

EUROPE, MIDDLE-EAST, AND AFRICA

EGYPT





Innovate UK



The background features a solid yellow field with several thick, diagonal pink stripes of varying lengths and orientations scattered across it. The stripes are positioned at various angles, some parallel to each other and others crossing them.

UNDERSTANDING EGYPT'S INNOVATION SYSTEM

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1.
COUNTRY PROFILE

COUNTRY PROFILE

1.1 INTRODUCTION

The main core elements of MTI strategy:

- 1 Stimulating innovation: At this stage stakeholders like the MTI or other ministries actively supporting innovation and competitiveness, besides innovation support entities (e.g. Academy of Scientific Research and Technology (ASRT), Industrial Modernization Center (IMC), Technology Innovation and Entrepreneurship Center (TIEC), technology transfer offices (TTOs) and technology innovation commercialisation offices (TICOs) take coordinating measures to motivate the private sector focus on innovation.
- 2 Enabling Innovation: This strategy focuses on measures that bring different innovation actors together, as well as facilitating and encouraging networking and collaboration activities, locally and internationally. The MTI's major role is to establish and finance the necessary structures as a dedicated part of an innovation-enabling infrastructure.
- 3 Facilitating innovation: Mechanisms to support industry and academia to turn those innovative ideas into actual products, processes, services and business models.
- 4 Commercialising innovation: This strategy includes measures supporting the private sector to get better access to the market in order to commercialise innovations made in Egypt.

¹ SDS, 2016

² MTI, 2016.

Despite challenges, Egypt is striving towards the formulation of a comprehensive national innovation system.

In the past decade, Egypt's economy has witnessed significant development in many sectors, notably science, technology and innovation (ST&I).

With a relatively young, tech-savvy population (more than 60 per cent of the population is under the age of 30), a growing economy (5.7 per cent GDP annual growth rate in 2018), a vibrant entrepreneurship scene, and an increasingly proven interest from international corporates in the Egyptian market, as well as different international organisations and donor agencies, the Egyptian innovation and technology ecosystem has seen significant positive development during the past decade. This has been reflected in Egypt's Vision 2030 and in the constitution adopted in 2014.

Accordingly, ST&I is now considered a main pillar in creating a competitive economy and a society based on knowledge and innovation by 2030.¹

In line with this vision, relevant governmental entities have designed their own ST&I relevant strategies.

For example, The Ministry of Higher Education and Scientific Research (MoHESR) has adopted its own National ST&I Strategy (ST&I 2030) focusing on two main pillars:

- Creating an enabling and supportive environment for science, technology and innovation.
- Knowledge transfer and localisation of technology to contribute to economic and community development.

The strategy is implemented in coordination with the Academy of Scientific Research & Technology (ASRT).

At the same time, the Ministry of Trade and Industry's (MTI) Industrial Innovation Strategy focuses on promoting an innovation culture, incentivising market-oriented research and development, and building strong links between academia and industry through creating clusters among companies and research institutes, and enabling companies to bring innovations to the market.²

Egypt's Ministry of Communications and Telecommunication Technology has also been working to foster ICT-based innovation through enhancing youth skills and providing much-needed support to young tech entrepreneurs.

Similarly, other ministries and governmental entities, civil society organisations, and business associations are embracing innovation in their activities and operations, even if not directly related to their respective mandates. These include the Ministry of Investment and International Cooperation, the Ministry of Planning, Monitoring and Administrative Reforms, the Central Bank of Egypt, etc.

Such a myriad of initiatives have enriched the national innovation system, but despite such progress in terms of activities and legislation encouraging entrepreneurship, research and development, there are still gaps in the coordination of such activities and a lack of ability to measure their real impact on the economy.

COUNTRY PROFILE

1.1 INTRODUCTION

GERD AS % OF GDP (2018)	GLOBAL INNOVATION INDEX GII (2019)	GLOBAL COMPETITIVENESS INDEX (2019)	HIGH-TECHNOLOGY EXPORTS (% OF MANUFACTURED EXPORTS) (2018)	PATENT APPLICATIONS RESIDENTS (2018)	TIME REQUIRED TO START A BUSINESS (DAYS) (2019)
0.72	Rank 92 with score 27.5	Rank 93 rd with score 54.5	0.87	997	12.5

Source: World Economic Forum; World Bank Indicators; UNESCO Institute for Statistics.

Egypt has made recent efforts to improve its science, technology and innovation through the adoption of encouraging legal and economic reforms. Such endeavours have been translated in the gradual improvement of its GII ranking (from 105th place in 2017 to 95th in 2018 and 92nd in 2019). These advancements were mainly fuelled by knowledge creation activities (e.g. scholarly outputs, number of research institutions and the number of patent applications).

However, on the market side, poor diffusion of knowledge is still hindering the spillover effect of such

improvements. There are clear gaps in the innovation system. Firstly, the lack of ministerial-level alignment in the ST&I policy causes difficulties in the formation of links among different agents. Such a coordinating role between ministerial strategies was mandated back in 2006 to the Higher Council for Science and Technology, yet the council is no longer active and did not have any binding budgetary decisions. Secondly, there is weak academia-industry collaboration despite the availability of skilled human capital.^{3, 4} It is, therefore, becoming a national priority to develop innovative policies to enhance the linkage process, notably given the low levels of private R&D spending.⁵

³ Egypt is ranked 117th out of 137 according to the WEF in the University-industry collaboration in R&D (2018)

⁴ Egypt is ranked 55th out of 137 countries in the availability of scientists and engineers indicator (Ibid.)

⁵ ESCWA, 2017

COUNTRY PROFILE

1.2 STATISTICAL HIGHLIGHTS

Egypt's ranking in the Global Innovation Index is lagging behind other countries with the same level of development.

In the table on the next page, Egypt's performance is compared to that of Jordan (due to a close GII score), Malaysia, Turkey (both considered as newly industrialised economies), and Israel (innovation leader in the Middle East according to the GII score).

Egypt's relative strength relies mainly on its big and dynamic market. The advancements in the ease of doing business and notably the implementation of the investment law and the supportive schemes by the Central Bank to fund SMEs, has considerably facilitated access to credit⁶, in addition to the encouragement of investment from VCs (even if the latter is still considered by many analysts to be relatively low).⁷

Furthermore, Egypt has a comparatively large workforce employed in knowledge-intensive services⁸

and relatively developed business clusters (e.g. Innovation Cluster Initiative in Alexandria and Assiut). In terms of output, Egypt has a growing GDP per worker (2.5 per cent on average) and due to the digitisation of many activities, computer spending as part of the GDP is relatively high.

Egypt has gradually developed in the gross expenditure allocated to R&D, universities' ranking score (partly thanks to the Egyptian Knowledge Bank initiative⁹ and other recent regulatory reforms), trade competition and market scale and creative goods' exports.

However, weaknesses are observed in the country's capital accumulation and the regulatory environment measure (defined as the ability of the government to formulate effective and well-coordinated policies to promote innovation and private sector development). As a result, the private sector is not engaged enough in R&D, where business expenditure on R&D is below average.

⁶ GAFI Business facts. Retrieved from <https://www.gafi.gov.eg/English/StartaBusiness/Pages/Business-Facts.aspx>

⁷ ECES (2017)

⁸ Knowledge intensive business services (KIBS) are services and business operations heavily reliant on professional knowledge. They are mainly concerned with providing knowledge-intensive support for the business processes of other organisations. As a result, their employment structures are heavily weighted towards scientists, engineers, and other experts.

