



Arab Republic of Egypt

# EGYPTIAN INTENDED NATIONALLY DETERMINED CONTRIBUTION

# The Arab Republic of Egypt

## Intended Nationally Determined Contributions as per United Nation Framework Convention on Climate Change

### 1. PREAMBLE

In accordance with Decisions 1/CP.19 and 1/CP.20, the Arab Republic of Egypt hereby submits its report on the Intended Nationally Determined Contributions (INDCs) towards achieving the objectives of the United Nations Framework Convention on Climate Change (UNFCCC) set forth in Article 2 thereof. The report provides information which enhances clarity, transparency, and understanding of Egypt's INDC.

#### INDC Definition:

Measures determined and intended to be applied by the country to face climate change in terms of adaptation (to climate change impacts) and mitigation (reducing greenhouse gas emissions).

#### The INDC Report includes the following elements:

1. National circumstances that address general economic conditions, including economic and population growth rates, major sustainable development goals, and political circumstances.
2. National efforts implemented to combat climate change in Egypt, in terms of treating impacts in different sectors (agriculture, water resources, coastal zones, etc.) or efforts made to reduce GHGs emissions in different sectors (energy, transportation, industry, etc.).
3. Required implementation mechanisms to achieve the objectives of the plan (funding, capacity building, and technology transfer).

#### Summary of Intended Nationally Determined Contributions are presented in the following sections.

### 2. NATIONAL CIRCUMSTANCES

The Egyptian environment is influenced by many national, regional, and global factors. National factors include, but are not limited to, the following:

#### 2.1 Population Growth

Globally, Egypt ranks 16<sup>th</sup> in terms of population estimated at 89 million (August 2015). Between 1990 and 2015, the population grew by 30 million inhabitants, with an annual growth rate of 2.2%, and a total increase of 30% compared to 1990 census. UN population prospect reports anticipate that the annual growth rate will remain over 2% until 2040, where The Egyptian population is estimated to reach 116 million

68000000 people in  
1990



inhabitants.

As per the World Bank, the population density was estimated at 82.43 inhabitant/km<sup>2</sup>. In 1990, the population density was 58.1 inhabitant/km<sup>2</sup>. Rural population, as a percentage of total population, was 56 %, 57% and 57%, in 1990, 2000, and 2010 respectively.

High population growth rates and densities impose huge pressure on the economic, social, and environmental dimensions of sustainable development.

## **2.2 Economic Conditions**

- **Economic Situation during FY 2014/2015**

2014/2015 Fiscal Year (FY) witnessed a significant improvement in the real economic growth rate, which increased during the first nine month of this year to reach 4.7%. The growth rate is expected to reach 4% by the end of FY 2014/2015 with a major contribution from the service sector. The net direct foreign investment reached \$6.4 billion during FY 2014/2015 compared to about \$4.1 billion last year, which represents an increase of approximately 55%. Moreover, the recent efforts and reform simply the government were successful in improving and stabilizing the credit rating of Egypt. In addition, the unemployment rate has fallen in the period April-June 2015 from 13.3% to 12.7% compared with the same period during the two previous years. The foreign debts decreased by the end of July 2015 to \$47.1 billion compared to \$48.1 billion in June 2015. Despite the noticeable improvement in the economic indicators, the Egyptian economy is still facing certain ongoing challenges. These challenges include the high inflation rate and the trade deficit caused by the decline in petroleum exports as a result of the falling world oil prices, along with the increase in the balance of payments on commodity imports.

- **Planned Economic Situation during FY 2015/2016**

The Economic and Social Development Plan for FY 2015/2016 aims at increasing the real economic growth rate to reach 5.5% and puts special emphasis on national mega projects.

- **Planned Economic Situation up to 2030**

In light of the current global trend towards the adoption of post-2015 sustainable development goals, Egypt has developed the "*Sustainable Development Strategy; Egypt's Vision 2030*" which serves as a roadmap for the country to achieve its desired sustainable development goals during the next 15 years. This strategy promotes the optimum use of available resources, enhancement of Egypt's competitiveness and revival of its historic leading role in the region. Moreover, such strategy aims at fulfilling the aspirations of the Egyptian people regarding their right to a decent standard of living. The goals outlined in the strategy are in line with the global sustainable development goals (SDGs).

