datasets, the trade-offs between the ease of use and rigor of different models employed and questions of how to interpret their results in national contexts. According to the World Economic Situation and Prospects report (2019), relying on a single measure or methodology to assess all types of financing gaps associated with different SDGs renders distorted results. The Inter-Agency Task Force on Financing for Development adds that there cannot be a substitute for much-needed country-level costing employing different methods sensitive to the targets or national priorities being measured. Moreover, the methods that are considered easier to implement cannot capture some desirable technical aspects of integrated models. In contrast, integrated models are relatively difficult to interpret and calculate. In the final count, there is no single tool that uniquely establishes a comprehensive measure of the costs associated with national sustainable development priorities; rather, there are several, and no single methodology can amalgamate financial and non-financial means of implementation (E/ESCWA/EDID/2018/TP.5).

Nevertheless, the national SDG costing framework advanced in the present document takes its cues from the United Nations Task Force on the 2030 Agenda, the Working Group on SDG Costing and Financing, the Inter-Agency Task Force on Financing for Development, the Sustainable Development Solutions Network Costing and Financing Team and the costing guidelines published by ESCAP and ECLAC (Annex). This framework adopts an intuitive multi-disciplinary approach that relies on an integrated set of methods from a range of disciplines, intervention-based tools and empirical models applied in a consistent and dynamic manner across time and space to reach an assessment of a country's financing needs in order to achieve its SDGs. The framework is based on a relatively elaborate costing sequence (figure 1) that draws firstly on the costing methodologies and estimates adopted by national authorities with respect to achieving particular sustainable development priority targets. These estimates are then compared to the costing estimates rendered

by United Nations specialized agencies, institutional stakeholders and SDG custodians with respect to achieving a particular priority target in the country.

Figure 1. Costing sequence



For instance, the framework relies on the WHO (World Health Organization)-Lancet methodology to cost health-related targets, notably the cost of achieving universal health coverage (UHC) as advanced by the Egyptian Universal Health Insurance Law of 2018; FAO (Food and Agriculture Organization), IFAD (International Fund for Agricultural Development) and WFP (World Food Program) methodologies to estimate the cost of achieving zero hunger; World Bank methods to calculate the cost of reducing poverty; UNCTAD (United Nations Conference on Trade and Development), the WTO (World Trade Organization) and ITC (International Trade Centre) methods to cost untapped trade potentials and the target of doubling non-traditional exports; UNESCO (United Nations Educational, Scientific and Cultural Organization) methods for targets related to investing in education; UNPF (United Nations Population Fund), WEF (World Economic Forum) and ESCWA methods to cost gender-related targets to name a few. The costing approach is based on an extensive screening exercise of the costing methodologies applied both for the Arab region and beyond, including the costing methods developed by the International Monetary Fund for Egypt and those adopted by UNDP to develop the INFFs.

When these country-specific agency methodologies are not available, the framework estimates the costs of nationally defined SDG priority targets based on data and projections furnished by regional inter-governmental organizations and national and international think tanks that have pursued similar work to assess the cost and financing needs of the particular target and country in the costing exercise. A data set is built to extrapolate two scenarios into the future (a business-as-usual scenario and an SDG optimizing scenario that satisfies the indicator(s) being assessed up until 2030). Projections of the business-as-usual scenarios are based on World Economic Situation and Prospects 2021 report,¹ elasticities or the SDG trend dashboard.² The size of the gap between the two scenarios is used to quantify the cost/financing requirements associated with a national priority.

1 United Nations Department of Economic and Social Affairs, 2021.

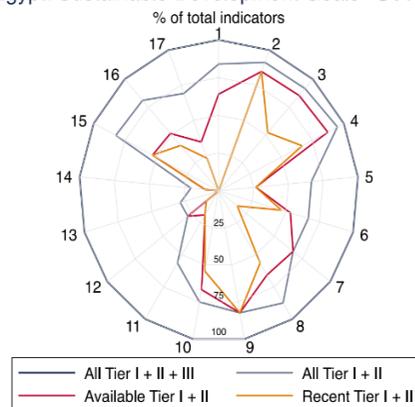
2 Sachs, J. and others, 2018.

While the framework follows a defined sequence to render assessments and 2030 projections to estimate the cost of achieving national sustainable development priorities, it remains cognizant that terms such as “spending”, “expenditures”, “investment needs” and “financing” are often used interchangeably, even though each has a distinct technical meaning. Cost estimates do not necessarily capture or are intended to divert attention from crucial questions of resource efficiency or quality of design in governance, policy and programmes. Moreover, the SDG framework concedes that some SDGs lack numerical targets, leaving room for subjective judgment to be determined as “nationally appropriate”, and the same applies to national sustainable development strategies, sectoral plans and macro-economic frameworks. For this purpose, the costing framework estimates the benchmarks and thresholds established by national authorities for up to two targets per SDG for which enough data points are available to allow for the 2030 projections and simulations, although the recent structural reform programme announced by the Egyptian government has not yet been fully factored into the costing framework.

This multi-disciplinary approach to costing national sustainable development goals and targets is not followed out of convenience, but rather dictated by the Government’s priority targets as articulated through the 2030 Vision, sectoral plans, strategies and frameworks developed by the Government.³ The choice of the costed priority targets, nevertheless, remains bound by the fact that:

1. Only 42 per cent of indicators in Tier I with established methodologies have consistent trend data according to the IAEG-SDG (Inter-agency and Expert Group on SDG Indicators). However, despite the fact that Tier 1 indicator data is conceptually clear and relies on internationally established methodologies, the data produced by the UN statistical division remains restricted by the very definition that categorizes Tier I indicators as those that are produced for at least 50 per cent of countries and of the population in every region where the indicator is relevant.

Egypt: Sustainable Development Goals Coverage



Source: World Bank Staff predictions with UN-SDG Data. March 22, 2017.

³ “Sustainable development strategy: Egypt’s vision 2030 and planning reform”, “Renewable Energy Outlook: Egypt”, “Egypt Constitution of 2014”, “Medium-Term Strategy for Sustainable Development”, “National Water Resources Plan 2017”, “Strategy for Managing Water Scarcity – National Water Resources Plan (NWRP 2017-2037)”, “Egypt’s National Voluntary Report 2018”, “Egypt’s National Voluntary Report 2016”, “Sustainable Development Strategy: Egypt Vision 2030”, “National Environmental Action Plan (NEAP)”, “Sustainable Energy Strategy 2035”, “National Energy Efficiency Action Plan (NEEAP)”, “National Urban Development Plan 2052”, “Egyptian Biodiversity Strategy and Action Plan 2015-2030”, “National Strategy for Combating Violence Against Women”, “Egypt’s Nationally Determined Contribution”, “Sustainable Agricultural Development Strategy towards 2030”, “National action plan for sustainable consumption and production”, Egypt’s “Macro-economic Framework (2014-2019)”; the 2022 Strategic Framework to Double National Income; The 2052 Strategic National Plan for Urban Development; The 2030 National Population Strategy; The 2025 Industrial Development Strategy; The 2020 Agricultural Sector Transformation Strategy and the 2020 Trade Development Strategy.