⁹ Egyptian Knowledge Bank is established in 2016, and is considered one of the largest national projects in the field of education and scientific research <https://www.ekb.eg/about-us>

1.2 STATISTICAL HIGHLIGHTS

GII	EGYPT	ISRAEL	JORDAN	TURKEY	MALAYSIA
Overall GII score	27.5	57.4	29.6	36.9	42.7
Input Sub index score	33.3	63.3	37.1	45.3	52.9
Institutions	47.9	77.9	62.1	57.4	71.6
Human Capital And Research	19.7	54.5	29.4	36.3	44.2
Infrastructure	36.8	56.1	38.2	52.2	51.8
Market Sophistication	41.0	61.4	38.9	50.8	57.8
Business Sophistication	21.2	66.5	16.9	29.5	39.3
Output Sub Index Score	21.6	51.6	22.1	28.6	32.4
Knowledge And Technology Outputs	22.1	56.9	17.4	23.0	32.1
Creative Outputs	21.1	46.3	26.8	34.2	32.8
Source: Global innovation index (2019)					

COUNTRY PROFILE

1.3 HIGHLIGHTS OF KEY INNOVATION PROGRAMMES

RESEARCH DEVELOPMENT AND INNOVATION PROGRAMME (RDI)

The Ministry of Higher Education and Scientific Research launched this project with a grant of £9m with the collaboration of the European Commission in October 2007. The RDI programme's overall objective was to contribute to enhancing Egypt's economic growth and international competitiveness through improving its research, development and

innovation performance. The programme had three specific objectives: 1) Strengthening the link between the research and development (R&D) sector and industry while enhancing the innovation and technology transfer culture, 2) Evaluating the Egyptian Science, Research and Technology Landscape for the Design of the Egyptian Innovation Policy and Strategy, 3) Facilitating Egyptian participation in the European Research Area.

The first objective results were clearly demonstrated through the receipt of more than 700 proposals, of which 51 were granted, in two calls for collaborative projects between enterprises and research institutes/universities from Egypt, in addition to joint research projects with European partners. It is worth mentioning that ten innovation support projects received grants to establish technology transfer units and industry-related offices in universities and research institutes, as well as raise awareness and promote innovation among public and research communities. The Monitoring and Evaluation Component implemented in close collaboration with the Ministry was successful in conducting and analysing extensive surveys on R&D performance, innovation practices of Egyptian enterprises and industry needs. Finally, the programme was considered an important factor in promoting international and cross-border technology transfer.

http://www.crci.sci.eg/wp-content/uploads/2015/06/Evaluation_of_the_Egyptian_Science.pdf

NILEPRENEURS

An initiative that aims to raise young people's entrepreneurship awareness. The initiative was launched in 2017 by Nile University, following a five-year-agreement with the CBE, in collaboration with the Micro, Small, and Medium Enterprises Development Agency (MSMEDA), the Ministry of Planning, the Academy of Scientific Research and Technology, local banks, the Egyptian Banking Institute (EBI) (the educational arm of the CBE), and local and international entities and donors.

The CBE seeks to turn NilePreneurs into a national initiative that adopts international best-practices and progressive scientific methodologies. The initiative provides the necessary technical equipment and engineering consultancy for innovators through the design house located at the Nile University to reach a prototype in accordance with the standard operating procedures for product development. Similar models to the design house are to be established in three other universities.

A cooperation protocol has been signed between NilePreneurs and the Rowad 2030 project, implemented by the Ministry of Planning, Monitoring and Administrative Reform, where the ministry will finance the "Micro Factory" programme for small-sized products ranging from 50 to 100 units, supporting products from the ideation phase to the final stage of development.

<http://nu.edu.eg/nilepreneurs-new-initiative-central-bank/>

INNOVATION CLUSTER INITIATIVE

The Information Technology Industry Development Agency's 'Technology Innovation and Entrepreneurship Center' (TIEC), launched a network of 'Innovation Clusters' to enable innovation and entrepreneurship through public-private partnership (PPP). Each cluster specialises in a specific, promising ICT-enabled sector creating new job opportunities and providing accumulated experiences.

So far, two clusters have been developed in Borg Al-Arab and New Assiut.

<http://ici.eg/>

INNOAWARD

The Industrial Innovation award is implemented by the Ministry of Trade and Industry as a measure of its Industrial Innovation Strategy in efforts to stimulate innovation within Egyptian industry. The award is supported by the Egyptian-German Promotion of Small and Medium Enterprises (PSME) project.

The award will give recognition to outstanding innovations developed and implemented by Egyptian companies from all industrial sectors. It seeks to acknowledge innovative companies and their efforts in order to create awareness of innovation and motivate companies to innovate. The award has attracted more than 100 entries from companies in its first round in 2019.

http://www.ebtaker.org/en_us/about-us/

EGYPT KNOWLEDGE AND TECHNOLOGY ALLIANCES (E-KTAS)

E-KTAs is a cluster of partners working across the innovation chain, focusing on the national industrial priority sectors. The initiatives provide grants of up to £500,000 to a consortium of academic and research institutes collaborating with industrial partners and NGOs.

Fifteen alliances have now been formed (ie. the National Desalination Alliance; the National Alliance for Renewable Energy; the Petrochemicals and Pharmaceutical Industry Alliance; the Textile Industry and Space Science Applications Alliance, and others). The alliances have been formed through the participation of 135 companies, 55 universities and research centres, 18 ministries and government agencies and 20 civil society organisations.

The programme focuses on stimulating local manufacturing and the introduction of new technologies, where it has successfully launched 33 manufacturing prototypes including the production of high-quality spare parts to serve power stations, spare parts for Egyptian railway vehicles, and improved non-traditional oil recovery methods.

<http://www.asrt.sci.eg/index.php/grants-2/kta>

DIGITALISING AGRICULTURAL PRODUCTION

Egypt's Agriculture Ministry, in partnership with the United Nations Food and Agriculture Organisation (FAO), announced a joint project to develop a digital agricultural guiding model as part of the 2018-2020 National framework programme signed by the Egyptian Government.

The ministry announced that it is currently establishing a central information centre containing a full database on food production operations in the country, and forecasting operations for water usage and areas needed for cultivation.

The project also aims to develop a digital map of the country's landscapes to monitor areas of urban expansion and rates of desertification.

A map that monitors animal diseases and facilitates epidemic-control is also being designed, along with a plan to apply an early warning system of trans-boundaries diseases like rift valley fever.

<http://www.fao.org/egypt/news/detail-events/en/c/1204523/>

DIGITAL PUBLIC SERVICES

The Ministry of ICT, in collaboration with the Ministry of Planning, is leading an initiative for achieving a digital government and digital public services. The ministry is planning to launch around 25 digital public services during the year 2019. These services include notarisation, renewing driving licences, utilities and electricity, municipalities, agriculture and marriage officiants. Successfully implemented digital transformation initiatives to automate governmental agencies include E-Visa, Endowed Asset Management, Farmer's Card, Law Enforcement, Health Insurance, and more.

Unified citizen cards and manufacturing electronics are also projects that the ministry is planning to issue during the upcoming period. Citizens will use this card in all their financial deals and transactions. The main objective of this card is the financial inclusion of 20 million citizens entering the legal system of financial services.

http://www.mcit.gov.eg/Media_Center/Press_Room/Press_Releases/35249

NATIONAL PROGRAMME FOR TECHNOLOGICAL SPECIALISED INCUBATORS (INTILAC)

The Academy of Science, Research and Technology (ASRT) launched the 'INTILAC' programme to bridge the gap between academic researchers, professionals and the business community through supporting the transformation of innovative technological ideas into startup companies by providing the necessary financial, technical and logistical support.