## 2.3 National Objectives and Priorities

- Create an enabling and favorable environment for local and foreign private investment, redistribute investments in a manner, which ensures geographical balance, develop the State's administrative apparatus and fight corruption.
- Improve the living standards of citizens, empower the youth through the provision of decent and productive job opportunities and build their skills in order to keep up with the demands of the competitive labor market.
- Create an enabling infrastructure for the development of Micro, Small and Medium Enterprises (MSME) and provide substantial support to vocational education and training.
- Focus efforts on controlling population growth.
- Support the current production base and remove barriers.
- Focus on marginalized social groups, and those mostly affected by economic reform policies.
- Combat all forms of corruption, apply required restructuring measures, and enforce the new Civil Service Law no. 18/2015.
- Implement economic structural reforms to increase productivity, provide job opportunities, and generate income for different community sectors.
- Provide protection to the poor, the low-income groups and the middle class.

### *National Mega Projects Planned in the Near Future:*

- Development of Suez Canal Axis Project
- Reclamation of One and a Half Million Feddan Project as part of a long-term plan to reclaim 4 million Feddans
- One Million Housing Units Project, within the framework of social housing program
- New Development Axis
- Mega Storage and Logistics Centers
- Golden Triangle of Mineral Wealth in South Egypt
- Fourth and fifth phases of the underground metro
- Development of priority areas including Sinai/the Western North Coast and its desert hinterland/South Egypt
- Construction of the new administrative capital

### *National Objectives and Priorities are further elaborated in the "Egyptian National Strategy for Sustainable Development" and include the following:*

- Competitiveness and diversity
- Expanding the scope of sustainable growth
- Activating Egypt's role in the global economy and improving its ability to adapt to global changes
- Increasing the real per capita GDP to reach the same level of middle-income countries
- Improve the legislation and legal frameworks promoting the dynamics of sustainable and decentralization development.

## 2.4 Political and Social Context

- Egypt has witnessed many positive developments during the past year with regards to political stability. In January 2014, a new constitution was adopted and in May 2014 President Abdel Fattah El-Sisi was elected as President of the Republic. Moreover, holding the parliamentary elections set for October and November 2015 is the final step in the implementation of the country's political roadmap.
- Concerning social justice, the government seeks to achieve the following goals:
  - Expand social security allocations to include self-employed farmers who own more than one Feddan and expand their medical insurance.
  - Launch a cash transfer programme and increase the number of beneficiaries.
  - Establish logistic centers for grain trade and storage to achieve food security.
  - Replace traditional ration books with smart cards, adopt a new rationing system and apply the new bread supply system.
- Upon assuming office, President Abdel Fattah El-Sisi announced a wide range of projects and reform plans. During Egypt Economic Development Conference (EEDC) that was held 13-15 March 2015, the Government launched its economic reform program designed to restore fiscal stability, drive growth rates, and attract domestic and international investors in key sectors.
- Egypt has witnessed significant improvement in a number of social indicators over the past two decades. However, Egypt still seeks to increase human development rates. Children death rates and malnutrition cases have been reduced by 50%. In the meantime, life expectancy has risen from 64 to 71 years during the same period.

## 3. NATIONAL EFFORTS in ADAPTATION AND MITIGATION

### 3.1 Egypt's Adaptation Efforts

#### 3.1.1 Adaptation Challenges (Climate Change Risks)

The vulnerability of Egypt's water resources to climate change depends on Nile flows, rainfall, and ground water.

In the agricultural sector, climate change studies expect that the productivity of two major crops in Egypt - wheat and maize –will be reduced by 15% and 19%, respectively, by 2050. Losses in crop productivity are mainly attributed to frequent temperature increase, irrigation water deficit, and pests and plant disease. In addition, 12% to 15% of the most fertile arable land in Nile Delta is negatively affected by sea level rise and salt water intrusion.

In terms of livestock production, current evidence shows that temperature rise leads to harmful heat stress, which negatively impacts livestock productivity. New animal

diseases have emerged in Egypt, which have strong negative impacts on livestock production. These include bluetongue disease and rift valley fever, which are both attributed to significant changes in the Egyptian climate.

Climate change is expected to increase seawater temperature, shifting fish distributions northwards to live in deeper waters. In addition, increased water salinity in the coastal lakes in Egypt is expected to negatively affect fish species.

Coastal zones are expected to suffer from climate change direct impacts. These include sea level rise and the overflow of low-level land. Estimations indicate that sea level rise by 50 cm leads to serious impacts on low-level lands in Delta and adjacent highly populated cities such as Alexandria and Port Said. Consequently, this will result in a more significant challenge, which is the migration of people from the affected areas to other areas, thus affecting the efficiency of different services and increasing the financial cost required for their development.

