


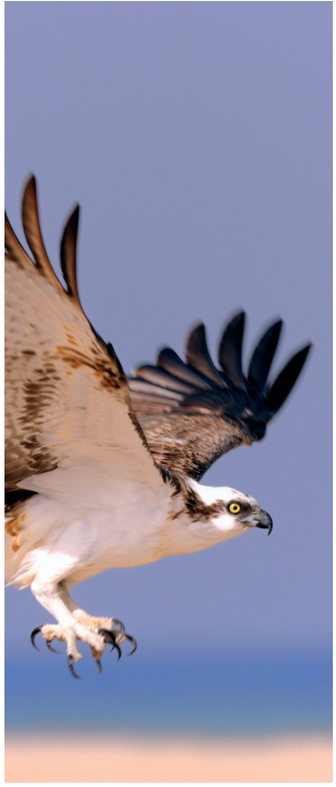


# State of the Environment 2017

## Arab Republic of Egypt

### Summary for Policymakers

Ministry of Environment

Arab Republic of Egypt

In the Name of God

the Most Gracious the Most Merciful

Ministry of Environment

Arab Republic of Egypt

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**Production:**

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**Cover photos:**

Rice straw: Richard McGovern 2011
Nile River in Aswan: Reference.com 2018
Plastic collection in "Wadi El Gemal": Mohamed Sobhi 2017
Ospery in flight Sinai Egypt: Yehia Al Alaili 2010
Egypt from space: NASA Marshall Space 2010

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## Assessment of Egypt's State of the Environment 2017

Egypt' State of the Environment Report 2017 is an integrated assessment of the Egyptian environment and a comprehensive programme involving extensive participation of ministries, agencies, the civil society, academia, women and youth for conducting a comprehensive and scientifically credible assessment to support decision-making processes at the environmental, economic and social levels.

The State of the Environment Report 2017 differs from previous reports in that it focuses on the globally and regionally agreed targets such as the 2030 Sustainable Development Goals and the 2063 Africa Development Strategy to make Africa a prosperous and healthy continent, and an influential power on the international scene along with the national agenda of Egypt's "Vision 2030" and the Egyptian Sustainable Development Strategy (Figure 1).

Documented and sequential data on the state of the environment are of the most important factors for good decision-making. Therefore, the Integrated Environmental Assessment relies on collaboration with all ministries and agencies for collecting and documenting data during the assessment process. Hence, the DPSIR methodology (Driving forces - Pressures - Status - Impact – Response) was adopted. Therefore, the 2017 assessment identifies the following priority environmental issues:

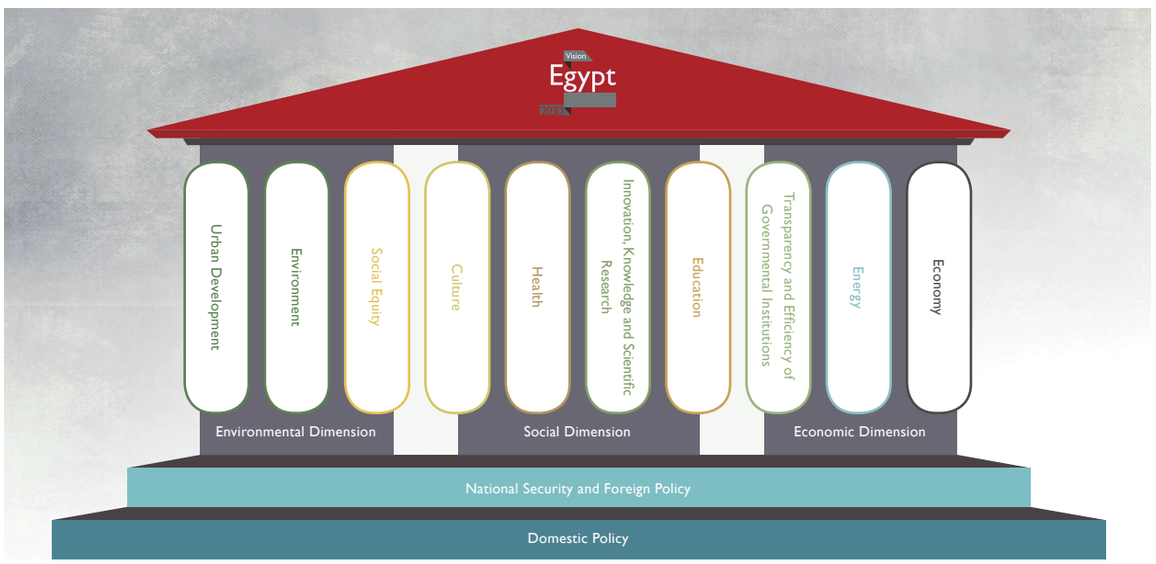
«Air and energy quality and its impact on the environment, water quality affecting the lives and health of Egyptians, waste management, ecosystems balance, biodiversity and climate change as a cross-cutting issue with the essential environmental elements and hence Egypt's relationship with its regional and international neighbors and its contribution to achieving the Sustainable Development Goals (SDGs)».

The assessment analyzes existing environmental policy responses in terms of their impacts and effectiveness, identifies potential gaps, analyzes the challenges of implementing these policies in the light of their mandated objectives, and identifies the mechanisms that may contribute positively or negatively to changing the state of the environment in Egypt.

This Summary for Policymakers highlights the findings of the Egypt State of the Environment Report 2017, which holds the vision of preserving the environment for human health and well-being.



Figure (1): Dimensions of Egypt's Vision 2030




**Source:** Ministry of Planning, Monitoring and Administrative Reform 2016

## 1. Introduction

Environmental changes on the planet bear a negative impact on lifestyle. The efforts exerted to reduce or slow the rate of change are weak and disproportionate to the pace and rates of change. Global environmental programmes and environmental agencies have launched an appeal to improve environmental performance and develop sustainable development frameworks that preserve this planet. Egypt was a pioneer by adopting "Vision 2030" to secure a competitive, balanced and diversified economy with a balanced ecosystem for achieving sustainable development and advancing the quality of life for Egyptians.

Many countries have begun to change their development policies by adopting environmental conservation and sustainable development systems as pillars of their development strategies. In this context, the Sustainable Development Strategy in Egypt represents an essential step in the process of comprehensive development, in order to achieve economic and social prosperity together with environmental sustainability. The framework of the general policy has been strengthened to achieve this goal through the establishment of sustainable development units and task forces in various ministries and agencies to coordinate and monitor developing and implementation of sustainable development plans and strategies led by the Ministry of Planning, Monitoring and Administrative Reform. The integration of environmental dimensions in all sectors, whether economic or social, is one of the most important factors in achieving sustainable development. This is because the inter-sectoral integration to achieve rational consumption of available natural resources is the most important approach of sustainable development, which ensures the developmental sectors' ability to grow within the framework of the availability of natural resources in terms of quantity and quality. Hence, the environmental dimension becomes a central pivot in all economic development sectors to achieve the security of natural resources and support their optimal exploitation and investing in them to ensure the rights of future generations.

There are many challenges on the ground which face environmental action and the achievement of sustainable development. In 2017, the Ministry of Environment faced a number of environmental issues that directly affect citizens' lives, especially air quality and water conservation of the Nile River. The Ministry also attached special importance to the waste file that haunts the Egyptian people, in addition to regional and international challenges to confront the impacts of climate change.

Despite all these challenges, Egypt has taken steady steps in terms of economic, legislative and institutional aspects that ensure the achievement of sustainable development goals at the local level, which are consistent with international and regional goals, in order to strengthen the institutional and legislative structure of the natural resources management system in the country, to reduce waste in using those resources. Egypt's "Vision 2030" sets out four strategic objectives for implementing environmental policies with a view to achieving sustainable development. The most important of these steps include, but are not limited to, the development of environmental monitoring systems and networks, the calculation of environmental indicators for air or waterways, the development of systems to assess the environmental impact of development projects, and the development of law enforcement systems to deal with all types of chemicals and hazardous substances and wastes according to international standards, etc.