The INTILAC programme is targeting undergraduate and postgraduate students to utilise their graduation projects, early-stage entrepreneurs, and researchers in Universities and Research Centers, providing the accepted applicants with financial support up to 150000 L.E/project in one year.

The programme has launched around 14 business incubators across Egypt's districts in collaboration with public and private universities, non-governmental organisations, and industrial chambers.

<http://www.asrt.sci.eg/index.php/grants-2/intilac-incubators>

COUNTRY PROFILE

1.4 HISTORICAL TIMELINE OF KEY POLICIES

Reform policy of ST&I system in Egypt

2007

The reform policy resulted in the restructuring of ST&I infrastructure and devised a model of organisation and funding that puts education and scientific research at the heart of development. The Higher Council for Science and Technology (HCST) and the Science and Technology Development Fund (STDF) were examples of new entities established in this period based on that reform.

Ratification of New Constitution setting an annual target for spending on R&D to reach 1% of GDP

2014

Development of the 'Industrial Innovation Strategy' and 'Egypt's ICT 2030 Strategy' as a translation for Egypt's Vision 2030 with identified key measures to reach Key Performance Indicators (KPIs) from the MTI and MCIT's side

2015

Introduction of Egypt Vision 2030 with a core pillar on Knowledge, Innovation & Scientific Research

2016

1 Establishment of national fund supporting innovators.

2 Introduction of the new Law of Financing Science, Technology and Innovation with a new entity responsible for funding ST&I as a substitute to STDF

2018

Formation of 'Incentives for Science and Innovation Law'

2019

2020

Issuance of the by-law of the new funding agency responsible for funding ST&I in Egypt

COUNTRY PROFILE

1.5.1 INSTITUTIONAL MAP OF THE INNOVATION SYSTEM

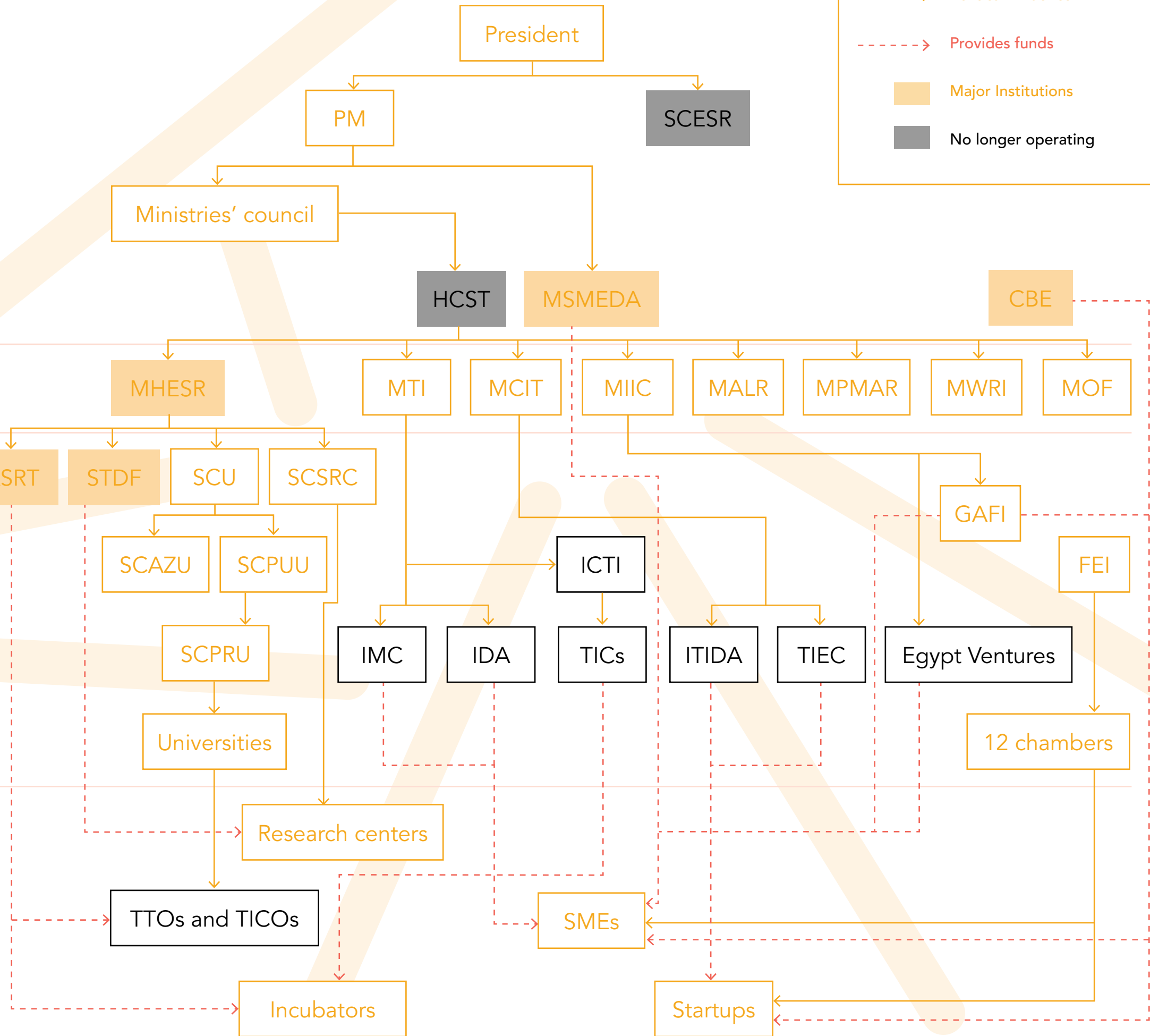
National System of Science, Technology and Innovation Policy

- This institutional map represents the existing organisational structure of the National System of Science, Technology, and Innovation Policy.
- HCST stopped activities in 2011.
- STDF is the main funding scheme for all research disciplines in Egypt. However, the parliament has passed a bill in June 2019 to form a new entity responsible for funding ST&I as a substitute to STDF, and it's by-law was issued in 2020.
- ASRT funding is focused on the establishment of innovation clusters and incubators and supporting the nationwide network of TTOs in Egypt.
- Every research institution in Egypt has its own institutional funding for R&D. This institutional funding is mainly supplied by the relevant ministries.
- Industry unions and chambers are important key players in the policy setting.

MINISTRIES COORDINATING COUNCILS AND INSTITUTIONS

INSTITUTIONS AND UNDER-MINISTRIES

FINAL BENEFICIARIES



→ Political influence
- - - - - → Provides funds
 Major Institutions
 No longer operating