2. The first national statistical report from Egypt on the availability of data for the SDG indicators (May 2018) shows that data were available for only 35.7 per cent of Tier I indicators. According to Arab countries' SDG data sets and statistical surveys, 18 per cent of indicators are fit for SDG trend and projection analysis, and only 28.3 per cent of the total indicators (69 indicators) are available for 50 per cent of the countries, although some have only two data points. For 112 indicators, it is not possible to perform either a trend analysis due to lack of data and/or non-quantifiable targets. Of these 112 SDG indicators, 67 are classified as Tier III, 34 are Tier II and 11 are Tier I. The availability of time series data for SDGs 1, 10, 11, 12, 13, 14, 16 and 17 ranges from 47.8 per cent (SDG 16) to only 10 per cent (SDG 14). Accordingly, the figures presented in this document offer a baseline estimate of the costs associated with pursuing national SDG.
3. Based on the aforementioned, the data employed for the costing exercise is based on data sets provided by the UN statistical department and is supplemented by data from national authorities and institutional stakeholders and complemented by data published by the SDG custodians, either through their studies, tools or dashboards. The data employed is factual and does not include attempts at interpolation.

2. Data Sources for Macro-economic Indicators and Costing Approach

In order to estimate the costs of the Sustainable Development Goals (SDGs), several macroeconomic time series are required. These time series and their projections come from the most reliable sources of data, such as the United Nations World Economic Forecasting Model (Altshuler and others, 2016).⁴

Projections of SDG costs in Egypt rely on the projection round for the World Economic Situation and Prospects 2021 report adopted by the United Nations Department of Economic and Social Affairs⁵ and the projected population growth in the Egyptian National Population and Development Strategy.⁶

WESP 2021 Data:

1. GDP (current local currency unit (LCU), current USD, constant LCU, constant USD).
2. Exchange rate (USD per LCU).
3. GDP deflator.
4. Inflation rate (CPI).

⁴ Altshuler, Clive and others, 2016.

⁵ United Nations Department of Economic and Social Affairs, 2021.

⁶ Egypt, Ministry of Population, 2015.

3. Costing Methodology

SDG 1: End poverty in all its forms everywhere

Targets and indicators

Target 1.2: By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to **national definitions**.

- Indicator 1.2.1 Proportion of population living below the national poverty line, by sex and age;
- Indicator 1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.

Formula

$$Cost = 0.5 * Poverty\ Headcount * \theta * ((NPL * (1 + infl)) \div EXR) * 365 * Population$$

Where Poverty Headcount is the percentage of the population living below the poverty line; θ is the poverty gap measuring the average shortfall of the total population from the poverty line; NPL is the national poverty line, $infl$ is inflation; and EXR is the EGP/USD exchange rate.

Justification and data sources

Metrics:

1. **The national poverty headcount ratio (P_0)** measures the proportion of the population living below the national poverty line. It is popular because it is easy to understand and measure. But it does not indicate how poor the poor are. The projections of poverty headcount are based on the national poverty headcount to growth elasticity.
2. **The poverty gap index (P_1)** measures the extent to which individuals fall below the poverty line as a proportion of the poverty line. The sum of these poverty gaps gives the minimum cost of eliminating poverty, if transfers were perfectly targeted. However, the measure does not reflect changes in inequality among the poor. For the purpose of the calculations, the poverty gap is assumed to be constant over the period 2020-2030 at 20.4 per cent (table 1).

Table below shows the change in these indicators over time in Egypt.

Main poverty indicators in Egypt, 2015-2019

	2005	2009	2011	2013	2015	2019
Poverty Headcount	20%	22%	25%	26%	28%	33%
Poverty Gap ^a	4%	4%	5%	5%	6%	7%
Ratio of Poverty Gap to Poverty Headcount	18%	19%	20%	20%	20%	20%

Source: ESCWA calculations based on CAPMAS data.

^a El-Laithy, Heba and Dina Armanious, 2018.

Projections of the **National poverty headcount ratio** are based on GDP projections (as described in section 2) and the growth elasticity of poverty (GEP), assuming there are no changes in the distribution of poverty. GEP is calculated by dividing the percentage change in poverty rates by the percentage change in GDP/income per capita in Egypt over the period 1995-2018.

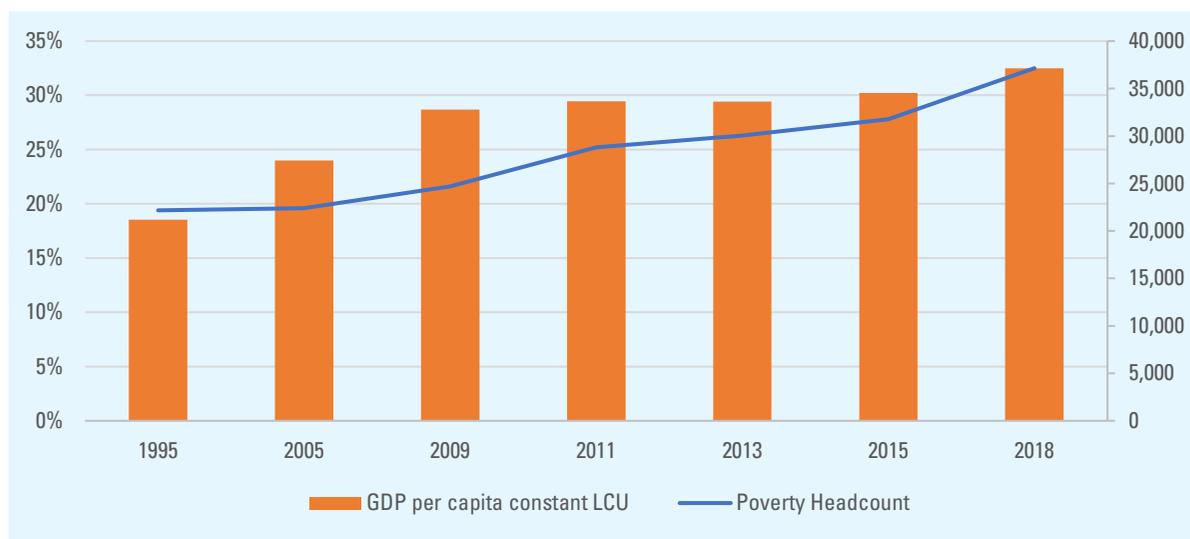
The GEP in Egypt, estimated using national data, is 0.896. Notably, Egypt is the only country in the region with a positive growth elasticity of poverty, meaning that, in recent decades, poverty has risen in Egypt despite economic growth (figure 2). This phenomenon appears to be paradoxical, as it is contrary to what is observed in other countries, where economic growth is often associated with a decline in poverty. Several studies point to a multitude of reasons for this phenomenon in Egypt:

- Increases in prices have not been matched by increases in wages: high inflation in Egypt is the main factor driving up poverty since 2005 as it led to lower real wages and higher prices in rural and urban areas;⁷
- Despite high economic growth, the Egyptian economy has not been able to provide productive employment for its fast-growing labour force;⁸
- The rural labour force has been growing at a faster pace than the urban labour force, but rural areas have not seen a commensurate increase in labour-intensive jobs. The disparity between the growth of the labour force and the availability of productive employment is a major explanation for continued poverty in Egypt.

7 World Bank and Egypt, Ministry of Economic Development, 2010.

8 Bargawi, Hannah and Terry McKinley, 2011.

Figure 2. GDP per capita (constant EGP) and poverty headcount in Egypt, 1995-2018



Source: GDP per capita (constant EGP) WESP 2021; Poverty headcount CAPMAS.

SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Targets and indicators

Target 2.a: Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries.

- Indicator 2.a.1: The agriculture orientation index for government expenditures;
- Indicator 2.a.2: Total official flows (official development assistance plus other official flows) to the agriculture sector.

Formula

$$Cost = (Inv_{ideal} - Inv_{baseline})$$

$$Inv_{baseline} = (1 + \xi) * Inv_{baseline-1}$$

Inv_{ideal} – ideal investment in agriculture in current prices as described in the Egyptian Sustainable Development Plan

$Inv_{baseline}$ – baseline investment in agriculture projected by ESCWA using the SDG trend Dashboard developed by the Sustainable Development Solutions Network⁹

ξ – annual baseline growth of investment in agriculture of 6 per cent

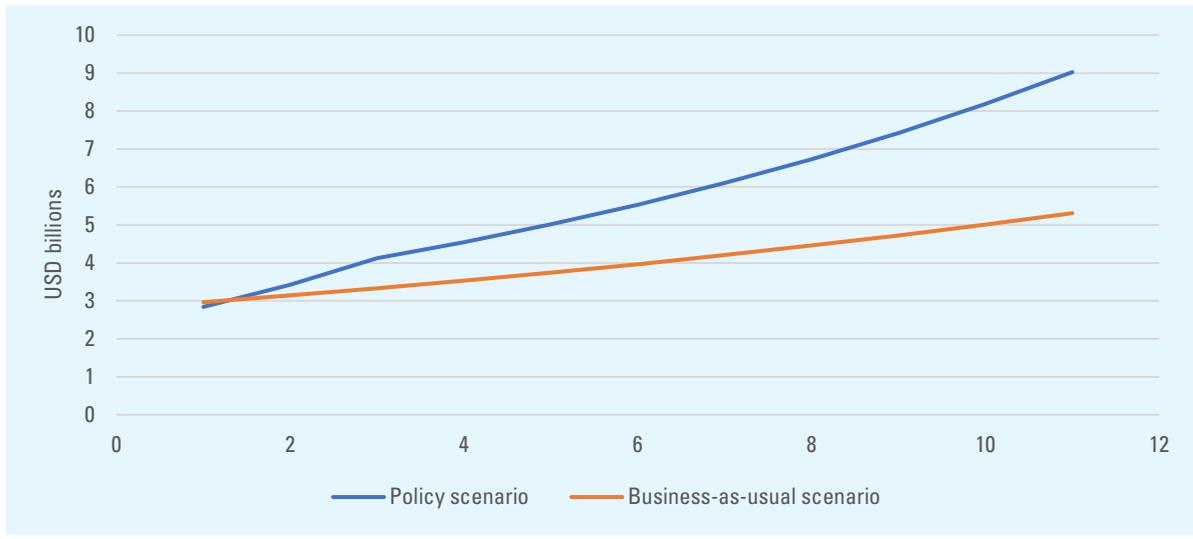
Justification and data sources

The financing gap in agricultural investments is estimated by the difference between two scenarios: (i) policy scenario with targeted annual investments in agriculture per the amounts in the Egyptian Sustainable Development Plan¹⁰ and (ii) the business-as-usual scenario (BAU) where the projected annual investments in agriculture are based on a yearly increase of 6 per cent for the period 2007-2019 (using the compounded annual growth rate formula (CAGR)). The difference between these scenarios is the additional annual investment needed to achieve this target. These scenarios are shown in figure 3.

⁹ Sachs, J. and others, 2018.

¹⁰ Egypt, Ministry of Planning and Economic Development, 2015.

Figure 3. Investment needed in agriculture (USD billions, current prices)



Source: ESCWA, based on the Egyptian Sustainable Development Strategy.

SDG 3: Ensure healthy lives and promote well-being for all at all ages

Targets and indicators

Target 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

- Indicator 3.8.1 Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population);
- Indicator 3.8.2 Proportion of population with large household expenditures on health as a share of total household expenditure or income.

The cost of achieving

Out-of-pocket health expenditures are estimated as a percentage of GDP – It is given by the government.

Formula

$$Cost = Population * (OOP_{ideal} - OOP_{baseline})$$

Where:

$OOP_{baseline}$ – out-of-pocket health expenditures per capita (baseline scenario)

OOP_{ideal} – out-of-pocket health expenditures per capita (ideal scenario)

Justification and data sources

The cost of universal health coverage (UHC) is estimated using the World Health Organization (WHO) definition, which refers to the process of ensuring that all people have access to health services of sufficient quality (including for the purpose of prevention, promotion, treatment, rehabilitation and palliation) while ensuring that these services do not, in themselves, expose beneficiaries to financial hardship. Achieving universal health coverage is defined as the cost of gradually eliminating out of pocket health expenditures.