The Egyptian State through the Ministry of Environment has developed clear and feasible policies to achieve sustainable development, preserve the environment and face the effects of climate change, based on the Sustainable Development Strategy and Egypt's "Vision 2030". This aims at enabling Egypt to be an active partner in the international environment which is characterized by dynamic and successive sustainable developments, as well as on Africa's Sustainable Development Strategy 2063 and in line with the UN Sustainable Development Goals 2030. The main priorities of these policies are:

- Integration of the environmental considerations into strategic plans.
- Activation of the principles of partnership with all governmental and non-governmental bodies, the private sector and scientific research in achieving the State's objectives in sustainable development.
- Sustainable consumption and production.
- Contribution to the transformation to green economy.
- Development of plans and strategies to address climate change.

In order to activate women's important and effective role in society, especially in environmental management, the Ministry of Environment carried out programmes to raise women awareness and transfer expertise and information throughout the Republic in rural, urban

and nomadic communities, while encouraging projects and initiatives that could be implemented to achieve Egypt's national goals and international commitments in the fields of environment and sustainable development.

The State of the Environment Report 2017 identifies the most important environmental challenges and trends in Egypt, as well as investment opportunities in the environmental field, in particular the activation of environmental policies that lead to a fruitful link between environment and development for the welfare of the Egyptian citizen. The report also illustrates the use of modern sciences and technologies in the environmental field, the formulation of policies that support economic diversification to allow the integration of the environmental dimension in national development plans, and the adoption of the green economy approach to the optimal use of resources.

## 2. Air Quality

The ambient air is the intrinsic inheritance of every organism on the planet and is so important that it imposes on everyone the responsibility of protecting it from pollution and making it a clear approach to overcome any obstacles to its preservation. Air pollution threatens a large number of cities in Egypt as well as around the world.

Air pollution is one of the most alarming problems facing the Egyptian government. This made it one of the top priorities in Egypt's "Vision 2030" for reducing air pollution to achieve the Eleventh Sustainable Development Goal of making cities and human settlements inclusive, safe, resilient and sustainable, especially objective 6 to reduce cities' negative environmental impact. The Egyptian government has also paid great attention to air quality, municipal waste management among others.

Through "Vision 2030", Egypt has developed a series of environmental programmes. The most important of these was the development of policies necessary to reduce air pollution, combat climate change and protect the environment. Reducing pollution is, as well, one of the strategic objectives of Egypt's "Vision 2030", in order to reduce the loads of air pollution and pollution resulting from untreated waste (Ministry of Planning, Monitoring and Administrative Reform 2016).

Limited funding for the implementation of plans to reduce air pollutants and the establishment of monitoring stations are among the most serious challenges to the Government's efforts in this regard, in particular the Government's goal of reducing total pollution from respirable suspended particulates by 50 per cent by 2030 (Ministry of Planning, Monitoring and Administrative Reform 2016). The multiplicity of entities responsible for implementing air pollution reduction plans is also a major obstacle at the administrative, institutional and operational levels. The African "Agenda 2063" 10-year implementation plan (2014 – 2023) has determined that by 2025, all cities in Africa will be in conformity with the World Health Organization (WHO) standards (African Union Commission, 2015).

There are many driving forces and pressures that directly cause air pollution in Egypt. The most important of these pressures are:

- A steady increase in population and poor population distribution: Egypt's population reached 94.8 million in 2017 (Central Agency for Public Mobilization and Statistics (CAPMAS), 2017), where the population growth rate increased by 2.56 percent during 2006-2017.
- The geographical nature of Egypt and its impact on air pollution: as a result of Egypt's geographical position in the northeast corner of the African continent affected by the surrounding desert areas of high temperatures and frequent sandstorms and suspended particles in the atmosphere.

**Source:** Arjun Purkayastha 2009

- Lack of urban planning that takes into account the principles of sustainability over the past years and decades, which led to the overlap of various activities and their impact on the quality of the environment, especially air. The government issued the Environment Protection Law No. 4 of 1994 amended by Law No. 9 of 2009 and its executive regulations, which determine air pollutants, their sources and the impact of exposure to ambient air and the limits permissible to allow for monitoring and follow-up.

Egypt has taken measures to activate the air quality improvement system through the establishment of a monitoring network and the preparation of early warning and forecasting systems. The number of installed and operated stations in the monitoring network reached 93 stations distributed throughout the Republic. This network contributes to the daily mapping of air concentration levels of pollutants, and consequently the development of prediction systems.

Table (1): Classification and Distribution of the National Network's Stations Monitoring Ambient Air

| Station Type | Greater Cairo | Alexandria | Delta | Upper Egypt | Sinai and Canal cities | Total |
|---|---|---|---|---|---|---|
| Industrial | 8 | 3 | 4 | 3 | 1 | 19 |
| Urban and residential | 15 | 4 | 8 | 9 | 2 | 38 |
| Traffic | 9 | - | - | 1 | - | 10 |
| Reference areas | - | - | - | - | 2 | 2 |
| Mixed Nature Areas | 16 | 1 | 2 | 3 | - | 22 |
| Two mobile stations | 2 | - | - | - | - | 2 |
| Total | 50 | 8 | 14 | 16 | 5 | 93 |

**Source:** Ministry of Environment 2017

Egypt's Vision 2030 set out environmental performance indicators that set the number of the National Monitoring Network stations to reach 120 by 2030, in addition to increasing the number of monitoring sites for monitoring industrial emissions to 500 by 2030.

Emphasis has been placed on reducing total pollution through the implementation of three industrial pollution control programmes. The second phase, which lasted from 2007 to 2017, was completed. During that phase 36 environmental projects were implemented in 27 industrial facilities in Greater Cairo and Alexandria. They participated in reducing the pollution rate by 47.8 tons / day of respirable suspended particles, 21.5 tons / day of sulfur dioxide and 149 tons / day of carbon monoxide.

Greater Cairo and many Delta governorates are exposed to high concentrations of pollutants in the air during the autumn of each year, as a direct result of rice straw fires from about 1.8 million feddans in Delta governorates, which contribute 42 percent of this phenomenon, in addition to open burning of municipal waste, industrial activities and vehicle exhaust.

As part of Egypt's response to this phenomenon, the Ministry of Environment signed protocols with the Ministry of Agriculture to collect and press 350 thousand tons of rice straw and to recycle 220 thousand tons thereof in addition to the continuation of a cooperation protocol with one of the cement companies to use rice straw as an alternative energy source.

The Ministry of Environment has also developed a strategy to confront the black cloud phenomenon by encouraging investment in the utilization of agricultural waste, especially rice straw through the provision of financial support, as well as machinery and equipment for recycling projects, within the overall strategy for the disposal of agricultural waste at the level of the Republic.


Rice straw pressing model and recycling processes to reduce the black cloud



In addition, a plan for the development of charcoal stackers using environmentally sustainable technology will be developed by providing free technical support to the developed models. Four upgraded models of charcoal kilns have been adopted and are environmentally compliant according to the environmental requirements and controls of the models developed for the production of charcoal.

Through periodical monitoring and enforcement of laws and regulations, it was found that sulfur dioxide, nitrogen dioxide and carbon monoxide air pollution loads are within permissible limits. However, the annual average level of suspended particles PM10 and PM25 exceed the allowable limit; whereas, on a daily basis, there is compatibility of about 70 per cent throughout the days of the year.