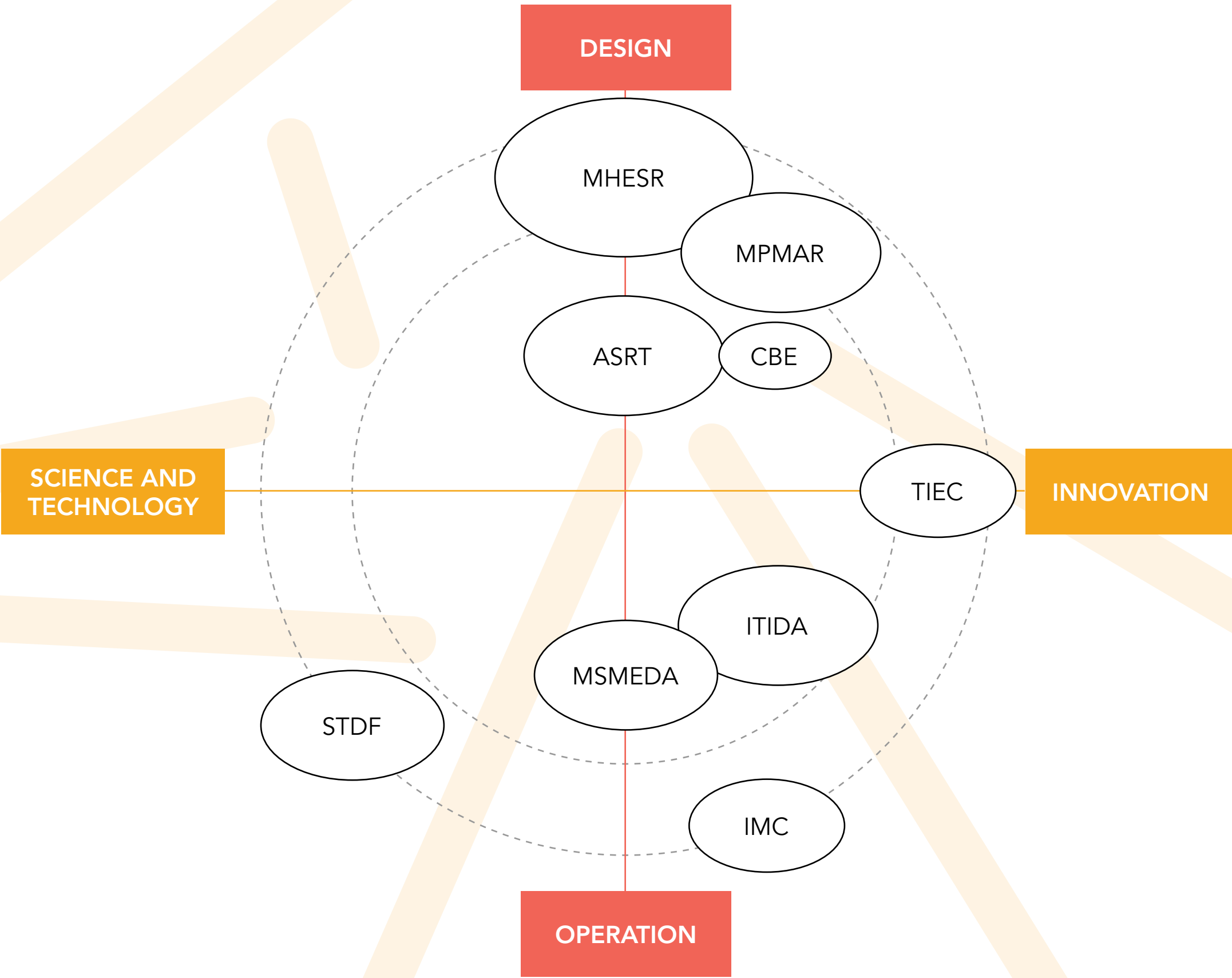
COUNTRY PROFILE

1.5.2 ROLE AND INFLUENCE DIAGRAM OF KEY MINISTRIES AND AGENCIES

- MHESR is the main body responsible for setting national STI policies in cooperation with ASRT (the main technical arm in policy implementation), while the MPMAR is responsible for allocating the budget for both.
- IMC, TIEC, and ITIDA aim to enhance the competitiveness of Egypt enterprise and act as an important intermediary and catalyst for many academia-industry interactions.

Level of influence: the bigger the size of the bubble, the more influence in the innovation system.

This influence map is indicative and reflects the insights of the project team rather than a formal statement of roles and structures.



1.6 GLOSSARY OF INSTITUTIONAL ABBREVIATIONS AND ACRONYMS

- **ASRT:** Academy of Scientific Research and Technology
- **CBE:** Central Bank of Egypt
- **FEI:** Federation of Egyptian Industries
- **GAFI:** General Authority for Investment and Free Zones
- **HCST:** Higher Council for Science and Technology
- **ICTI:** Industrial Council for Technology and Innovation
- **IDA:** Industrial Development Authority
- **IMC:** Industrial Modernisation Center
- **ITIDA:** Information Technology Industry Development Agency
- **MALR:** Ministry of Agriculture and Land Reclamation
- **MCIT:** Ministry of Communication and Information Technology
- **MHESR:** Ministry of Higher Education and Scientific Research
- **MIIC:** Ministry of Investment and International Cooperation
- **MPMAR:** Ministry of Planning, Monitoring and Administrative Reform
- **MOF:** Ministry of Finance
- **MSMEDA:** Egyptian Micro, Small and Medium Enterprises Development Agency
- **MTI:** Ministry of Trade and Industry
- **MWRI:** Ministry of Water Resources and Irrigation
- **PM:** Prime Minister
- **SCESR:** Specialized Council for Education and Scientific Research
- **SCSRC:** Supreme Council of Scientific Research Centers and Institutes
- **SCU:** Supreme Council of Universities
- **ST&I:** Science, technology and innovation
- **STDF:** Science and Technology Development Fund
- **TICOs:** Technology Innovation Commercialisation Offices
- **TICs:** Technology Innovation Centers
- **TIEC:** Technology Innovation and Entrepreneurship Center
- **TTOs:** Technology Transfer Offices

1.7 STRENGTHS AND WEAKNESSES ANALYSIS

¹⁰ Radwan & Sakr, 2017

¹¹ MTI, 2016

INSTITUTIONAL FRAMEWORK

STRENGTHS

Well-established set of institutions with a focus on scientific research and, to a lesser extent, on innovation

- Science, technology and innovation (ST&I) is clearly identified in the top priorities of the national 'Vision 2030' strategy, and the agenda of many governmental bodies.
- The mandate of ST&I key institutions ranges from a focus on scientific research (e.g. the Ministry of Higher Education and Scientific Research (MOHESR), Academy of Scientific Research and Technology (ASRT), Science and Technology Development Fund (STDF) to applied innovation and private sector development (e.g. Ministry of Trade and Industry, and Ministry of Communication and Information Technology).
- There are also institutions mandated to monitor, assess and manage the ST&I indicators (including periodic innovation surveys done by the Egyptian ST&I Observatory).

A dynamic recent wave of regulatory and institutional reforms

- A 2019 law formed a new entity as the main body responsible for financing ST&I on a national level. The law addresses the bureaucratic barriers that limited the role of STDF in financing innovations and managing innovation outcomes.
- Announcement of the 'Incentives for Science and Innovation' law that focuses on stimulating demand-driven innovation by giving universities and higher education institutions the authority to create business incubators and spin-off startups in collaboration with the private sector.
- These two laws came as a necessary step to enhance the alignment between scientific research and innovation.

Existence of business associations supporting young entrepreneurs and business owners

- Examples of these associations: the EJB (Egyptian Junior Business Association), EPEA (Egyptian Private Equity Association), MCSBE (Middle East Council for Small Businesses and Entrepreneurship).