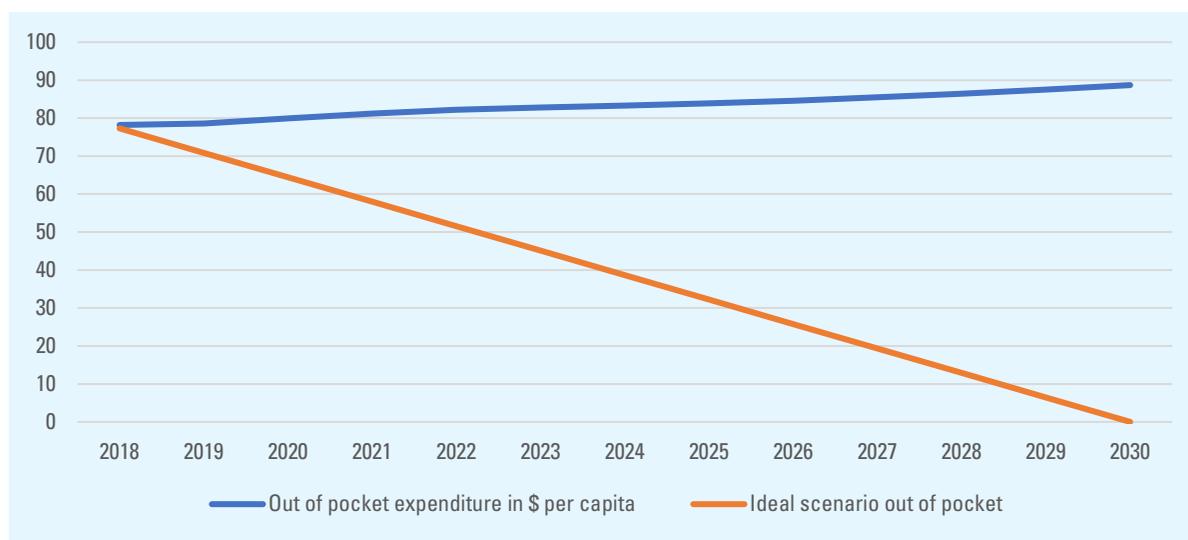
Current health per capita expenditures in Egypt are estimated to be USD 128 in 2018, of which the estimated out of pocket marginal health spending per capita amounts to USD 78.2.¹¹ To estimate the

¹¹ World Bank, World Bank Open Data, Washington, D.C.

future cost of gradually achieving universal health coverage, the per capita current health expenditure is assumed to grow by 4 per cent annually until 2030.¹²

The financing gap is estimated by the difference between two scenarios: (i) the business-as-usual scenario (BAU), where out-of-pocket health expenditure is estimated as a percentage of current health expenditure leveraging on the SDG trend Dashboards developed by Sustainable Development Solutions Network (with 4 per cent annual growth in health spending per capita), and (ii) the policy scenario, which assumes that out of pocket expenditures on health are reduced to zero by 2030. The cost of this goal is estimated by the difference in these two scenarios.

Figure 4. Out-of-pocket health expenditures per capita (Current USD)



Source: ESCWA estimations.

12 Global Burden of Disease Health Financing Collaborator Network, 2017.

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Targets and indicators

Target 4.1: By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.

- Indicator: 4.1.1 Proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex.

Formula

$$Cost = GDP_{current\$} * (Exp_{ideal} - Exp_{baseline})$$

$Exp_{baseline}$ – Government education expenditures as a percentage of GDP (baseline scenario)

Exp_{ideal} – Government education expenditures as a percentage of GDP (ideal scenario)

$GDP_{current\$}$ – GDP (current USD)

Justification and data sources

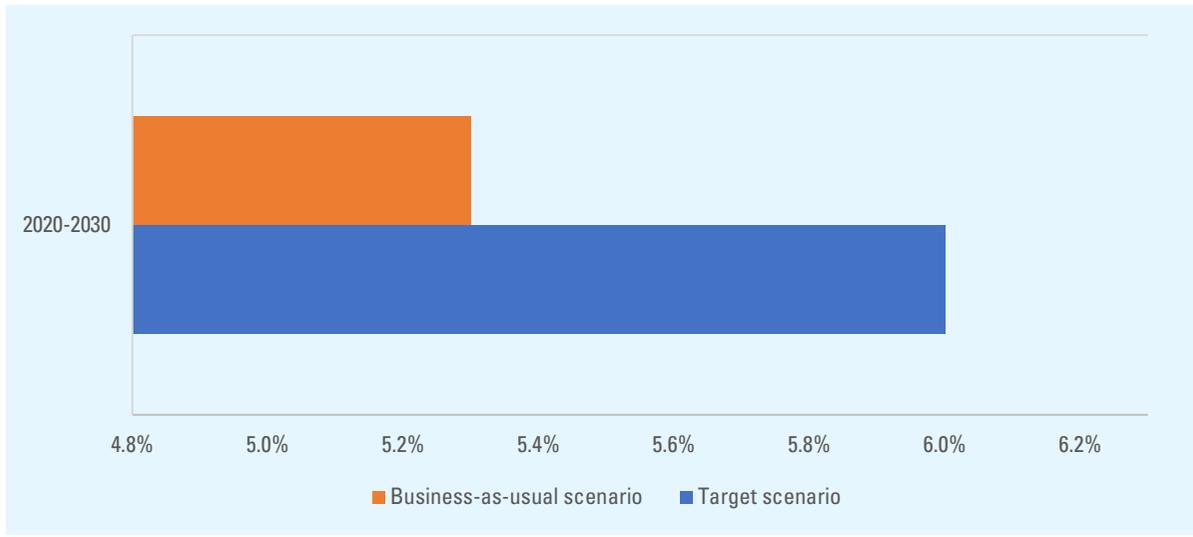
The Egyptian Constitution (2014)¹³ sets an annual target of 6 per cent of GDP to be allocated to education, with 4 per cent in primary and secondary and 2 per cent in tertiary education. For the 2019/2020 and 2020/2021 years, the Egyptian government expenditure on education was 5.3 per cent of GDP annually.¹⁴

The financing gap is estimated by the difference between two scenarios: (i) the business-as-usual (BAU) scenario, where the government expenditure on education remains unchanged at 5.3 per cent of GDP, and (ii) the policy scenario that assumes that government expenditure on education is 6 per cent of GDP over the whole period. Figure 5 depicts the comparison of both scenarios.

¹³ Egypt, Constitution of 2014.

¹⁴ Egypt, Ministry of Finance, Budget Statement, 2020.

Figure 5. Education expenditures (Per cent of GDP)



Source: ESCWA's calculations based on the Egyptian constitution and ESCWA estimates.

SDG 5: Achieve gender equality and empower all women and girls

Targets and indicators

Target 5.2: Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation.

- Indicator 5.2.1 Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age.

Formula

$$Cost = Population * \frac{\alpha(1 + GDP_{deflator})}{EXR}$$

Where:

α – initial per capita cost of achieving SDG 5 is set at 68 EGP¹⁵

EXR – EGP/USD exchange rate

$GDP_{deflator}$ – GDP deflator

Justification and data sources

The costing is based on a study conducted by the United Nations Population Fund and the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS), which estimated that 7.8 million women in Egypt suffered from violence from husbands/partners, individuals in close surroundings or strangers in public spaces. These estimates are based on microdata from a survey that estimated the following costs:¹⁶

- The cost of health services required;
- The cost of property replacement;
- The cost of legal and judiciary proceedings;
- The cost of local and community services;
- The cost of community services;
- The cost of shelter;
- The cost of missed working days;
- The cost of domestic workdays lost.