Coal coils and transformation and development model

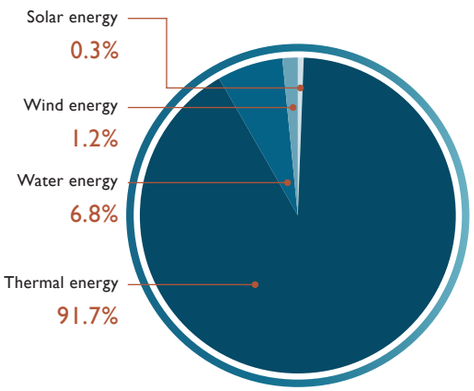

Source: Richard McGovern 2011

## 3. Energy:

Energy is one of the most important challenges facing the Egyptian state, especially as it relies on traditional energy sources such as oil and natural gas by about 95 per cent. Egypt seeks to reduce its dependence on these sources and replace them with clean and renewable energy such as solar and wind energy.

Energy is increasingly needed to meet development needs. Seventy per cent of all energy is consumed by domestic and industrial activities combined. In 2017, power output reached about 188.6 billion KWh, which was produced from four sectors as shown in Figure (2).

Figure (2): Percentage of energy sources 2016/2017




**Source:** Ministry of Planning, Monitoring and Administrative Reform 2017

Egypt is currently adopting energy conservation policies and expanding renewable energy to reduce climate change emissions in pursuit of Sustainable Development Goal 7, to ensure access to affordable, reliable, sustainable and modern energy for all. Particular emphasis is laid on the goals ensuring access to affordable, reliable and modern energy services for all by 2030 (7.1), increasing the share of renewable energy in the global energy mix (7.2) and doubling the energy efficiency improvement rate by 2030 (7.3) (UNGA 2017).

To implement this goal at the national level, "Vision 2030" included the establishment of a sustainable energy system based on securing affordable, reliable, sustainable and modern energy for all (Ministry of Planning, Monitoring and Administrative Reform, 2016). By 2050, the Middle East and North Africa Energy Policy Reform Plan aims to reduce climate change by limiting global warming to no more than 2°C.

This National Vision is in line with the African "Agenda 2063", which states that the African continent aspires to harness all African energy resources to ensure that renewable, modern, efficient, low-cost and environmentally friendly sources of energy are available to all African households, businesses, industries and institutions through building national and regional energy pools and networks by 2063 (African Union Commission, 2015).

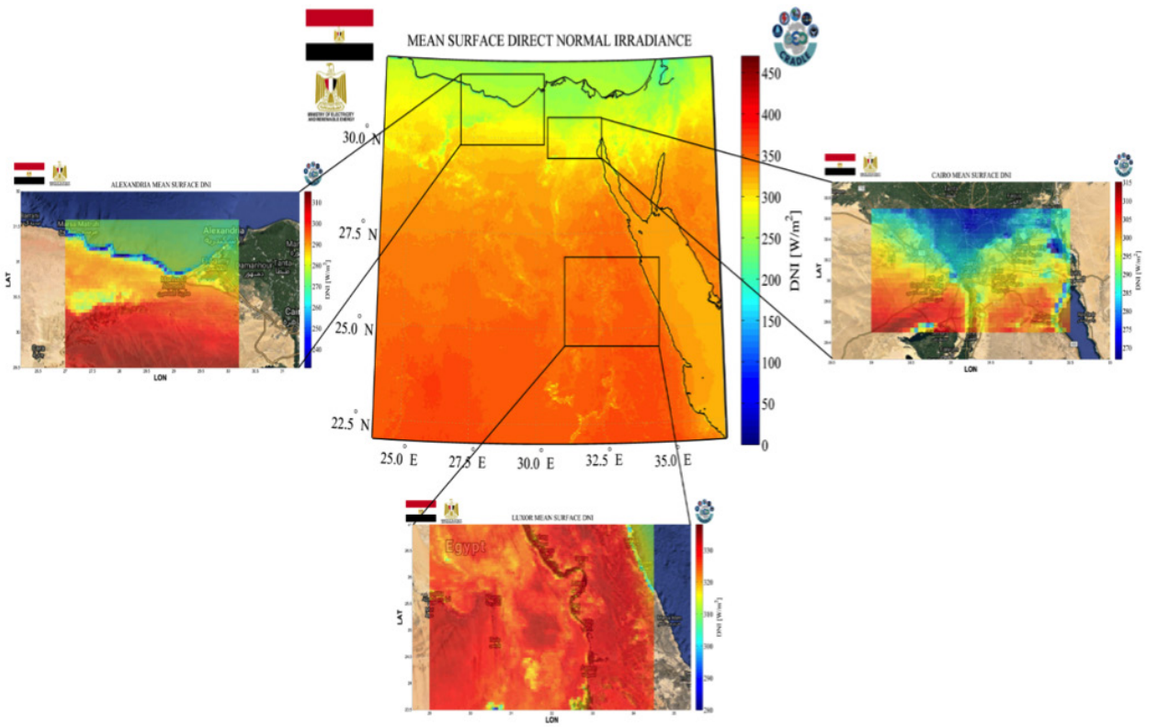
Within the framework of renewable energy and adaptation initiatives, preparations were made for two initiatives in 2017, one on renewable energy in Africa and the other on mobilizing international support for adaptation activities in Africa. Egypt will receive 49.5 per cent of the funding for solar projects and 53 per cent for its wind energy projects, as announced by France, through the Africa Renewable Energy Initiative. Egypt is also activating the work of the National Council for Climate Change which aims to integrate national efforts to implement plans to reduce greenhouse gas emissions, update adaptation strategies to the adverse effects of climate change, and ratify the Paris Agreement on Climate Change (Ministry of Environment, 2017).

Egypt needs sustainable long-term planning for energy sector investments at the national level to expand current capacity to produce electricity and meet future growing demand, and to take advantage of the country's favorable conditions for large-scale renewable energy production. These measures to reduce fuel consumption which focus on energy efficiency and conservation and generating energy from renewable sources such as solar energy contribute to building a more resilient economy and society in Egypt capable to adapt to climate change (Ministry of Planning, Monitoring and Administrative Reform, 2018).

Figure (3) shows an example of Solar Atlas, where solar brightness rates are estimated and can generate solar energy.

The state continues to implement the energy conservation policy by involving the community in the implementation of renewable energy small-scale projects, and disseminating a clean energy culture such as the project «Think of the Environment» to mount a solar power plant with a capacity of 5 kW which is enough to illuminate a school. In addition, solar energy cells are installed to illuminate a number of streets or rooftops are used in generating solar energy, with the development and implementation of training programmes for students and teachers in schools to spread the culture of new and renewable clean energy applications.

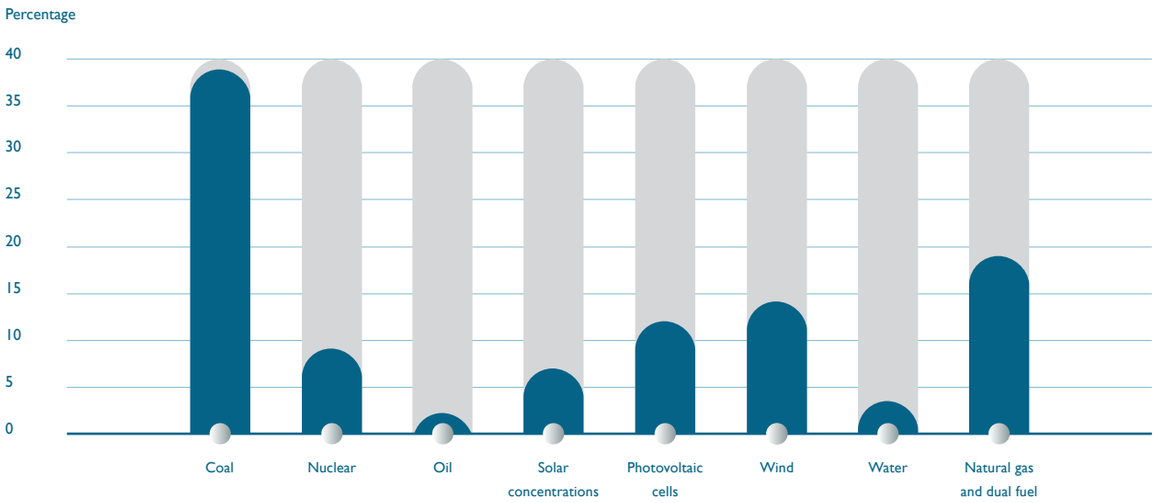
Figure (3): A map showing surface solar radiation levels and potential use of Egypt's Solar Atlas




**Source:** New and Renewable Energy Authority 2018

Egypt's future Energy plan 2035 aims to increase new and renewable energy contribution to the needs of Egypt to reach about 37.2 per cent as shown in Figure (4).