WEAKNESSES

Institutional gap in the effectiveness and enforcement of the national strategy for research and innovation

- Existing technology roadmaps and strategies are not binding to the relevant actors and there aren't sufficient incentives to encourage the implementation of nationally-coordinated strategies.¹⁰
- A primary focus on 'research excellence', boosting the supply of knowledge, rather than the demand and use of knowledge. In response to this problem many actions have been taken, most importantly the 'Incentives for Science and Innovation' law, and recent innovation programmes that focus on engaging both academic and business elements. But the impact of these programmes has not yet been evaluated.¹¹

1.6 STRENGTHS AND WEAKNESSES ANALYSIS

¹² STDF,2012

¹³ MTI,2016

¹⁴ UIS, 2017

¹⁵ Radwan & Sakr,2017

¹⁶ Radwan,2015

FUNDING

STRENGTHS

Diversified mechanisms of public funding on R&D

- There are different funds and grants available from different entities to support applied research, prototyping, and product development. For example: Agriculture Research & Development Fund (ARDF), IMC, ITIDA, STDF, and the ASRT.¹²
- Financial and non-financial services are available for startups at different levels of maturity, offered by civil society NGOs, governmental entities (e.g. TIEC, INTILAC, NilePreneurs, Bedaya programme by GAFI, etc.).¹³
- There has been a gradual increase in expenditure on research and development: the gross expenditure on research and development (GERD) has reached 0.61 per cent of the GDP in 2017; in the period between the 1990s and 2017 the average value of GERD was 0.4 per cent, with a minimum of 0.19 per cent in 1999 and a maximum of 0.72 per cent in 2015. GERD will reach one per cent of GDP, according to Egypt's constitution (2014).¹⁴

WEAKNESSES

National funding for innovation and technology is highly fragmented

- Despite the availability of an adequate number of funding bodies, there is a lack of coordination among innovation support organisations.¹⁵
- Existing funds and support schemes aiming to facilitate innovations are mostly intended for public and academic entities. This setting increases the gap between the supply of knowledge, and real market demands. Accordingly, business expenditure in R&D is still lower than expected on average and is insufficient.
- Lack of effective monitoring and evaluation system of the different funding schemes and accordingly, the economic and technological impact. Therefore, the fact that public finance of research institutions is not based on clear performance measures and development plans.¹⁶

COUNTRY PROFILE

1.6 STRENGTHS AND WEAKNESSES ANALYSIS

17 Radwan & Sakr, 2018

18 ESTIO, 2015

19 IBID

20 IBID

21 ASRT, 2015

22 Radwan & Sakr, 2018

23 IBID

24 IBID

HUMAN CAPITAL / KNOWLEDGE ASSETS

STRENGTHS

A good active research base with high productivity

- Availability of more than 100,000 pieces of research, 50 universities, 120 research centres and a growing number of civil societies with a supportive role to science and technology.¹⁷
- The research community in Egypt is highly productive, as indicated by the number of publications produced and patents filed in the last ten years; during the period of 2005-2014, the total number of international publications by Egyptian researchers was 93,901, increasing from 4,781 in 2005 to 14,875 in 2014, with an annual growth rate of 4.21 per cent in 2014. This rate is exceeding the neighbouring countries except for Algeria and Israel.¹⁸
- Large number of qualified scholars in the diaspora; Egypt stands first within the neighbouring countries with almost 61,058 full-time equivalent researchers at the national level in 2015 (covering higher education, public, private and non-governmental organisations) with 55.9 per cent of the researchers having a doctoral qualification.¹⁹
- Active international mobility of young scholars; where the number of international scientific missions funded by the government reached 304 missions in 2014.²⁰

WEAKNESSES

Researchers' work is not always aligned with national need - and not productive enough

- The research community in public sector institutions is represented mainly by the higher education establishments (79.4 per cent) and public research institutions (21.6 per cent), while the private sector are only a small percentage.
 - A disparity between the overall number of researchers and overall productivity in research institutions; for example, the Agricultural Research Center in Egypt has a high number of researchers (10,200), yet only 1,491 researchers were active in the last five years by contributing to the production of 1,370 publications.²¹
 - Lack of effective mechanisms for empowering and engaging young scholars in policy planning, with a routine career path of researchers that is not incentivised enough with regard to excellence in science and technology and industry-oriented research.
- ### Misalignment between scientific productivity and industrial needs
- The educational system does not fully reflect industrial needs, especially in the manufacturing sector. As a consequence, postgraduates are struggling to fulfil the requirements for day-to-day private sector management practice.²²
 - Only 0.8 per cent of total scholarly outputs are based on corporate collaboration. In this respect, Egypt is outranked by Jordan, Saudi Arabia, and United Arab Emirates, in addition to African countries like Ethiopia, Congo and South Africa.²³
 - A low number of scientists in physics and mathematics when compared to other science disciplines, where only nine per cent of researchers are concentrated in engineering and science compared to 40 per cent in the medical field and 35 per cent in social science and humanities.²⁴

1.6 STRENGTHS AND WEAKNESSES ANALYSIS

BROADER ENVIRONMENT

STRENGTHS

Stable macroeconomic situation

- Egypt's macroeconomic situation has improved markedly since the initiation of the economic reform programme in November 2016.²⁵ In 2018, the real gross domestic product (GDP) grew by 5.3 per cent, compared to an average of 4.3 per cent in the three years before, driven mainly by public investments, private consumption, and exports of goods and services.²⁶
- There are promising stabilisation patterns, with annual inflation reaching its lowest rate in more than three years to register 9.4 per cent in July 2019, compared to 30 per cent in July 2017, along with the unprecedented decline in unemployment rates, which is an important stimulating factor for investment and entrepreneurship growth.

WEAKNESSES

Structural socio-economic problems

- Egypt's weak fiscal position and balance of payments structure highlight significant structural vulnerabilities that are expected to negatively affect upcoming growth prospects.²⁷
- The skill level of the labour market, female participation in the workforce, and the general attitude towards entrepreneurial risk are highlighted as key weakness indicators in the global competitiveness index (GCI, 2018). Furthermore, according to the World Bank indicators, the level of corruption and the burden of government regulation are two important factors that may be affecting the business environment in Egypt in the short term.

²⁵ IMF,2019

²⁶ World Bank,2019

²⁷ UN,2019

COUNTRY PROFILE

1.6 STRENGTHS AND WEAKNESSES ANALYSIS

28 MTI, 2016

29 IBID

30 GEM, 2017

31 ILO, 2017

32 SDS, 2016

33 FEI, 2019

ECOSYSTEM CONNECTIONS

STRENGTHS

Supportive entrepreneurship ecosystem

- Egypt is the fastest growing startup ecosystem and the second largest after the UAE, according to MAGNiTT's 2018 Mena Venture Investment Report.
- A growing number of initiatives and programmes that focus on raising scientific and innovation culture and the popularity of sciences. The list of initiatives includes: The Industrial Modernization Centre established in 2000; the four-year Industrial Development Strategy of 2016, the Rowad 2030 programme, public-private partnerships and technology alliances, like E-KTAs, Innovation Clusters Initiatives, etc.²⁸
- A growing number of technology enablers/actors in the innovation ecosystem including business competitions, science and technology parks, venture capitalists, incubators and specialised civil societies.²⁹
- The total early-stage entrepreneurial activity (TEA) rate in Egypt reached 13.3 per cent in 2017 compared to 12.3 per cent (world average).³⁰
- Existence of technology transfer and Intellectual property rights (IPR) offices at the majority of Egyptian universities.