As for the tourism sector, coral reefs which constitute a major attraction in Red Sea resorts are highly vulnerable to climate change. In urban areas, heat islands<sup>1</sup> formed by hot air arising from the increasing use of energy in buildings represent the main concern in hot arid climates.

In addition, one of the most significant potential negative impacts of climate change is the harm inflicted on national heritage as result of temperature rise, sandy winds and ground water. However, this is not just a national concern. Instead, it is a global challenge since this heritage is part of the human heritage.

In the health sector, climate change increases direct and indirect negative impacts on public health in Egypt. For example, in 2015 the negative impacts are represented in higher death rate due to heat stress.

In the energy sector, the increase in temperature negatively affects the efficiency of conventional power plants and photovoltaic cells. Moreover, the sea level rise threatens the electric power plants and networks located along the coasts. Also, the negative impact of climate change on rainfall rates and rain distribution across different regions negatively affects power generation from hydropower plants. This, of course, is in addition to the increased electricity consumption rates as a result of the use of air conditioners.

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<sup>1</sup> Heat island is a meteorological phenomenon which happens in cities. Spaces between high buildings from different sides traps heat, which affects weather in cities.

### **3.1.2 Egypt's Intended Actions to Promote Resilience**

#### **a. Water Resources**

Several measures are currently being considered to adapt to decreasing water resources or increasing Nile flows. These primarily include:

- Maintaining water level in Lake Nasser
- Increasing water storage capacity
- Improving irrigation and draining systems
- Changing cropping patterns and farm irrigation systems
- Reducing surface water evaporation by redesigning canal cross sections
- Developing new water resources through upper Nile projects
- Rain water harvesting
- Desalination
- Treated wastewater recycling
- Increased use of deep groundwater reservoirs

In addition, public awareness is being raised on the need for rationalizing water use, enhancing precipitation measurement networks in upstream countries of the Nile Basin, encouraging data exchange between Nile Basin countries, and developing Circulation Models to predict the impact of climate change on local and regional water resources.

#### **b. Agricultural Security**

Changing sowing dates and good management practices are among the important adaptation measures oriented to mitigate climate change. Changing cultivars to those that are more tolerant to heat, salinity and pests, and changing crop pattern are the most promising adaptation measures at the national level. Moreover, using different multi-level combinations of improved surface irrigation systems and applying deficit irrigation are successful means of increasing surface irrigation system capacity in traditional lands to overcome the negative impacts of climate change.

Concerning livestock, improving the current low productivity of cattle in addition to improving feeding programs are being considered. No clear adaptation options are defined for fishery wealth.

There is a dire need for further studies on the impacts and adaptation to climate change in the agricultural sector in order to develop an adaptation strategy, which overcomes the barriers to implementing adaptation measures. These barriers include limited scientific information and strategic visions, and lack of financial support.

#### **c. Coastal Zones**

Adaptation options for coastal zones are highly site-dependent. However, changes in land use, integrated coastal zone management, and proactive planning for protecting coastal zones are necessary adaptation policies. Providing job opportunities in safe areas (in locations that are not impacted by climate change) is an important priority to successfully absorb affected population.

#### **d. Additional Adaptation Policies and Measures**

Egyptian authorities are currently focusing on the following additional policies and procedures:

- Building institutional capacities of comprehensive collection and analysis of monitoring and observations and geographic data;
- Identifying indicators and conducting full assessment of vulnerable sectors and stakeholders;
- Enforcing environmental regulations;
- Identifying and applying protection measures of vulnerable touristic and archaeological sites and roads against extreme natural phenomena such as floods, dust storms and extreme weather conditions;
- Building capacities for using regional water circulation models
- Proactive planning and integrated coastal zone management
- Risk reduction; and
- Increasing awareness of stakeholders for energy and water utilization

#### **3.1.3 Adaptation Action Packages**

##### **Coastal Zones:**

1. Reduce climate change associated risks and disasters.
2. Capacity building of the Egyptian society to adapt to climate change and associated risks and disasters.
3. Enhance national and regional partnership in managing crises and disasters related to climate change and the reduction of associated risk.

##### **Water Resources and Irrigation:**

- 1- Increase investments in modern irrigation systems.
- 2- Cooperate with Nile Basin countries to reduce water evaporation and increase river capacity.
- 3- Develop national policies to encourage citizens on water use rationalization.