**Figure (4): Graph of the contribution of renewable energy till 2035**




**Source:** New and Renewable Energy Authority 2018



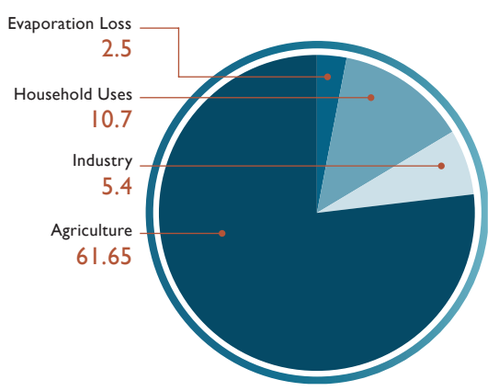

Winds of Gabal Zeit

## 4. Water Resources

Freshwater resources are among the most important natural resources. Given Egypt's geographical location in the arid and water scarcity zone, water resources' management and conservation is a national task and one of the most important priorities of the Egyptian State. Environmental laws and executive regulations establish policies and legislation to conserve the Nile waters. Despite all these legislations and policies, there are some challenges to water resulting from population growth and the increasing pollution rates in the irrigation and drainage network, which directly or indirectly affect the Nile water as a main water resource.

The total annual water use in Egypt in 2017 was estimated at 80.25 billion cubic meters. These needs are distributed among different sectors as shown in Figure (5). It is clear that Egypt has a deficit in renewable water resources estimated at 23.45 billion cubic meters annually. Therefore, Egypt resorts to compensate this deficit from non-renewable groundwater, reusing agricultural drainage and sanitation waters, and desalinating sea water. Given the internationally known water poverty limit of 1,000 cubic meters per capita to achieve self-sufficiency in various uses (drinking, agriculture, industry), and considering the population of about 92 million people, this means that Egypt's actual water needs is estimated at 92 billion cubic meters annually which should increase by increasing rate of the population. This confirms that Egypt suffers water scarcity and that it needs to utilize, recycle and reuse every drop of water.

Figure (5): Classification of Egypt's water needs 2017 (80.25 billion cubic meters/year)




Source: CAPMAS 2017

Egypt's renewable freshwater resources per capita in 2017 reached about 600 cubic meters per year, which falls into the scope of water scarcity or water poverty countries (CAPMAS, 2017). On the other hand, non-conventional water resources accounted for only about 20 percent of Egypt's total water resources in 2015 / 2016 (CAPMAS, 2017). The phenomenon of climate change is expected to affect the water sector. The demand for water will increase especially in the agricultural sector. This is in addition to the impact of sea level rise on groundwater reservoirs in the Nile Delta areas, which increases their salinity and consequently affects their uses.

One of the most important challenges facing the Egyptian environmental policy is the waste of water use. The lack of rationalization of water consumption in all consuming sectors, especially in the sectors of agriculture, industry and housing, poses a major threat to the country's water resources and a threat to its water security. On the other hand, with the expected increase in demand for water use due to population increase and the potential impact of climate change with Egypt's fixed share of the Nile water, efforts to rationalize water consumption and search for other non-traditional sources become a national necessity (Ministry of Planning, Monitoring and Administrative Reform, 2015).

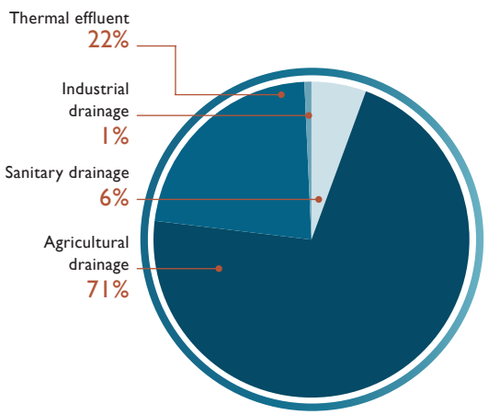
Overexploitation of the aquifer also poses a threat to water security by putting pressure on non-renewable water resources without replacing them, despite the paramount importance of groundwater as a strategic reservoir. The deterioration of the state of the canals and drains networks poses a major threat to the water resources in Egypt. Canals and drains networks need to be re-renewed and require serious attention due to the spread of infringements on them, whether by making illegal irrigation connections or dumping of sewage and industrial waste in them, which led to contamination of their water and the spread of water shortage at the ends of the canals. Such violations generally affect the efficiency of water resources use (Ministry of Planning, Monitoring and Administrative Reform, 2015).

The high cost of introducing and using modern technologies for desalination or water treatment is also a challenge to maximize the use of non-conventional water resources, which must be increased to reduce the load on fresh water resources and to meet the increasing demand (Ministry of Planning, Monitoring and Administrative Reform, 2015). In addition, the existing water transmission lines, which lead to the waste of large quantities of fresh water or treated wastewater, are being worn out, affecting the demand for water resources over the real demand due to the water lost during the transport process (Ministry of Planning, Monitoring and Administrative Reform, 2015).

In order to protect freshwater and the Nile from various sources of pollution, the state has established a network to monitor pollutants that flow into the Nile. Various sources pollute fresh water and directly affect the Nile water which is used for drinking, irrigation, or in lakes that are a source of fish wealth. Sewage, which is one of the most serious sources which pollute waterways, amounts to 1.06 billion cubic meters, of which 50 per cent is treated and the rest is discharged directly into the waterways. Agricultural drainage is also one of the most serious pollution sources which affects the Nile River. About 72 agricultural drainage canals flow into the Nile loaded with pesticides and chemicals, in addition to direct random drainage from villages deprived of sanitation.

The industrial drainage of industrial establishments contributes as little as 1 percent of the total direct drainage on the Nile River (Figure 6), which results from 9 industrial establishments. Although it is a small percentage, its impact is high due to the contained liquids and chemical compounds that harm the aquatic environment and have a negative impact on the quality of drinking water. The thermal effluent used for cooling purposes inside power plants directly affects the aquatic environment due to the high temperature of the water, the quantity of which is estimated at 4.2 billion cubic meters. Egypt has suspended some industrial establishments until their environmental conditions are adjusted. Legal and technical measures are being taken to reconcile the environmental conditions of the other establishments. These environmental measures resulted in diverting 78 per cent of industrial wastewater from the Nile.

Figure (6): Total direct drainage to the Nile in 2017




**Source:** CAPMAS 2017


One of the sources of direct drainage in the Nile

The Ministry of Housing and Utilities has increased the design capacity of the treatment plants by more than six-fold. The current design capacity of the treatment plants is about 6 million cubic meters / day to serve 18 million citizens in urban areas, within the framework of the policies adopted by Egypt to control indirect sewage on the Nile River.

The Ministry of Environment has also issued guidelines for the technical, environmental and health standards and requirements for fisheries' projects as follows:

- Guidelines to Fisheries Projects.
- Guidelines to fisheries projects for aquaculture systems.
- Guidelines to fisheries projects for aquaculture using marine cages.
- Guidelines to best practices in the management of fisheries projects.
- Guidelines to the fisheries projects for fish farming in cages in the semi-saline area between the Qanatir Edfina and Bogaz Rashid and determining the capacity of this area.
- Issuance of the appropriate water quality standards for aquaculture in semi-saline areas.