WEAKNESSES

Lack of scaling up potential for startups

- 98 per cent of Egypt's firms are micro-enterprises, with a missing middle of the 'enterprises pyramid'.³¹
- There is limited coordination to support startups that exist as part of industrial value chains. Entities (like TTOs and TICOs) rarely communicate governmental and industrial needs in each sector to research institutions.
- A lack of trust between industry and academia, leading to low involvement of industry as a potential key driver to commercialise applied R&D outcomes.
- Micro and small companies' inability to produce and market innovation, which limits their ability to scale up in the market.³²

Informality trap

- The informal sector (businesses and workers that are not formally registered) represents more than 50 per cent of Egypt's economy, and that could be largely attributed to structural problems such as the low scale of formal jobs generation, and the level of bureaucracy involved in registration and taxation. At the same time, this represents a huge burden threatening fair competition in the market and hindering economic reform plans.³³

2.
**CAPACITY BUILDING FOR INNOVATION
IN EGYPT**

2.1 MAPPING INNOVATION POLICYMAKERS: ASSESSING THE SIZE OF THE CORE AUDIENCE

<http://www.asrt.sci.eg/index.php/asrt-organogram>
<http://www.stdf.eg:8080/web/page/64152>
http://www.ida.gov.eg/webcenter/portal/IDA/pages_board
<https://www.itida.gov.eg/English/Pages/OurTeam.aspx>
<http://portal.mohesr.gov.eg/ar-eg/Pages/Deputies-assistants.aspx>
<http://www.mti.gov.eg/English/aboutus/Sectorsandentities/Sectors/Pages/default.aspx>
<http://www.mcit.gov.eg/Biographies>
<https://www.tiec.gov.eg/English/Pages/OurTeam.aspx>
<https://www.gafi.gov.eg/english/AboutUs/Pages/default.aspx>
<https://www.cbe.org.eg/en/AboutCBE/Pages/SeniorManagement.aspx>
<https://www.gafi.gov.eg/english/AboutUs/Pages/default.aspx>

In the table below, we estimate the number of innovation policymakers at each seniority level within the government. However, it is important to note that the Egyptian Government comprises more than 5.5 million affiliated employees, many of whom are public school teachers (CAPMAS, 2017). Also, the figures in the table should be regarded as estimates only and not a precise indicator.

The numbers are drawn from publicly-available data on government employment, according to the organisation chart provided on the official websites of the main ministries and key institutions identified in the institutional map, combined with insights from expert interviews. For the institutions where no data were available, extrapolation was used assuming similar work structures across government agencies.

ESTIMATED CORE INNOVATION POLICYMAKERS PER LEVEL OF SENIORITY IN EGYPT			
	Level of Seniority	Institutions	Estimated Number
L1	Cabinet Members	MHESR, MCIT, MTI, MPMAR, MIIC, MSMEDA, CBE	10
L2	Top executive management at the key ministries and Coordinating Councils		45
L3	Director Generals of Key Institutions	STDF, ASRT, TIEC, ITIDA, ICTI, TICs, FEI, IDA, GAFI	18
L4	Deputy Director Generals and Directors of Key Institutions		149
Total	Total Core Innovation Policymakers		221

2.2 INNOVATION POLICYMAKER 'PERSONAS'



Head of Research & Innovation Management Department, Higher Education Institute

He has been with Agency X for nine years now. His main responsibilities include directing policy research and formulation with regard to science, technology and innovation, as well as supervising the National Science, Technology, and Innovation Policy Committee and subcommittees.

Prior to this, he was a lecturer at Z University while also working as an innovation consultant with international organisations. PhD in Biotechnology, Science and Technology Policy.

“The main strength points in the Egyptian innovation system are the availability of public funding allocated to science, technology and innovation, besides a good research base. That means both human and physical resources are available but the missing point is the managerial capability to absorb this funding effectively, and evidence-based, long-term planning, that can define clear areas of focus.”

“If there is a rich local database of subject-matter experts and policymakers in the field of innovation, we will have the capacity to overcome many of the challenges facing the innovation ecosystem in Egypt.”

“There are a number of projects and grants supporting science and innovation. However, there is missing long-term planning for the programmes that have been initiated.”

KEY INDIVIDUAL AND COLLECTIVE CHALLENGES

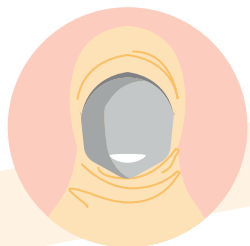
- Lack of accumulated knowledge and coordination between the key institutions influencing the innovation system;
- Availability of multiple projects and grants supporting science and innovation. However, long-term planning for the programmes initiated is missing;
- Lack of trained staff in key governmental institutions in areas related to science, technology and innovation such as technology management and public policy formulation and evaluation;
- Different parties, e.g. academia and industry, view innovation through different lenses and the need for a unified definition or scope for innovation which complicates communications.

ASPIRATIONS AND EXPECTATION FROM INTERNATIONAL TRAINING PROGRAMMES

- Forming an initial community of practitioners within the Egyptian Government to lead and champion innovation policy development;
- An opportunity for cross-cultural collaboration to boost the diversity of ideas in innovation policymaking;
- Replication of worldwide best practices in an evidence-based policy approach that uses data analytics and statistical tools to showcase realities.

CAPACITY BUILDING FOR INNOVATION IN EGYPT

2.2 INNOVATION POLICYMAKER 'PERSONAS'



Deputy Managing Director

She has been working with Agency X for five years. She has demonstrated experience in business development and marketing with a focus on introducing innovative products and services that could enhance a firm's positioning, and expand market share. She has held the position of a director and president of business development in more than one international institution and has a Bachelor's in Accounting and Business Administration.

"We need innovation policies to be focused on our major social challenges. A large segment of the labour market in Egypt is informal, which affects the enterprises' ability to innovate, expand or take advantage of the government offered benefits, thus addressing the informal labour market should be a priority to the policymakers."

"The educational system doesn't build calibres with the right mindset and culture to innovate; individuals end up being risk-averse and unaccepting of mistakes."

"Industry sector is not engaged enough in innovation policy planning and formulation; policies should focus on reducing the gap between academia and industry and encourage business investment in innovation."

"We need to strengthen innovation beyond apps and consumer market applications to tackle major social problems."

KEY INDIVIDUAL AND COLLECTIVE CHALLENGES

- Policies are not responding to market needs;
- Ease of doing business has improved; however, other business support services are still much lower than the market potential;
- Need for monitoring and evaluation systems on the national level to assess the impact of innovation-related projects. Such systems will help in documenting lessons learnt and scale up successful initiatives;
- Lack of public awareness on the importance of innovation;
- Innovation programmes are not properly advertised and target only a niche segment of the population.

ASPIRATIONS AND EXPECTATION FROM INTERNATIONAL TRAINING PROGRAMMES

- Integrating global best practices in practical policy incentives for business sector investment in research and development and how it can be customised to the local context;
- Being introduced to new approaches to handle organisational resistance to change and conflict resolution that may arise due to innovative projects;
- Focusing on change-making as an integral factor to be considered in designing policies;
- Latest global thinking and best practices in policy development and application in similar economies and the role of policymakers there.

2.2 INNOVATION POLICYMAKER 'PERSONAS'



Policy Advisor

He has been working for Ministry X as advisor to the minister for five years.

Prior to that he has worked as senior consultant on science, technology and innovation for institution X for seven years.

PhD in Innovation Management and Bachelor's degree in Engineering Automatic Control.

"The bureaucratic legislative chain is a barrier to innovation development; for policies to be actionable, they need to be translated in the form of enforced laws and regulations."

"Vision is teamplay but policymakers are isolated islands."

"Technology and innovation diffusion is an ongoing long process that entails cultural change and this process is beyond the capacity of individual ministries. A coordinating council is needed to consolidate the efforts in innovation."

"Egypt has rich resources presented in the large number of universities and research institutes, adequate funding bodies and supporting organisations."

"The law of 'Incentives for Science and Innovation' is a good step for academia and innovation linkage."

KEY INDIVIDUAL AND COLLECTIVE CHALLENGES

- There is a need for coordination among different research centres affiliated to different ministries;
- Universities and research centres need institutional frameworks and reward schemes for conducting industry-oriented research to be able to act as effective knowledge and technology transfer hubs;
- Policymakers need to be empowered and the process of policy impact assessment requires better management and enforcement.