##### **Agricultural Sector:**

- 1- Build an effective institutional system to manage climate change associated crises and disasters at the national level.
- 2- Activate genetic diversity of plant species with maximum productivity.
- 3- Achieve biological diversity of all livestock, fishery, and poultry elements to protect them and ensure food security.
- 4- Develop agro-economic systems and new structures to manage crops, fisheries and animal production, which are resilient to climate changes.
- 5- Increase the efficiency of irrigation water use, while maintaining crop productivity and protecting land from degradation.



- 6- Review of new and existing **land use** policies and agricultural expansion programs to take into account possibilities of land degradation in Delta and other affected areas resulting from Mediterranean Sea level rise.
- 7- Develop systems, programs and policies to protect rural community and support its adaptive capacity to the expected trend in land use change, plant and animal production, and internal migration due to climate change.

#### **Health Sector:**

- 1- Identify potential health risks as a result of climate change.
- 2- Raise community awareness about climate change risks and means of adaptation.
- 3- Increase the efficiency of healthcare sector and improve the quality of health services in dealing with climate change.
- 4- Support Ministry of Health efforts to improve the social and economic status and population characteristics.

#### **Rural Areas, Population, and Roads**

- 1- Draw a baseline scenario for the optimal regional distribution of population and economic activities within the geographical boundaries of Egypt up to the year 2100, taking climate change into consideration.

#### **Tourism Sector**

- 1- Reduce climate change risks in touristic areas.
- 2- Engage users in supporting the proposed strategy.
- 3- Support periodical monitoring and observations systems and follow-up bodies.
- 4- Raise environmental awareness.
- 5- Cooperate with international bodies.
- 6- Incorporate disaster risks within the plans to promote sustainable tourism in Egypt.
- 7- Capacity building of local communities in touristic areas.

#### **Energy Sector**

- 1- Conduct comprehensive studies to assess the impact of climate change on the energy sector, propose appropriate adaptation measures, and estimate the economic cost of the proposed adaptation measures. In addition, these studies should determine the safe locations for the construction of power generation projects.
- 2- Build institutional and technical capacities of different units in the energy sector in climate change issues.
- 3- Support research and technological development to enable the electricity sector to deal properly with climate change.

## 3.2 Mitigation Policies and Measures

### 3.2.1 Mitigation Policies

The key for Egypt to mitigate GHGs emissions is to provide appropriate foundations for the development of low carbon energy systems.

Pathways to achieving high CO<sub>2</sub> mitigation levels comprise the following:

- Widespread diffusion of locally-appropriate low-carbon energy production technologies, with substantial reductions in energy intensity
- Comprehensive mitigation efforts covering all major sources of emissions
- Locally-appropriate technology transfer and financial flows from industrialized countries (Annex I countries) to support carbon emission abatement according to the UNFCCC principles, which acknowledges that developed countries should provide required support to developing countries in this regard.

*Policies targeting development that is more sustainable rely upon five main pillars:*

1. More efficient use of energy, especially by end users;
2. Increased use of renewable energy as an alternative to non-renewable energy sources;
3. Use of advanced locally-appropriate and more-efficient fossil fuel technologies, which is less-emitting, in addition to new generations of nuclear power;
4. Energy efficiency is the cornerstone to be targeted by policy makers to decouple demand on energy and economic growth; and
5. Reform energy subsidies. This policy is implemented using four pillars, namely: set different prices for petroleum products based on energy generation efficiency; increase the efficiency of energy use; provide support to certain sectors to promote switching from conventional energy sources to clean energy sources; and apply the fuel subsidy smartcard system to ensure that subsidies are received by target beneficiaries.

The degree to which efficiency improvements can limit energy demand growth is one of the main distinguishing characteristics of greenhouse gas reduction pathways. Energy efficiency could be improved radically through a combination of behavioral changes and rapid introduction of stringent efficiency regulations, technology standards, and environmental externality pricing, which mitigates rebound effects.

Renewable energy technologies, which are relevant to the local context, will play a very important role in reducing GHG emissions, but they would not suffice to keep climate change manageable. However, renewable energy may provide a number of opportunities since it also addresses sustainable and equitable economic development, energy access, secure energy supply, and reduced local environmental and health impacts.

In addition, efforts in Egypt should focus on replacing or upgrading obsolete infrastructure e.g. upgrading old fossil fuel power plants with locally appropriate technologies to increase its capacity. This needs increase financial support from Annex I parties in addition to technology transfer and local capacity building.