These efforts are in line with the sixth Sustainable Development Goal (SDG), which is to ensure the availability and sustainable management of water and sanitation for all. The provision of safe drinking water to all citizens is one of the most important purposes of SDG 6. The proportion of households with access to safe drinking water is 98 per cent in urban areas and 95 per cent in rural areas. However, in order to achieve 100 per cent by 2030, the Government is expanding the implementation of drinking water projects and is currently implementing 236 projects, and another 155 are being developed to cover 498 villages (Ministry of Planning, Monitoring and Administrative Reform, 2018).

These efforts are also in line with the African "Agenda 2063", which states that by 2063, African countries will be among the best performers in the global quality of life standards and human well-being, through inclusive growth strategies and the provision of basic services, most importantly water. This will be done through the use and management of water in an equitable and sustainable manner for social and economic development, conservation of the environment and support for regional cooperation (African Union Commission, 2015).

For all the above, environmental development programmes up to 2030 included a number of programmes and projects that underpin the 2030 Strategy during the period 2016-2030, such as:

1. Strengthening the institutional and legislative structure of the water resources management system:

   This programme aims to rectify the institutional and legislative imbalances in the water resources management system in the country by redefining the roles of the governing bodies of the sector and raising its administrative efficiency in addition to drafting the necessary legislations. The drafting of such legislation is intended to be completed by 2020. This is a relatively low-cost programme.

2. Expanding the establishment and development of the infrastructure necessary for achieving the sustainability of the water system:

   This programme aims to develop existing infrastructure and expand key infrastructure projects in the future to increase reliance on non-conventional water resources and reduce waste in existing systems. The programme is intended to be completed by 2025 and is considered one of the relatively high-cost programmes.

3. Implement fiscal policy reforms and use economic instruments to move towards more sustainable consumption patterns of water and natural resources:

   This programme aims to reduce the water demand gap by developing policies that support water conservation practices and reviewing virtual water policies in international trade. It is intended to start this programme in 2020 and finish it by 2025. This programme is a relatively medium-cost programme (Ministry of Planning, Monitoring and Administrative Reform, 2018).

In the context of Egypt's endeavor to develop water resources and improve water quality, there was a

need to adopt integrated and sustainable methods in dealing with water resources, foremost among which are:

- Utilize modern and traditional techniques and methods for the effective management of water resources.
- Use of modern technologies in water desalination by renewable energy.
- The need to focus on developing the capacities of the bodies concerned with water management and raising their efficiency in training individuals and the awareness efforts in reducing water consumption practices.
- Concerted efforts by specialized agencies, research centers, NGOs and the private sector to develop programmes related to water resources management, with providing the necessary financial resources.
- Protect surface and ground water from various pollution sources.
- Develop water resource assessment systems for all consumers, focusing on the economic aspects of water production and distribution as the focal point of which water policies are made.
- Establish a mechanism to support scientific and applied research materially, especially with regard to water resources, with the need for the participation of the industrial sector in the support process.
- Activate the application of legal procedures related to water resources in order to ensure their sustainability.
- Revise water policies with a major focus on water management, drought preparedness and mitigation, as well as reviewing water regulatory frameworks by introducing measures to combat water waste and pollution.
- Raise water use efficiency, and consider the possibility of recovering the costs of irrigation services, such as operating and maintenance costs to improve water conservation.
- Encourage the use of non-conventional water sources and support research in the safe reuse of treated and brackish water, with due attention to agriculture, to increase water use efficiency and crop management, and to develop salinity and drought-tolerant crop varieties.

The Ministry of Environment has worked to reduce pollution loads and support water quality monitoring efforts. It has reduced the number of facilities with direct drainage on the Nile River, which has reduced the total organic loads of direct industrial drainage on the Nile River.

With regard to supporting water quality monitoring efforts, the shift has been made from traditional monitoring methods to the latest global technologies for instant and continuous monitoring of industrial and sanitary drainage of facilities which discharge on the Nile River. This contributes to realizing tight control and avoiding human error during the inspection works of these facilities. A number of new continuous monitoring stations were mounted and operated on installations with high pollution loads on the Nile River in addition to the installation of some stations on the course of the Nile River nearby drinking water intakes in each governorate.

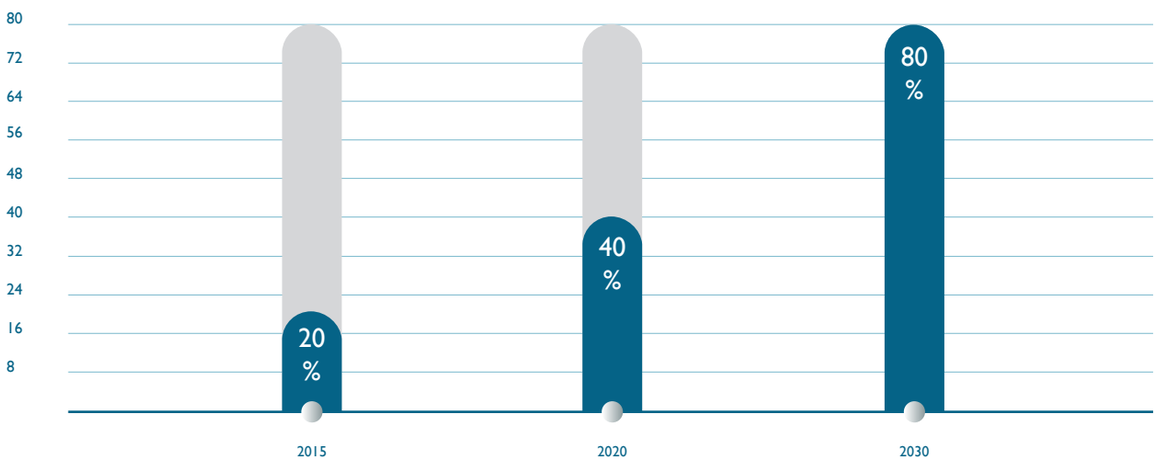
In order to ensure continuous monitoring of water quality, a periodic programme has been implemented to monitor the quality of water and sediments in 9 lakes (Manzala, Mariout, Idku, Burullus, Bardawil, Qaroun, Al-Rayyan, Al-Murrah, and Al Timsaah). The Programme aims to assess the environmental status of each lake, and update the data and make it available to decision makers of the Ministries of Agriculture, Water Resources, Irrigation, Health, Housing and Public Utilities to take the necessary measures to improve the environmental status of these lakes. The Monitoring programmes measure the power of hydrogen pH, dissolved oxygen DO, absorbed biological oxygen BOD, total solids TS, COD, NO3, ammonia, phosphate, bacterial counting and heavy metals. They also prepare and publish periodic reports on the status of water quality and consequently the State takes measures and policies to respond to crises and reduce pollution. Extensive environmental monitoring and campaigns have also been carried out on facilities which drain directly or indirectly on the Nile, including industrial facilities, power plants and sewage treatment plants.

## 5. Integrated Waste Management

The issue of waste spread is a chronic environmental challenge in the Arab Republic of Egypt. Due attention is paid by the State and the Ministry of Environment to this problem. The government has developed a programme for developing waste management systems aiming at raising the efficiency of waste collection and transport to 80 percent and recycling efficiency to 25 percent based upon statistics and studies on population numbers and daily waste percentages. The Sustainable Development Strategy and "Egypt's Vision 2030" identified pollution reduction and integrated waste management as a strategic objective to reduce air pollution loads and reduce pollution from untreated wastes with their serious environmental and health impacts while maximizing the utilization of natural resources by exploiting solid waste with a focus on municipal solid waste. This is important for achieving the twelfth Sustainable Development Goal of ensuring sustainable consumption and production patterns to achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with the agreed international frameworks, and significantly reducing their release into air, water and soil in order to minimize their adverse effects on human health and the environment.

To achieve the sustainable development strategy to increase the proportion of regularly collected and properly managed solid and municipal waste to 80 per cent by 2030 (Figure 7). According to the first 10-year implementation plan 2014-2023 of the African "Agenda 2063" , nine out of ten persons will have access to safe drinking water and urban recycling services for at least 50 per cent of the waste they generate (African Union Commission, 2015).