ASPIRATIONS AND EXPECTATION FROM INTERNATIONAL TRAINING PROGRAMMES

- Being exposed to case studies of transition towards innovative societies highlighting lessons learned on macro and micro level;
- Inclusion of fundamental skills like scientific thinking, ideation, and innovation management in the process of policymaking.

3. ASSESSMENTS OF CURRENT AVAILABLE RANGE OF SUPPORT AND TRAINING FOR INNOVATION POLICYMAKERS IN EGYPT

ASSESSMENT OF LIKELY AREAS OF FOCUS FOR A GLOBAL INNOVATION POLICY ACCELERATOR TEAM FROM EGYPT

3.1 WORKSHOPS AND CERTIFICATION FOR CAPACITY BUILDING ON INNOVATION POLICY

Since the topic of innovation policy and innovation management is relatively new and has not been taught in the traditional educational programmes, there are a number of projects led by international development partners to current mid-level policymakers to enhance their knowledge in this niche field.

³⁴ The InnoAware Toolbox was developed based on the experience of the iN4iN Network <http://in4in.net/wp-content/uploads/2019/07/final-en-toolbox-24sep18.pdf>

³⁵ The Next Society <https://www.thenextsociety.co/advocacy-panel>

PRO-GRAMME	DESCRIPTION
Innovation Awareness Project (InnoAware)	<p>Within the context of the Egyptian Ministry of Trade and Industry (MTI) Industrial Innovation Strategy, the InnoAware toolbox and associated capacity-building programme were designed as part of the initial implementation of the strategy, which seeks to raise interest in innovation as a potential source of growth for SMEs. The strategy was developed by MTI with technical assistance provided by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development.</p> <p>The InnoAware tools were designed so that innovation experts can use them in three different environments: with companies, startups or higher education institutions. The main tools included the creation of innovation networks, creativity techniques, launching idea competitions, design thinking principles, and innovation readiness assessments.</p> <p>The capacity-building programme was conducted in two stages in the period of 2017-2018, and resulted in increasing the capacity of 30 innovation practitioners from three streams, i.e. business experts, entrepreneurs, and government officials.³⁴</p>
THE NEXT SOCIETY	<p>THE NEXT SOCIETY is a regional project launched in 2017 by ANIMA Investment Network and co-funded by the European Union, and includes the Information Technology Industry Development Agency (ITIDA) and the General Authority for Investment and Free Zones (GAFI) as local partners in Egypt. Part of the activities of this four-year project focus on (a) the capacity building of innovation policymakers and (b) improving policy frameworks in the seven Mediterranean country partners of the workshop, namely Algeria, Egypt, Jordan, Lebanon, Morocco, Palestine and Tunisia.</p> <ul style="list-style-type: none"> a The project implemented several country-level “advocacy panels” conducted as a one-day workshop. These panels brought together the main innovation stakeholders with the aim of strengthening the innovation system, fostering coordination among actors involved, and developing concrete instruments of the innovation policy. Thus it acts as a facilitator for public-private-academic dialogue and provides benchmarks and analyses, and opportunity to share experiences on innovation and competitiveness. b The Innovation and Competitiveness Monitoring activity aims at providing a set of decision-making tools to the Advocacy Panels’ members in order to support their pro-innovation advocacy. These tools aim to develop the innovation policymaking by providing country and sector-level analyses such as performance benchmarking, policy briefs and an observatory of companies’ practitioners.³⁵

ASSESSMENT OF LIKELY AREAS OF FOCUS FOR A GLOBAL INNOVATION POLICY ACCELERATOR TEAM FROM EGYPT

3.2 ADMINISTRATIVE REFORM AND GENERIC CAPACITY BUILDING

Other government-led capacity building programmes include the topic of innovation in their modules and training plans.

³⁶ AUC, 2019 retrieved from <https://in.aucegypt.edu/news/announcements/auc-launches-tripartite-leadership-government-excellence-program>

³⁷ National Training Academy, Presidential leadership program. Retrieved from <https://nta.eg/en/programs/presidential-leadership-programs/>

³⁸ AFDB, 2014. Retrieved from <https://projectsportal.afdb.org/dataportal/VProject/show/G-EG-KZ0-ZZZ-002>

PROGRAMME	DESCRIPTION
Leadership for Government Excellence	The Ministry of Planning, Monitoring and Administrative Reform (MPMAR), the American University in Cairo (AUC), and King's College London launched the 'Leadership for Government Excellence programme' in July 2019, which aims to increase competence-building and talent development in the public sector under the framework of Egypt's sustainable development strategy (Egypt vision 2030) and the administrative reform plan. Each cohort receives three months of training; two months at AUC, and one month at King's College on topics related to the study of the fundamentals of public policy, comparative government systems, the government in the age of machines, public sector management, effective communication, leadership, and institutional reform. Throughout the programme, participants work in groups on an innovative project that their ministries may implement in the New Capital. ³⁶
Executive Presidential Leadership Programme (EPLP)	The aim of the programme is to build the capacity of the country's promising cadres, with a focus on employees in the governmental sector, to become proficient in using modern methods in policymaking, management, and decision-making. The programme aspires to transform the traditional thinking prevailing in public administration to become more aligned with the latest international applications and models. ³⁷
Support to parliament: 'Building Capacity and Mainstreaming Inclusive Growth & Decentralisation'	The African Development Bank launched this project in 2014, with the objective of enhancing the performance of the Egyptian Parliament towards increased effectiveness in its accountability role. The project's direct beneficiaries were the parliament staff, with a special focus on members of parliament who work in the Parliament Committees alongside the elected Members of Parliament. ³⁸

ASSESSMENT OF LIKELY AREAS OF FOCUS FOR A GLOBAL INNOVATION POLICY ACCELERATOR TEAM FROM EGYPT

3.3 OTHER ACADEMIC PROGRAMMES

Some universities have recently started to grant degrees in fields related to innovation. However, these programmes are not focused on innovation policy per se.

³⁹ Source: <https://nu.edu.eg/>

⁴⁰ Source: http://www.guc.edu.eg/en/academic_programs/faculties/faculty_details.aspx?facultyId=5

PRO-GRAMME	DESCRIPTION
German University in Cairo (GUC)	<p>Nile University provides PhD and MSc degrees in the field of Management of Technology (MOT). The programme prepares professionals to integrate the knowledge of science, engineering, business and technology to master the process of guiding creativity, R&D activities, product development, commercialisation and the management of different technological resources for sustainable development.</p> <p>The courses offered stress the importance of understanding the accelerating rate of change, uncertainty and dynamics of the innovation process. They are designed to cover theoretical foundations and practical applications that equip students with the necessary skills related to managing technological resources at the macro-level of countries, as well as the micro-level of an organisation.³⁹</p>
Nile University	<p>The technology-based management programme offered by the GUC presents a combination of the business and technology skills required by the current labour market. It provides students not only with the general broad-based management knowledge but also with the technical knowledge needed to understand and manage organisations that compete in the high-technology industries, like developing knowledge and understanding of the foundation, techniques, limitations, recent developments and likely future trends in the following fields: communication technology, information technology, multimedia technology, computer-aided product design, modern manufacturing techniques, etc.⁴⁰</p>

**4.
ASSESSMENT OF LIKELY AREAS OF FOCUS
FOR A GLOBAL INNOVATION POLICY ACCELERATOR
TEAM FROM EGYPT**

ASSESSMENT OF LIKELY AREAS OF FOCUS FOR A GLOBAL INNOVATION POLICY ACCELERATOR TEAM FROM EGYPT

1. The Institutionalisation of the National Innovation Support Efforts

Designing different collaborative and knowledge-sharing mechanisms to align and coordinate the efforts of different ministries in their efforts to support innovation. These mechanisms can, for example, start by aligning the government efforts in:

- a technology and innovation commercialisation, and
- b incubation and acceleration services and associated funding. Those two areas are priorities given the variety of interventions related to them.