There are four key technology-related requirements essential for transformation: (i) continued support of energy conversion efficiencies, (ii) carbon capture and storage “CCS” as a technology alternative that can be used in the future if proven economically feasible, (iii) co-utilization of fossil fuel and biomass in the same plants, and (iv) utilization of co-generation plants.

Using advanced generations of nuclear reactors could be important to fill the gap between reducing fossil fuel dependence and the deployment of renewable energy. In addition, nuclear energy can be an important contributor in the future energy mix to stabilize CO<sub>2</sub> levels as energy demand continues to grow.

Additional mitigation measures include the increase of the country’s CO<sub>2</sub> absorptive capacity through plantation, maintaining suitable types of trees along road sides, the middle-island of inter-city and urban roads, and on irrigation and drainage canal banks. In addition, wood forests should use treated wastewater for irrigation.

### 3.2.2 Mitigation Actions

The two following tables present the most important mitigation actions across different sectors at the national level.

**Table 2. Greenhouse Gas Mitigation Measures in Different Energy Sub-Sectors**

Sector	Mitigation measure
Industry	Energy efficiency improvements
	Utilization of solar energy for water heating
Transportation	Energy efficiency improvements
Passengers	Increase Share of Railways Pass. Transport
	Increase Share of Buses Pass. Transport
	Increase Share of Microbuses Pass. Transport
	Increase Share of River Pass. Transport
	Cairo metro (Line 3 phase 3& 4 + Line 4)
Freight	Improve road transport efficiency
	Switch from road to river transport
	Switch from road to rail transport
Agriculture	Energy efficiency improvements
Res. & Comm.	Energy efficiency improvements
	Utilization of solar energy for water heating
Electricity	Energy efficiency improvements
	Nuclear energy use for power generation
	Renewable energy use for power generation
Petroleum	Energy efficiency improvements

**Table 3. GHGs Emissions Reduction Actions in Non-Energy Sectors**

Sector	Mitigation Measure
Agriculture	Enteric fermentation
	Manure management
	Rice cultivation
	Agricultural soils
	Field burning of agricultural residues
Waste	Solid waste
	Wastewater
	Incineration
Industrial Processes	Encourage waste management and recycling
	Optimize the production of cement, lime, iron and steel, ammonia not used in urea, nitrogenous fertilizers and nitric acid.
Oil and Natural Gas	Production and processing
	Venting and flaring (waste heat)

#### 4. NEW MARKET MECHANISMS

A national market for carbon trading may be established. This national market may further be developed into a regional market, which can attracting foreign direct investment in national carbon credit transactions, especially in the Arab and African region.

#### 5. NEED FOR STRONG ECONOMIC APPROACH

Within this context, Egypt needs to develop and implement a strong economically feasible mitigation program in the near future, which would achieve the proposed emission reduction for 2030 at the lowest cost to the national economy.

Hence, an Egyptian comprehensive emission reduction program should be based on three main initiatives:

1. Stimulate mitigation actions through a portfolio of strong and coordinated policies for the efficient reduction of GHGs across industry sectors and different geographic areas.
2. Pursue energy efficiency and low-cost options through the following:
  - Fast development of the infrastructure required for low-carbon energy systems; and

- Encouraging research and development in promising technologies, which are suitable for the local context and stimulate their deployment.

3. Develop a national monitoring, reporting, and verification system.

The initial total estimated cost of implementing adaptation measures aiming at mitigating the negative impacts of climate change and the national endeavors aiming at contributing to the efforts made by the international community to **reduce GHG emissions during the period 2020-2030** is estimated at USD 73 billion. This figure is adapted to inflation rates and change in currency exchange rate for this period.

## **6. MEANS OF IMPLEMENTATION**

Implementation of INDCs **requires sustainable international support from reliable resources through financial flows, capacity building, and technology transfer as relevant to the local context.**

Preliminary estimates of the financial contributions required for implementing the INDCs for both adaptation and mitigations estimated at approximately 73.04 billion USD can be increased. In addition, transfer of technology appropriate to the local context and national capacity building are needed. Thus, Article 4 of the UNFCCC, which states that developed parties shall provide support to developing countries in applying their liabilities, should be enacted. Hence, Egyptian national efforts alone will not be able to fulfill the State aspirations in contributing to the international climate change abatement efforts. **Depending only on local financial resources, along with the large development aspirations of Egypt, will limit this contribution.**