Figure (7): Percentage of solid waste collected and planned to be collected and managed appropriately




**Source:** Ministry of Planning and Administrative Reform 2015

This includes a strategy to develop the legislative principles and laws with the elaboration of detailed plans for the executive bodies, and raise the efficiency and training of their staff with advanced programmes to raise the awareness in support of implementation.

The main themes of this strategy are:

- Establishment of a new waste management system.
- Involvement of civil society in integrated waste management.

- Establishment of a system to develop and implement rapid implementation plans for the most hazardous and degraded areas and control random dumps.
- Develop and implement field initiatives across governorates and support these governorates for garbage disposal and recycling.

The legislative and institutional framework of the waste management system has been developed, together with restructuring the solid waste management system and plans for 22 governorates (Ministry of Environment, 2017).

It also implemented the urgent plan to lift the historical accumulations of garbage in Alexandria, and supported the initiatives of the cleaning system in the governorates of Port Said and Ismailia, in addition to controlling the main landfills surrounding Cairo to reduce self-ignition of waste in these dumps. A system for agricultural waste has also been developed, in addition to a project to protect human health and the environment from unintentional emissions of persistent organic pollutants (POPs) and to deal with medical and electronic wastes, in the general framework for the management of industrial hazardous wastes as well as the utilization of such wastes as an important resource in coordination with the relevant ministries.

Persistent organic pollutants were dealt with through the implementation of the project of safe disposal of 2000 tons of such pollutants, as well as the safe disposal of 220 tons of expired Lindane through refilling and exporting for disposal by combustion outside the country, in addition to the inventory and classification of pesticides in 40 sites throughout the country.

Due to the steady increase in the use of plastic bags, the risk of non-recycling and the long time needed for decomposition, which may reach 100 years, Egypt has adopted a national initiative to reduce the use of plastic bags, to inventory the largest consumers and provide alternatives to plastic bags. This initiative is a new addition to the green initiatives that aim to promote sustainable development, effect the transform to the green economy and integrate sustainable production and consumption policies into the plans and programmes of Egypt.

In view of the national responsibility towards the establishment of an integrated and sustainable waste management system, there is a need to combine all efforts towards creating the appropriate environment for the establishment of this system through the adoption of a number of policies and approaches that will support the system and pave the way for the success of an effective and sustainable system, as follows:

- Improve the legislative environment for waste management by initiating the new waste law.
- Effective participation of NGOs and the private sector to support sustainable production and consumption and minimize waste generation.
- Participation of international organizations in providing funding for waste management projects.
- Provide financing mechanisms and incentives to encourage the private sector to invest in various areas of waste.
- Provide a clear, specific and secure contractual framework for the private sector, with contracts covering a long period of time so that private sector operators can improve the services provided.
- Continue the work to integrate the informal private sector into the waste management system through the establishment of equitable regulatory mechanisms for the integration of the formal and informal private sector, and the government sector into one integrated system.
- Integrate youth into the waste management system by providing technical and financial support to entrepreneurs in the waste sector.
- Support cooperation with regional and international organizations and developed countries in the field of waste management to benefit from the experiences of those countries and organizations and transfer advanced technologies in this field as appropriate to the Egyptian case.
- Encourage projects to use «rejects» as alternative fuel in various industrial activities.
- Tighten the environmental control and inspection systems in the waste management system in the different establishments, especially those that generate hazardous waste.
- Support and build the capacity of civil society organizations to participate effectively in the waste management system.
- Create new areas for investment in the fields of waste collection and management, such as manufacturing equipment for the collection, transportation and recycling of waste.

## 6. Biodiversity

Biodiversity in Egypt is of global importance despite the country's position within the desert and arid regions. The Egyptian territory is rich in intense biological diversity, which includes more than 2,145 species of wild plants (60 of which are indigenous), 175 species of algae, 110 species of mammals, 9 species of amphibians, more than 1,000 fish species, approximately 800 species of mollusks, more than 1,000 species of crustaceans, more than 325 species of coral reefs, and 10,000 to 15,000 species of insects (including 63 species of butterflies) as well as thousands of algae, bacteria and viruses. In addition, 1775 species of plants were recorded in the following areas: 279 species in North Sinai, 472 species in South Sinai, 328 species in the North Coast, 66 species in Halayeb region, 250 species in the Western Desert and 280 species in the Eastern Desert.

Egypt has a wide variety of ecosystems and aquatic and wildlife. Its many flora and fauna represent both tropical and Mediterranean environments, some of which go back to millions of years ago. Egypt is one of the leading countries in the protection of biodiversity and has demonstrated this by acceding to international conventions that promote this trend, especially the Convention on Biological Diversity in 1992. Egypt was one of the first countries to prepare and implement a national biodiversity strategy and action plan over a period of 20 years (1997-2017) with governmental, national and popular participation. In 2014, Egypt declared 30 natural reserves covering more than 149,000 square kilometers, equivalent to about 14.7 per cent of the country's total area, 13 of these areas have approved and effective management plans.

It was therefore a strategic environmental objective until 2030 to maintain ecosystems' balance, biodiversity and rational and sustainable management. This goal includes the protection of Egypt's outstanding biodiversity and raising the efficiency of its management through natural reserves, ensuring biodiversity's continuity and sustainability. These efforts face the following three main problems:

1. Lack of funding for monitoring biodiversity and management of reserves: this adversely affected biodiversity efforts, resulting in Egypt's lagging in this field compared to other countries.

2. Non-participation of civil society in efforts to protect biodiversity. Failure to expand the circle of beneficiaries and those interested in biodiversity protection efforts to include civil society leads to doubling the protection burden on Egypt and affects the efficiency of those efforts.

3. Lack of awareness of the importance of biodiversity and the need for sustainable management of biodiversity in development.

In response, the Government has established a number of projects to address these challenges, including:

1. Raising the efficiency of the infrastructure and management necessary to develop biodiversity protection efforts:

This programme aims to empower efforts to conserve ecosystems and biodiversity by developing their infrastructure and management. The programme is intended to start in 2020 and be completed by 2025 and is considered one of the relatively high cost programmes.

2. Increasing participation of the civic and private sector in biodiversity conservation and protection efforts:

This programme aims to reduce the financial and administrative burden of implementing biodiversity conservation programmes by engaging the private sector and strengthening community participation frameworks. The programme is intended to start in 2025 and be completed by 2027, and is considered one of the relatively medium-cost programmes.

The Ministry of Environment has also developed biodiversity conservation policies to support the path of sustainable development through:

- Reducing the negative impacts of different sectoral policies (land-use planning, transport, energy, uncontrolled urbanization, etc.) on priority elements of natural resources, in particular biodiversity, and implementing measures to correct these impacts through the development and implementation of land-use plans.
- Promoting the implementation of good fishing practices and sustainable harvesting in the Mediterranean Sea, the Red Sea, the lakes and the River Nile, in order to conserve fisheries and their habitats, restore and protect key biological resources, and develop fish farms in and around the Egyptian lakes.

- Developing and expanding the network of reserves' areas to include 17 per cent of total land and inland waters and at least 5 per cent of coastal and marine areas; and prioritizing sites of particular importance to biodiversity and key ecological processes and effective management of these reserves.
- Developing and implementing a unified Egyptian methodology for identifying and monitoring all the components of biological diversity in accordance with international standards to ensure the conservation or rehabilitation of 50 per cent of the most threatened species with a focus on mammals and reptiles.
- Developing and implementing national programmes for the protection and rehabilitation of endangered and indigenous species.
- Adapting to and minimizing the potential risks of climate change in Egypt, verifying priority setting, taking necessary measures and providing funding mechanisms to address and monitor all impacts of climate change on natural resources, coastal areas, biodiversity and ecosystem services.
- Consideration and implementation of measures and strategies to enhance the capacity of biodiversity to combat desertification at the local level.