¹⁵ UNFPA, Egypt, CAPMAS and the National Council for Women, 2015.

¹⁶ These estimates were discussed with ESCWA Cluster 2: Gender justice, population and inclusive development cluster.

These costs were estimated at the individual level as opposed to the household level. The study further calculated the total cost of violence against women to be **EGP 6.15 billion**. The total cost of violence against women was divided by the total population.

$$\alpha = \frac{\textit{Total cost}}{\textit{Total Population}}$$

SDG 6: Ensure access to water and sanitation for all

Targets and indicators

Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

- Indicator 6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water.

Formula

$$\begin{aligned}
 \text{Total Cost} = & \sum_{n=1}^{n=12} \frac{(\pi_{urban} + \Delta Pop_{urban}) \times \alpha_{urban} \times (1 + infl)^n}{EXR} \\
 & + \sum_{n=1}^{n=12} \frac{(\pi_{rural} + \Delta Pop_{rural}) \times \alpha_{rural} \times (1 + infl)^n}{EXR}
 \end{aligned}$$

Where:

π_{urban} – initial urban population without access to safely managed sanitation, spread out over 12 years

π_{rural} – initial rural population without access to safely managed sanitation, spread out over 12 years

ΔPop_{urban} – increase in urban population in year n

ΔPop_{rural} – increase in rural population in year n

α_{urban} – initial cost of urban sanitation (World Bank Water and Sanitation Program)

α_{rural} – initial cost of rural sanitation (World Bank Water and Sanitation Program)

EXR – EGP/USD exchange rate

$infl$ – inflation

Justification and data sources

The additional spending required by the Egyptian government to achieve universal improved sanitation is estimated using data from the water and sanitation program of the World Bank.¹⁷ These estimates are divided in rural and urban areas as follows:

1. **Rural:** The estimated unit costs were validated by in-country experts and provided in constant prices. The cost per capita for rural population is estimated at \$436 in 2015 prices for either pit latrine with sewage and treatment or pit latrine with fecal sludge management (FSM).
2. **Urban:** The per capita cost of sanitation in urban Egypt is estimated at \$534 in 2015 prices for sewage with treatment or septic tank with fecal sludge management (FSM).

The World Bank estimates that in 2017 38.6 million Egyptians did not have access to improved sanitation, of whom 26.4 million lived in rural areas.¹⁸ Furthermore, it is assumed that the share of urban and rural population as a share of the total population remains unchanged over the 2020-2030 period, and that the government fully improves sanitation over the 2020-2030 period.

17 Hutton, Guy and Mili Varughese, 2016.

18 World Bank, World Bank Open Data, Washington, D.C.

SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Targets and indicators

Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.

- Indicator 7.2.1 Renewable energy share in the total final energy consumption;
- 7.a: By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.

Formula

$$Cost = (Exp_{ideal} - Exp_{baseline})$$

Exp_{ideal} – targeted expenditures as provided by REmap (Renewable Energy Roadmap) as provided by IRENA in its Renewable Energy Outlook for Egypt.¹⁹

Exp_{baseline} – baseline expenditures, as projected by ESCWA leveraging on the SDG trend Dashboards methodology developed by Sustainable Development Solutions Network.

Justification and data sources

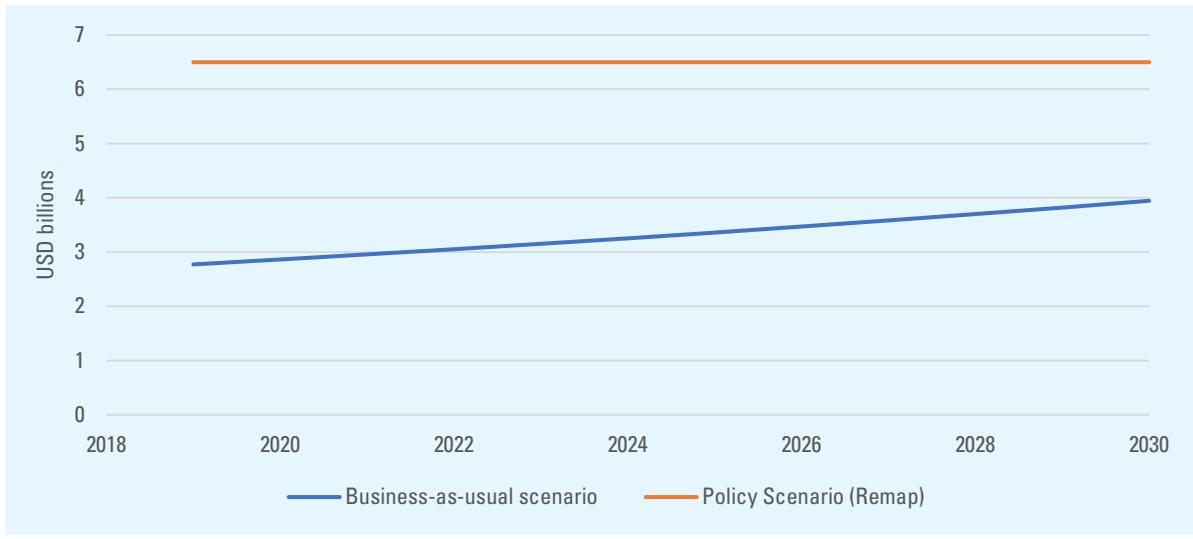
In 2018, the Egyptian Ministry of Electricity and Renewable Energy and the International Renewable Energy Agency (IRENA), with support from the New and Renewable Energy Authority (NREA), conducted an analysis of the needs of the renewable energy sector in Egypt.

The aforementioned report assumes two distinct scenarios: (i) Business as usual and (ii) Policy scenario – REmap. The financing gap is estimated by the difference between these two scenarios.

The REmap indicates that the investments in renewable energy capacity over the period would have to be raised to USD 6.5 billion per year with accelerated deployment of renewables. The difference between the two scenarios is depicted in figure 6.

¹⁹ International Renewable Energy Agency, 2018.

Figure 6. Renewable energy expenditures (USD)



Source: ESCWA calculations, based on IRENA.

SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Targets and indicators

Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.

- Indicator 8.5.2 Unemployment rate, by sex, age and persons with disabilities.