In this regard, the creation and activation of linkages to consolidate the efforts of relevant ministries (e.g. Ministry of High Education & Scientific Research, Ministry of Trade & Industry and Ministry of Investment & International Cooperation) is highly needed.

⁴¹ Innovation voucher schemes are usually 'lighter' and 'faster' both in application and reporting than standard grants and this makes them a tool particularly appealing to SMEs. Retrieved from <http://www.eciapplatform.eu/wp-content/uploads/2014/06/Thematic-paper-Innovation-vouchers-Milan.pdf>

2. Boosting Industry-Academia Collaboration

The new law of 'Incentives to Science, Technology, and Innovation' that allows universities to spin-off companies based on their research output, and in which the private sector can invest, provides an opportunity to bridge the longstanding gap between industry and academia in Egypt. From one side, it incentivises businesses to invest in research and development (R&D); and on the other side, it encourages academia to conduct research meeting industry's needs.

Accordingly, an intervention is needed to:

- a formulate regulations to put this law into action,
- b design reward schemes that encourage academics to work with businesses to develop demand-driven innovation, and
- c deploy flexible policy instruments such as innovation vouchers⁴¹ and tax exemptions to encourage startups and SMEs to invest in innovation.

3. Promoting Innovation and Entrepreneurship in Technical Universities

Devising mechanisms to promote innovation and entrepreneurship and integrate the industry and market needs in the newly established Technical Universities curricula on an ongoing basis.

This includes equipping the students with the knowledge and skills required to readily join the job market or pursue self-employment, in collaboration with the private sector and relevant ministries, starting with areas where Egypt possesses a competitive advantage such as tourism technologies, textile, renewable energy, and food industries.

4. Putting Article #23 into effect and working towards allocating 1% of Egypt's GDP on scientific research

Drafting policy papers to actively enforce article #23 of the 2014 Constitution which sets a target for the Gross Expenditure on Research and Development (GERD) at one per cent of GDP. This will result in a thorough review of existing laws and regulations and, therefore, their enforcement or amendment whenever needed.

Such activity can be complemented by a rigorous monitoring and evaluation mechanism whose responsibility will be distributed among relevant ministries.

5. Implementation of the Knowledge, Innovation & Scientific Research Pillar of 'Egypt Vision 2030'

Designing a mechanism to coordinate the relevant ministries' efforts to achieve and monitor the realisation of the Knowledge, Innovation & Scientific Research Pillar of the Sustainable Development Strategy 'Vision 2030'.

An inter-ministerial innovation coordinating unit could be formulated to provide a clear innovation roadmap inside every ministry and be responsible for monitoring and evaluating government efforts in innovation.

The monitoring and evaluation activities of this unit could focus on:

- 1 improving Egypt's overall rank in one of the global indices mentioned in the Vision (e.g. Global Innovation Index, Innovation Efficiency, or Companies Innovation Capacity Index), or
- 2 assessing the impact of the implemented measures of the Vision 2030 (e.g. the planned legal reforms related to knowledge and innovation, the development and restructuring of the knowledge and innovation system, promoting innovation and knowledge culture, the stimulation of innovation activities in SMEs, and the activation of public-private partnership to support and stimulate innovation.)

6. Development of Science & Technology Parks

Designing a mechanism to activate and leverage the current science and technology parks through providing adequate infrastructure, support services, and educated and trained individuals via a collaboration of universities and research institutions, the private sector, and different ministries. This needs to account for location specificities, for instance, through the provision of relevant management (e.g. innovation management, technology management, entrepreneurship etc.) and technical (e.g. specialities of national focus) degrees in nearby universities to combat the centralisation of talents in major cities.

**5.
DIAGNOSIS AND
RECOMMENDATIONS**

DIAGNOSIS AND RECOMMENDATIONS

It is evident that Egypt has the necessary institutional requirements for a rich national innovation system, i.e. a large number of universities and research institutes, adequate funding bodies, and supporting organisations for innovation and entrepreneurship. Moreover, the political leadership identifies innovation as a core pillar in the development of the country and its transition to a knowledge-based economy, as demonstrated in Egypt Vision 2030, the constitutional reforms in 2014, and the recent laws to incentivise investment in R&D and encourage industry-academia collaboration.

However, the national innovation system still needs major developments to reach its full potential and overcome the following challenges:

- **Efforts are fragmented and there is a lack of coordination among key actors influencing the science, technology and innovation system;**
- **The non-alignment of the definition and scope and expected outcomes from investing in innovation has made innovation policy interventions difficult to prioritise, plan, coordinate and assess;**
- **The gap between research and industry needs, where more rewarding schemes are required to encourage both sides to engage in projects leading to market-driven innovations;**
- **A lack of monitoring and evaluation systems to assess the impact of different innovation support programmes and clearly identify priority areas for relevant ministries, agencies, and funding bodies to focus on in alignment with the goals of Egypt Vision 2030.**

A number of initiatives have focused on overcoming some of these challenges. However, the impact of these initiatives is not clearly documented and publicly available, and this is a paramount factor that shall be taken into consideration in the Global Innovation Policy Accelerator (GIPA) training for policymakers.

DIAGNOSIS AND RECOMMENDATIONS

To ensure the successful implementation of the Global Innovation Policy Accelerator, the following recommendations were collected from the research, as well as insights from policymakers and key subject-matter experts:

1. Participant selection

Most senior and mid-level civil servants in the innovation field in Egypt play jointly and simultaneously an executive and policymaking role as per their position mandates. Therefore, the selection process needs to consider including participants with adequate understanding and experience of policymaking, in addition to enough decision power and capacity for resources mobilisation. These set of criteria could significantly contribute to the ease of the implementation of the selected project, given the dual executive and policy roles played by those government officials. Moreover, personality traits such as risk appetite, flexibility, and conflict management styles, as well as the complementary skills of the team when it comes to innovation management and policy formulation are crucial success factors. On the other hand, while GIPA design involves the inclusion of only policymakers and civil servants, many interviewees expressed the high importance of including other stakeholders such as legislators, academics, civil society representatives, and industry personnel, to ensure the relevance, applicability, and effectiveness of the resulting policy. This could be compensated for during the implementation phase where the team can seek the input of such stakeholders on their project prototype.

2. Themes of interest for capacity building

Most interviewees expressed the need for new approaches of problem-solving, design thinking, and monitoring and evaluation, as well as ways to manage resistance to change within their institutions and resolve conflicts should they arise during the project implementation. The applicability of the latest global thinking and best practices in innovation and knowledge development to the local context was also a concern that many interviewees shared and identified as a critical success factor that most capacity-building programmes tend to overlook. Finally, other topics of interest included technology and innovation management, evidence-based policies planning, and the participatory approach of decision-making.

3. Programme implementation methodology

In sharing best practices applied in other countries, it is important to highlight the role played by the participants' counterparts in these countries, and to give them the space to derive the lessons learned and plan for the customisation of relevant practices to the local context. Also, the impact assessment of their project of choice should be considered during the design and planning phases, to allow for informed interactions during the prototyping phase and ensure subsequent success. Finally, ways to engage other officials up and down the hierarchy of the attendees (i.e. ministers and subordinates) during the nine months of the programme need to be considered to maintain the momentum following the training visits to London.

6.
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Global
Innovation
Policy
Accelerator