These efforts are in line with Sustainable Development Goal 15 (SDG 15) which seeks "to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss". Efforts also coincide with SDG 14 which seeks to "conserve and sustainably use the oceans, seas and marine resources for sustainable development".

Egypt's plan to develop the existing network of protected areas and to proclaim other areas as natural reserves is the last resort to preserve biodiversity and protect living organisms and endangered species in Egypt. Egypt has developed a vision for the management and development of natural reserves through conservation and sustainable use of reserves, in a manner that preserves natural resources and develops the infrastructure of reserves. In addition, a number of sustainable economic activities have taken place in Wadi El-Gemal, El-Rayyan, Qaroun, Wadi Degla and the Petrified Forest reserves. Figure (8) illustrates one of the planning models of the Petrified Forest Reserve (Ministry of Environment, 2017).

At the legislative level, the draft law on natural reserves has been finalized and the Council of Ministers has approved the draft law regulating access to biological resources and the equitable sharing of benefits arising from their use. The Ministry of Environment also contributed to the preparation of a new draft law on biosafety of genetically modified products (Ministry of Environment, 2017).

Egypt also successfully secured the right to host the 14th meeting of the Conference of the Parties to the United Nations Convention on Biological Diversity and began preparations in 2017 to host the Conference from 13 to 29 November 2018 in Sharm El Sheikh as the first Arab and African country to host this event. The conference, which is one of the largest United Nations conferences on biodiversity, was under the theme "Investing in biodiversity for human health and well-being and protecting the planet". This will contribute to strengthening international cooperation to halt biodiversity degradation worldwide, in addition to achieving the objectives of the Convention.

Figure (8): Model of the Petrified Forest Reserve Development Plan


**Source:** Ministry of Environment 2017

## 7. Climate Change

Climate change is one of the most important issues intersecting with environmental issues and the axes of sustainable development. Egypt is one of the countries most threatened by the effects of climate change and this threat comes within its geographical framework. The African "Agenda 2063" identified the risks of climate change and natural disasters as one of the most serious threats to Africa's development, especially with the continent's limited capacity to adapt and deal with them (African Union Commission, 2015).

The Paris Agreement of the United Nations Framework Convention on Climate Change set the general framework for global, regional and national action to address the challenges and impacts of climate change. The agreement aims to strengthen implementation of the Convention on Climate Change by consolidating global action to address the threats of climate change in the context of sustainable development through three main pivots: keeping global average temperature rise below 2°C above pre-industrial levels; promoting the ability to adapt to the adverse effects of climate change in a way that does not threaten food production and facilitates financial flows for low-carbon technology applications. It also includes the provision of nationally defined contributions, including mitigation, adaptation, and means of national implementation, and updating them every five years.

Egypt is implementing these actions to address climate change adaptation and mitigation, and the need for the private and public sectors to work together to implement nationally defined contributions (text of Paris Agreement 2051 in Arabic).

The observed rise in temperatures during the past years poses a direct threat to the Egyptian land and environment and to important economic and vital activities such as agriculture, land reclamation, water resources, health, energy production, tourism, inter alia. Sea-level rise as a result of increased global warming is also considered to be one of the most serious negative impacts of climate change on Egypt because of its direct effect on coastal areas, especially low-lying areas. The increase in sea level by 2100 is estimated at about 100 cm according to Egypt's Third National Communication, taking into account the land subsidence in the Delta (Ministry of Environment, 2016). The increase in sea level will have a negative impact on low-lying areas, especially the northern lakes, changing the water quality of these lakes and affecting fisheries. It will also cause salt water intrusion into the aquifers in the Nile Delta, which will lead to soil salinization, deterioration of crop quality and lower productivity. Rising temperatures will also aggravate water scarcity effects, increase rates of water requirements for agricultural crops, affect productivity and have a negative impact on food security and a direct impact on ecotourism due to the negative effect on the marine environment and coral reefs (Ministry of Environment, 2016).

These risks arising from the impacts of climate change require international cooperation to adapt to them in accordance with appropriate standards, objectives, policies and efforts (Information and Decision Support Center, 2013), in line with Vision 2030 and its strategic plans to achieve the SDGs (Ministry of Planning, Monitoring and Administrative Reform, 2016).

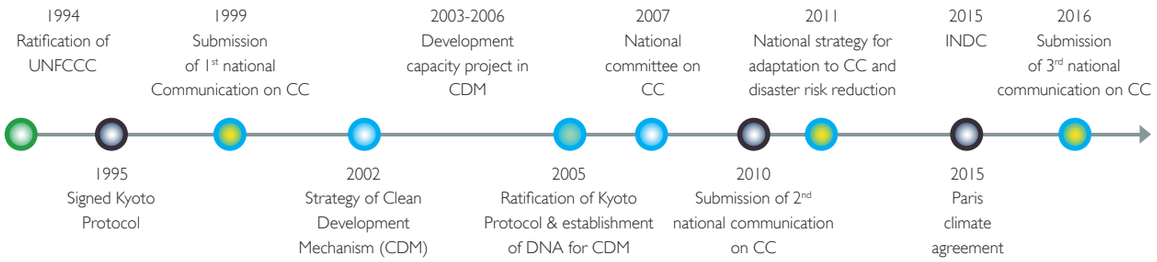
In this regard, Egypt seeks to fulfill its obligations under international agreements, the latest of which is the Paris Agreement, which Egypt signed in 2016 and ratified in 2017 (Ministry of Environment, 2018).

Egypt has adopted a set of actions and policies to respond to the challenges of climate change, as shown below in Figure (9).

These actions and policies are in line with Sustainable Development Goal 13 to take urgent action to address climate change and its impacts, in particular the following first objectives:

- enhancing resilience to climate-related hazards and natural disasters in all countries, and promoting capacity to adapt to these risks.
- Integrating climate change measures into national policies, strategies and plans, improving education, awareness-raising and human and institutional capacities on climate change mitigation, adaptation and early warning (UN, 2017).

Figure (9): Some of the measures and policies adopted by Egypt to respond to the challenges of climate change




**Source:** Ministry of Planning, monitoring and Administrative Reform 2018

To achieve these goals at the national level, "Vision 2030" included four strategic environmental objectives that lead to reducing climate change and adapting to it through the need to halt environmental degradation, maintain a balance between population growth and available natural resources, and shift to more sustainable consumption and production patterns. Efforts should also be geared towards the establishment of a sustainable energy system as referred to in the third Section on Energy (Ministry of Planning, Monitoring and Administrative Reform 2016).

To reduce emissions, the Arab Republic of Egypt has adopted several policies with a focus on energy production and consumption as the most contributing to emissions such as:

1. Expanding the use of renewable energy to 20 per cent of total energy demand by 2022.
2. Shifting to natural gas in electricity generation.
3. Expanding the linking of electricity and natural gas networks with neighboring countries.
4. Promoting energy efficiency initiatives in all energy producing and consuming activities.
5. Expansion of environmentally friendly mass transport networks.
6. Energy price reform policies to reduce waste and rationalize consumption.

In the field of adaptation, within the framework of the National Strategy for Adaptation to Climate Change and Disaster Risk Reduction adopted in 2010, Egypt aims to increase the Egyptian society's resilience in dealing with climate change risks and disasters and their impacts on various activities, and to strengthen the capacity to absorb, contain and reduce these risks and disasters.

The strategy focused on the most vulnerable areas, coping with the uncertainty of the Nile River, recommending building an effective institutional system for managing climate change crises and disasters in agriculture, developing weather forecasting systems, and increasing the efficiency of health care systems. The strategy also stressed the need for effective cooperation between state agencies and civil society organizations, and underlined the importance of international and regional cooperation to address climate change dangers.

Egypt is keen to take advantage of international funds and facilities to finance various projects in order to reduce emissions and adapt to climate change effects, taking into account the importance of technology transfer and capacity-building (World Bank 2017). These funds include the "Green Climate Fund", which was established with the agreement and cooperation of 194 governments worldwide to reduce greenhouse gas emissions in developing countries, and to help vulnerable communities adapt to the adverse effects of climate change.