Formula

$$Cost = \max \{(1 + \Delta RGDP) * RGDP_{-1} * GDP_{deflator} - NGDP_{proj}, 0\}$$

Where:

$\Delta RGDP$ – GDP growth needed to achieve desired level of unemployment, calculated through the following equation:

$$\Delta RGDP = \frac{8.7 - U}{0.429}$$

$RGDP_{-1}$ – real GDP in previous year

$GDP_{deflator}$ – GDP deflator (Source: UN/DESA World Economic Forecasting Model (WEFM))

$NGDP_{proj}$ – nominal GDP (Source: UN/DESA World Economic Forecasting Model (WEFM))

Justification and data sources

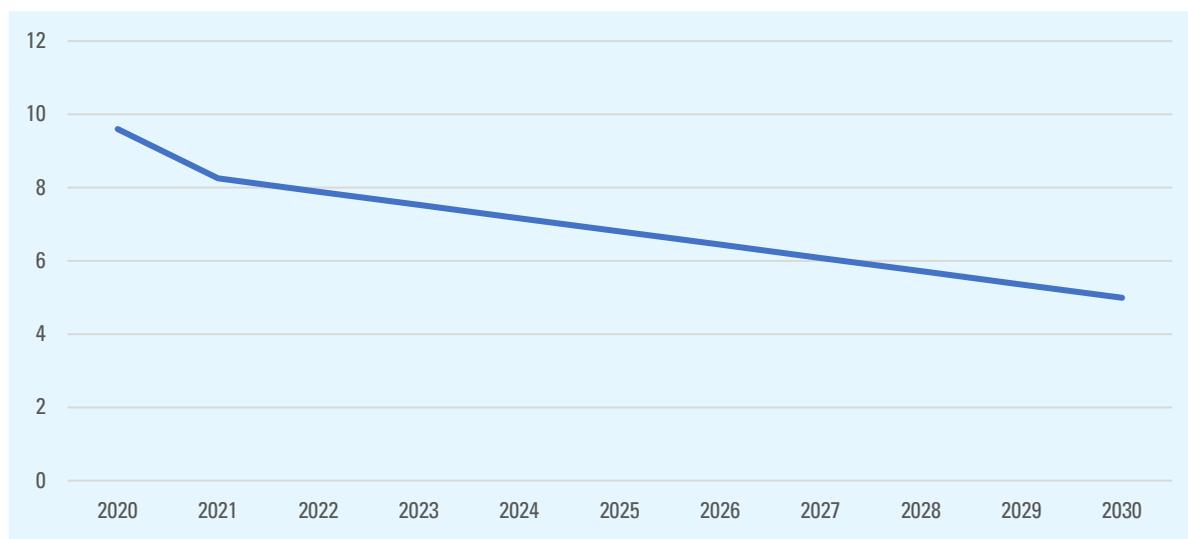
To achieve goal 8, the cost of eliminating unemployment is estimated. Okun's law is used to predict how the unemployment rate will change over time. The formula yields the elasticity between unemployment and growth, i.e. the reduction in unemployment associated with economic growth. The estimates indicate that a 1 per cent increase in GDP reduces unemployment by 0.429 percentage points.²⁰ The coefficient is estimated based on data from 2001 to 2016 using International Labour Organization (ILO) and World Bank sources.

The most recent unemployment figure for Egypt is 9.6 per cent. The Egyptian government plans to reduce unemployment to 5 per cent by 2030 (assuming the path as shown in figure 7). In order to reduce unemployment from 9.6 to 5 per cent, Okun's law provides an estimate of the GDP growth necessary.

²⁰ Schillings, Tobias, 2018.

The financing gap is estimated by comparing the estimated GDP growth required to reduce unemployment to 5 per cent as suggested by Okun's law, compared to the GDP growth forecasted by the United Nations World Economic Forecasting Model (WEFM).²¹ These estimates are in turn converted to nominal USD.

Figure 7. Unemployment levels targeted by the Egyptian Government, 2020-2030



Source: ESCWA estimates.

21 United Nations Department of Economic and Social Affairs, 2021.

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Target and indicators

Target 9.2: Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries.

- Indicator 9.2.1 Manufacturing value added as a proportion of GDP and per capita;
- Indicator 9.2.2 Manufacturing employment as a proportion of total employment.

Formula

$$Cost = VA_{\{MAN,target\}} - VA_{\{MAN,baseline\}}$$

$$VA_{\{MAN,i\}} = VA_{\{MAN,i-1\}} * (1 + growth_i)$$

$VA_{\{MAN,target\}}$ – value added in manufacturing – target

$VA_{\{MAN,baseline\}}$ – value added in manufacturing – baseline

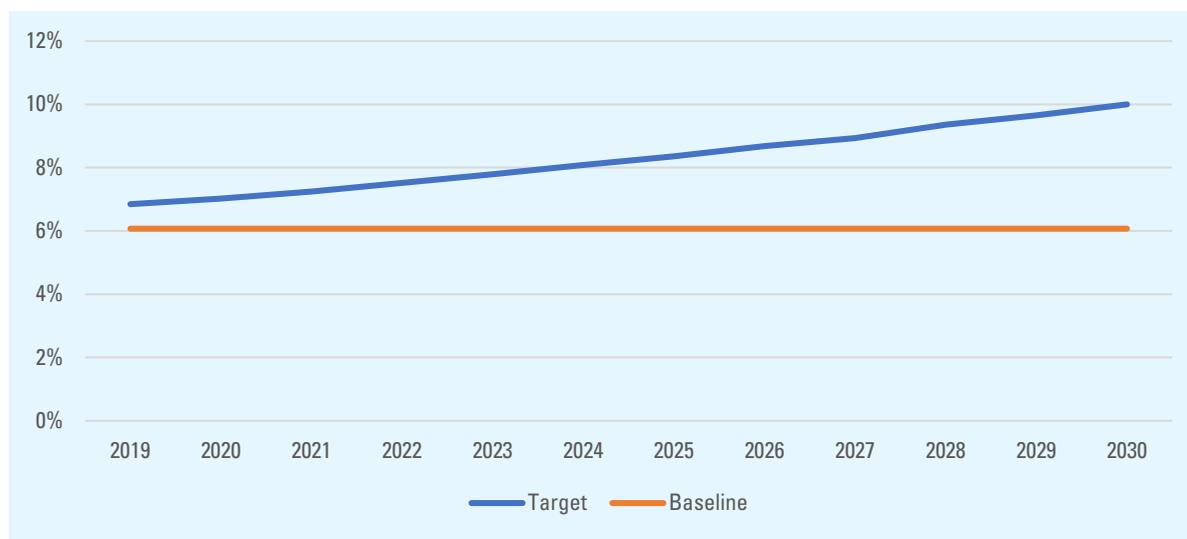
Justification and data sources

Egypt Vision 2030 sets a medium-term manufacturing growth target of 7 per cent by the year 2020. In the long-term, it sets a growth target in manufacturing of 10 per cent by the year 2030.

The financing gap is estimated by the difference between two scenarios: (i) the business-as-usual scenario, which is estimated by projecting the manufacturing value added using the SDG Trend Dashboards methodology developed by LaFortune and others (2018). This scenario estimates an annual growth rate of 6 per cent, bringing the manufacturing value added to \$83 billion by 2030 (using the compounded annual growth rate formula (CAGR)); and (ii) the policy scenario, which assumes two different growth paths. The first assumes 7 per cent annual growth in manufacturing value added for the period 2018-2020, while the second assumes a gradual increase in manufacturing value added growth from 7 per cent in 2020 to 10 per cent growth by 2030.

Figure 8 depicts the differences between these scenarios.

Figure 8. Manufacturing value added (Per cent of GDP)



Source: ESCWA calculations based on the Egyptian Sustainable Development Strategy and ESCWA estimates.

Target 9.5: Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.

- Indicator 9.5.1 Research and development expenditure as a proportion of GDP;
- Indicator 9.5.2 Researchers (in full-time equivalent) per million inhabitants.

Formula

$$Cost = GDP_{current\$} * (Exp_{ideal} - Exp_{baseline})$$

Exp_{ideal} – target R&D expenditures as a percentage of GDP

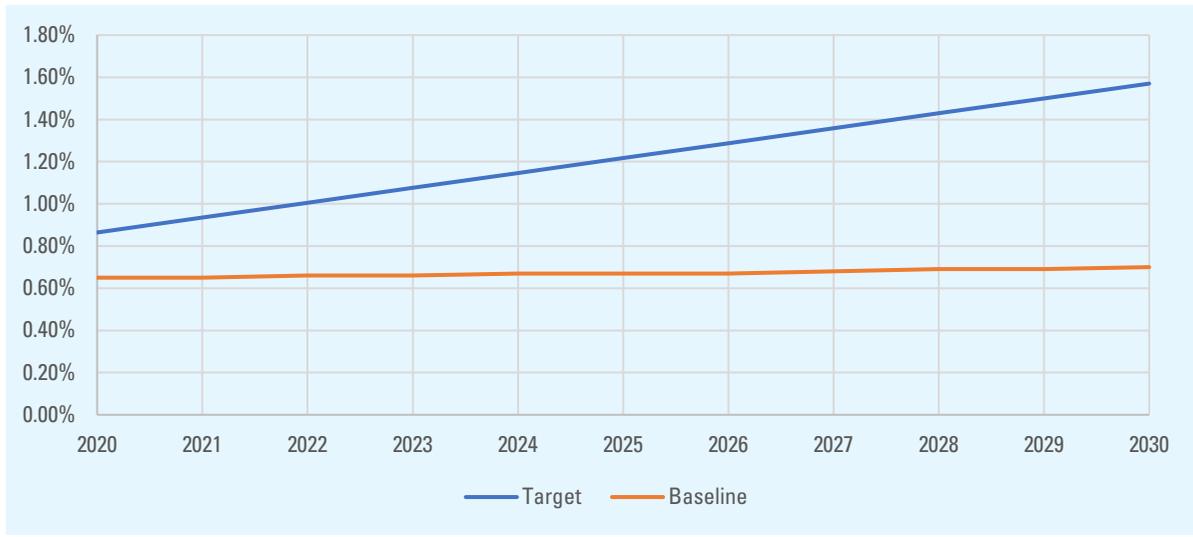
$Exp_{baseline}$ – baseline R&D expenditures as a percentage of GDP

Justification and data sources

The R&D financing gap is estimated by the difference between two scenarios: (i) the business-as-usual scenario, where research and development expenditures are kept constant as a percentage of GDP, and (ii) the target scenario, which assumes a gradual increase of the expenditures on research and development from the current level to 1.57 per cent by 2030, to match the average spending by middle income countries on research and development as a share of GDP.²² Figure 9 illustrates the gap between the two scenarios.

²² World Bank. World Bank Database, Washington, D.C. Available at <https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?locations=XP>.

Figure 9. R&D expenditures (Per cent of GDP)



Source: ESCWA elaboration.

SDG 10: Reduce inequality within and among countries

Targets and indicators

Target 10.b: Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes.

- Indicator 10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows).

Formula

$$Cost = FDI_{target} - FDI_{baseline}$$

FDI_{target} – target foreign direct investment as stipulated by the Egyptian government in its Medium-Term Strategy for Sustainable Development 2018-2022²³ and its Sustainable Development Strategy.

$FDI_{baseline}$ – baseline FDI projected by the SDG interlinkages tool (ESCWA, 2020).

Justification and data sources

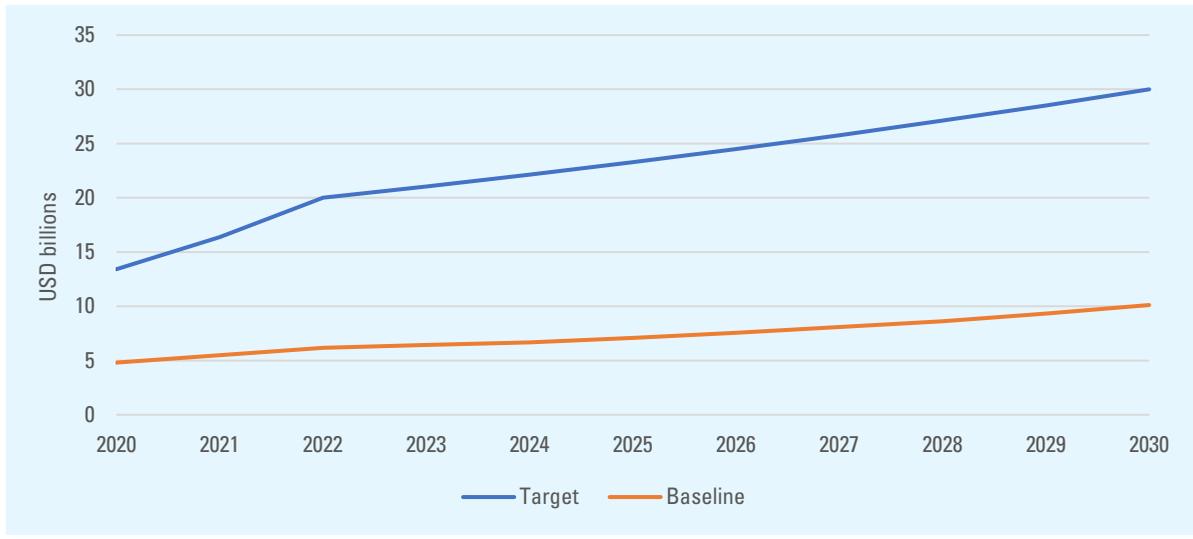
The Egyptian government anticipates that foreign direct investment (FDI) inflows to Egypt will amount to \$20 billion by 2022, while the long-term economic plan expects an FDI inflow of \$30 billion by 2030.