The Ministry of Environment has successfully secured funding from the "Green Climate Fund" for energy-efficiency and renewable energy projects. Details will be mentioned in Part 8: Egypt and the World.

## 8. Egypt and the World

The Egyptian government recognizes the importance of learning from the experiences of other countries in the field of sustainable development, capacity-building as well as benefiting directly and indirectly from assistance in the field of modern technologies. Egypt has intensified its partnership with the United Nations organizations, programmes and regional commissions to obtain the technical and institutional support of these institutions.

Within the framework of cooperation with the European Union, the Ministry of Environment is working through the "Horizon 2020" Initiative "Phase II" on three axes. The most important of which is to raise the efficiency of the workers in the waste system through participation in training related to the safe disposal of demolition and construction waste, in addition to the preparation of a national team trained on the integrated management of marine litter. In this regard, 50 staff members of the Ministry and its regional branches were trained to form the Training of Trainers team. In order to ensure sustainability and to generalize this experience, a number of trainers carried out training on marine litter management in two regional branches overlooking the Mediterranean with EU funding. The third area is directed towards cooperation in the field of sustainable environmental awareness.

The Mediterranean Partnership Project's Phase II follows the success realized during its first phase and focuses on cooperation activities with the Global Environment Facility (GEF). Project activities focus on cooperation in integrated coastal management, biodiversity and climate change mitigation with a budget of over $ 7 million for a number of Mediterranean countries, including Egypt.

Cooperation with the World Bank is focused on the fight against air and water pollution. With the support of the World Bank, an air pollution management project in the Greater Cairo and Delta region is currently being launched with a budget of $ 1.3 million, including the inventory of air pollutants of various types and the study of their health and economic impacts. The duration of the project is five years during the period from 2016 to 2021 and is expected to be extended for one more year.

In line with the Ministry of Environment's keenness to fulfill its international obligations with partners within the framework of international conventions, its cooperation with the Mediterranean Action Plan (MAP) Secretariat, the executive arm of the Convention for the Protection of the Mediterranean Environment from Pollution, is represented in the signing of a short-term agreement (Small Scale Fund Agreement) with the Mediterranean Environmental Monitoring Programme. This Programme provides support in the monitoring of marine litter in the Mediterranean and monitoring of marine pollutants from land-based sources. Emphasizing Egypt's pioneering role, Egypt has been selected as the Deputy Chief Executive Officer of the plan and a member of the Convention's Environmental Compliance Committee, which reviews countries' implementation of their legal obligations and their submitting of their periodic reports.

The Mediterranean Quality Report on Integrated Coastal Management, Biodiversity Conservation and Pollution Reduction is also being prepared. The Ministry participated in the Mediterranean Investment Conference with the support of the European Investment Bank. The annual capacity-building programme for the Ministry's staff, presented by the Secretariat of the Regional Convention for the Conservation of the Environment of the Red Sea and the Gulf of Aden, has also been implemented, particularly in the fields of oil pollution damage response and emergency response.

In the field of Arab cooperation, the Ministry participated in the work of the Egyptian-Jordanian Committee to support the approach towards the green economy, moving forward towards a national strategy for green economy and joining the Green Growth Institute to build capacity in this field to integrate the concept in various economic activities, as well as studying Saudi Arabia's "Vision 2030" and other countries in conjunction with updating Egypt Strategy 2030.

Cooperation is promoted with international organizations, particularly with regard to funding policies. Therefore, the Ministry participated in the Steering Committee of the UN Development Assistance Framework (UNDAF) in Egypt and coordinated with the Egyptian-European Association Agreement Action Plan within the framework of the Technical Assistance and Information Exchange Mechanism. Accordingly, funding programmes were presented for scholarships or the recruitment of experts to raise the competencies of the Ministry's employees and its regional branches. Cooperation with the French Agency for Development in North Giza development project is also ongoing.

**Source:** NASA Marshall Space 2010



The voluntary national review of the implementation of the Sustainable Development Goals at the national level, launched in 2018, is a good example of this partnership, to objectively assess Egypt's progress towards the SDGs, identify obstacles, and devise unconventional ways to resolve them under the United Nations umbrella (Ministry of Planning, Monitoring and Administrative Reform, 2018).

Believing in the importance of cooperation at the regional and international levels, and in order to achieve the seventeenth Sustainable Development Goal related to strengthening the means of implementation and revitalizing the global partnership for sustainable development, Egypt was keen to regain its leading position in the African Continent through the presidency of the Conference of African Ministers of Environment during its 2015 – 2017 Session.

In view of its leading role in the African Continent, Egypt contributed strongly to the implementation of the African "Agenda 2063". In May 2017, the African Union's Ministerial Committee approved the implementation of "Agenda 2063" first Ten-year Implementation Plan. In this regard, the Major Programme on Outer Space identified the implementation of the Global Environment Monitoring Program and the Africa Support Program for Land Surveillance. The Agenda considered the intense competition for natural resources a threat to the Continent's stability. One of the goals and ambitions of "Agenda 2063" was therefore to sustain the environment in order to create an atmosphere conducive to the prosperity of African economies and societies. (African Union Commission, 2015).

In this regard, Egypt ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994, the Kyoto Protocol in 2005 and the Paris Agreement in 2017, and is in the process of ratifying the Doha Amendment.

As referred to in the Annual Report, Egypt has actively participated in the 23rd Session of the Conference of

the Parties (COP23) to the United Nations Framework Convention on Climate Change (UNFCCC) that was held in Bonn, Germany in 2017. As of 2018, Egypt assumed the chairmanship of the Group of 77 in China, as well as the African Climate Change Negotiators Group.

In addition to these international efforts, Egypt has prepared two very important initiatives, one on renewable energy in Africa and the other on mobilizing international support for adaptation activities in the continent (Ministry of Environment, 2017).

Egypt also hosted the 18th meeting of the Green Climate Fund, during which the Ministry of Environment succeeded in obtaining funding for a total amount of $ 357 million for energy- efficiency and renewable energy projects, in cooperation with the European Bank for Reconstruction and Development, and the Ministry of Electricity and Energy.

Egypt's "Vision 2030" has identified as one of its strategic objectives the necessity and importance of the State's implementation of its international and regional commitments towards environmental agreements and the establishment of the necessary mechanisms to ensure compliance with local policies. Egypt's "Vision 2030" has developed nearly 18 indicators to measure environmental performance through 2030. In this context, Egypt has put in place policies and programmes to promote international and regional cooperation to ensure that the consumed water resources reach 80 per cent, and the average per capita share of fresh water resources is 950 cubic meters / year by 2030. Egypt is also striving to achieve a 100 per cent reduction in ozone-depleting gasses by 2030 (Ministry of Planning, Monitoring and Administrative Reform, 2016).

As a result of the steps and policies taken by Egypt to protect the environment, the 2018 Global Environmental Performance Index (EPI) - covering the data for 2017 - indicated that Egypt has achieved progress at the global level in environmental performance indicators. The Global Environmental Performance Index (EPI) evaluates countries according to their performance on environmental issues of global priority. The assessment process relies on the frameworks and policies used to protect human health from environmental pressures and negative impacts (which is estimated at 40 per cent of assessment score) while environmental protection systems and policies account for about 60 per cent of the total score.

Egypt marked a progress at the global level. It ranked 66th in the 2018 EPI for the 2016–2017 indicators out of 180 countries surveyed this year, compared to its 104th rank in 2016 (Figure 10). Moreover, Egypt's ranking improved at the Arab level, as it held the 6th position in 2018 out of 16 Arab countries included in the 2018 Index, compared to the 11th place in 2016. Egypt also ranked fourth at the African level in the 2018 report, compared to the10th position in the 2016 Report.



Figure (10): Development of Egypt's rank at the Arab, African and international levels


**Source:** CEDARE, Data Adapted from Yale University and Columbia University 2018

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