The financing gap is estimated by the difference between two scenarios: (i) the business-as-usual scenario with the FDI projections in ESCWA (2020)²⁴ and (ii) a policy scenario, where FDI in Egypt reaches the target set by the Egyptian government of \$30 billion by 2030 (Sustainable Development Strategy). Figure 10 depicts these two scenarios.

²³ Egypt, Ministry of Planning and Economic Development, 2015.

²⁴ United Nations Economic and Social Commission for Western Asia, 2020.

Figure 10. Foreign direct investment, 2020-2030 (USD)



Source: ESCWA (2020) and Egyptian Sustainable Development Strategy.

SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Targets and indicators

Target 11.1: By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

- Indicator 11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing.

Formula

$$Cost = \frac{\alpha}{11 * EXR}$$

α – total cost of EGP 350 billion for the Egyptian Slum Development Fund (SDF)

EXR – EGP/USD exchange rate

Justification and data sources

The Egyptian government estimates the cost of upgrading slums at 350 billion EGP by 2030.²⁵ This number is converted to USD using the exchange rate as described in section 2.

²⁵ Egypt, Informal Settlements Development Fund, 2021.

SDG 13: Take urgent action to combat climate change and its impacts

Targets and indicators

Target 13.2: Integrate climate change measures into national policies, strategies and planning.

- Indicator 13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other).

Formula

$$Cost = \frac{\alpha}{11}$$

α – total cost of USD 73 billion for the Egyptian Intended Nationally Determined Contribution (NDC) for climate change

Justification and data sources

Egypt's Nationally Determined Contribution for both adaptation and mitigation is estimated at USD 73 billion over the 2020-2030 period, adjusted for inflation.²⁶

²⁶ Egypt, Egyptian Intended Nationally Determined Contribution as per United Nation Framework Convention on Climate Change, 2015.

SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Targets and indicators

Target 15.4: By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.

- 15.4.1 Coverage by protected areas of important sites for mountain biodiversity;
- 15.4.2 Mountain Green Cover Index.

Formula

$$Cost = Population * \frac{\alpha (1 + GDP_{deflator})}{EXR}$$

α – the gap in biodiversity expenditure per capita in Egypt in base year, between the expenditure needed and the expenditure under a business-as-usual scenario.

EXR – EGP/USD exchange rate

$GDP_{deflator}$ – GDP deflator

Justification and data sources

In its 2019 report, the Brookings Institute estimated the required public spending for preserving biodiversity was \$6 per capita in 2015 prices for lower-middle-income countries.²⁷ To estimate the additional public spending required, the \$6 was converted into EGP and projected over time using inflation as estimated by the UN DESA World Economic Forecasting Model (WEFM) and expected population growth.

²⁷ Kharas, H. and J. McArthur, 2019.

SDG 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

Targets and indicators

Target 17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships in data, monitoring and accountability.

- Indicator 17.17.1 Amount in United States dollars committed to public-private partnerships for infrastructure.

Formula

$$Cost = \frac{\gamma(E_{airport} + E_{tgt.ports} - Exp_{BaU.ports} + Exp_{tgt.roads} - Exp_{BaU.roads}) * (1 + infl)}{EXR}$$

E – expenditures on given category in constant 2015 USD (Global Infrastructure Outlook)

EXR – exchange rate

γ – initial exchange rate

$infl$ – inflation rate

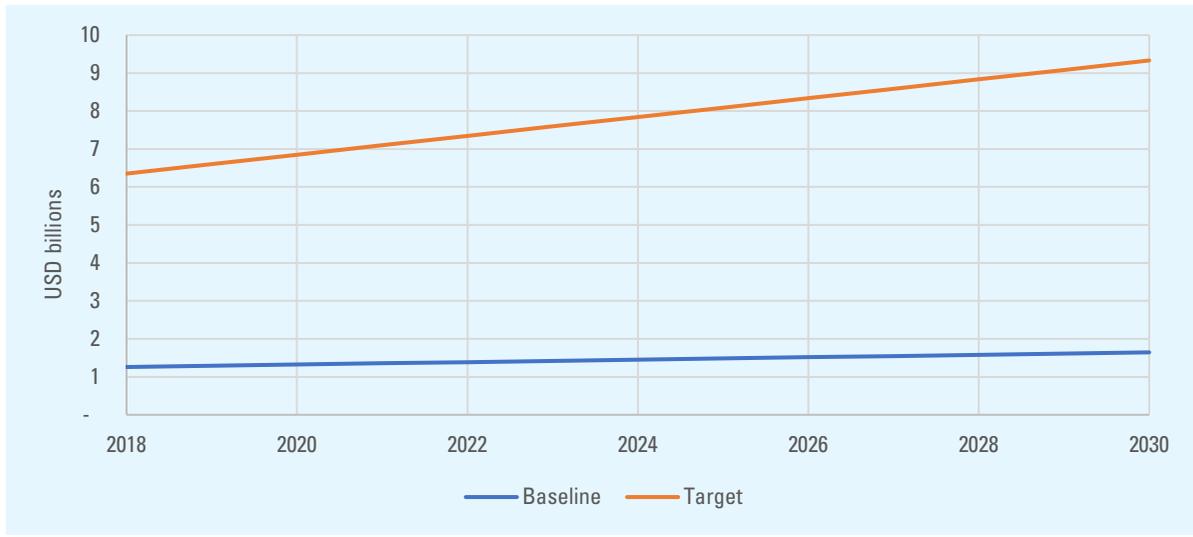
Justification and data sources

The Global Infrastructure Outlook²⁸ forecasts the investment requirements to meet the United Nations Sustainable Development Goals for universal access to infrastructure. The financing gap is estimated by the difference between two scenarios: (i) current trend, in which countries continue to invest in line with current estimates and (ii) a policy scenario, where investments match those of the best performing peers to meet the SDGs, adjusted for the characteristics of that country and its infrastructure quality.

The Global Infrastructure Outlook estimates the additional investment needed in airports, ports and roads for Egypt in order to reach a certain per capita infrastructure stock. Figure 11 depicts the difference in investment in infrastructure between business-as-usual and policy scenarios.

²⁸ The Global Infrastructure Hub Ltd., Global Infrastructure Outlook, Australia.

Figure 11. Investment in infrastructure (USD, constant prices (2015))



Source: ESCWA calculations based on the Global Infrastructure Outlook estimates.

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