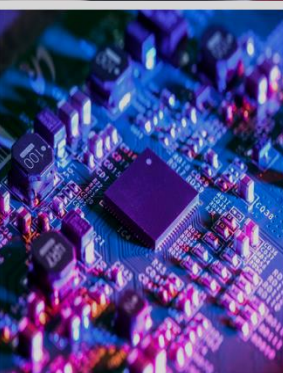
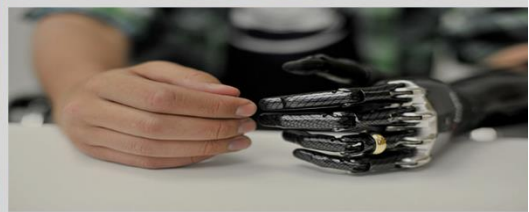
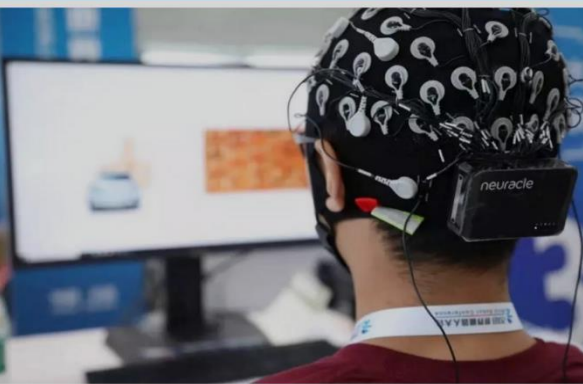




# ALGERIA

## STI Profile of the OIC Member State

### Science, Technology and Innovation Indicators



**COMSTech**

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# FOREWORD

It gives me great pleasure to share the *Science, Technology and Innovation Profiles of OIC Member States*, as prepared by COMSTECH. These profiles of member states are being printed, as well as shared on the COMSTECH website. A few words are therefore presented to explain the wider aims and purposes of this exercise.

The member countries of the OIC are vigorously engaged with science, technology and innovation, both as a pursuit of knowledge and in harnessing the forces of nature for human betterment. Depending on their circumstances they have advanced to different levels, but much needs to be done, in general, to catch up with the attainments of the more advanced countries. However, there exists a well-defined need to catalogue national efforts in this direction. In particular, to identify respective strengths, achievements and shortcomings, as well as the institutions and policies that are shaping the scientific research and development profiles of OIC member states.

It is with the above goals and purposes that COMSTECH has ventured on this ambitious task viz. preparing a summarized version of the science, technology and innovation landscape of each member state. We have initiated this effort starting with the profiles of countries leading in this area, and will be continuing and sharing as we proceed onwards.

Undoubtedly much more could be said about each country than the summary that we have presented, but our emphasis is on the essentials and on maintaining brevity. COMSTECH welcomes feedback from member states on this effort and will be happy to update the website profiles on the basis of information received officially.

I hope that the scientific community as well as the planners and administrators of member states will find these profiles both useful and inspiring.

Prof. Dr. M. Iqbal Choudhary  
*Coordinator General COMSTECH*  
*UNESCO Chair*

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# ALGERIA

, officially the People's Democratic Republic of Algeria, is a country in North

Africa. Algeria is bordered to the northeast by Tunisia; to the east by Libya; to the southeast by Niger; to the southwest by Mali, Mauritania, and Western Sahara; to the west by Morocco; and to the north by the Mediterranean Sea. It is considered to be a part of the Maghreb region of North Africa. It has a semi-arid geography, with most of the population living in the fertile north and the Sahara dominating the geography of the south. Algeria covers an area of 2,381,741 square kilometres (919,595 sq mi), making it the world's tenth largest nation by area, and the largest nation in Africa. With a population of 44 million, Algeria is the ninth-most populous country in Africa, and the 32<sup>nd</sup> most populous country in the world. The capital and largest city is Algiers, located in the far north on the Mediterranean coast.



Algeria produced and is linked to many civilizations, empires and dynasties, including ancient Numidians, Phoenicians, Carthaginians, Romans, Vandals, Byzantines, Umayyads, Abbasids, Rustamids, Idrisids, Aghlabids, Fatimids, Zirids, Hammadids, Almoravids, Almohads, Zayyanids, Spaniards, Ottomans and the French colonial empire. The vast majority of Algeria's population is Arab-Berber, practicing Islam, and using the official languages of Arabic and Berber. However, French serves as an administrative and educational language in some contexts. The main spoken language is Algerian Arabic.

## ALGERIA

Algeria is a semi-presidential republic, with local constituencies consisting of 58 provinces and 1,541 communes. It has the highest Human Development Index of all non-island African countries and one of the largest economies on the continent, based largely on energy exports. Algeria has the world's sixteenth-largest oil reserves and the ninth-largest reserves of natural gas. It is also a large supplier of natural gas to Europe. It is a member of the African Union, the Arab League, the OIC, OPEC, the United Nations, and the Arab Maghreb Union, of which it is a founding member.

Source: <https://en.wikipedia.org/wiki/Algeria>



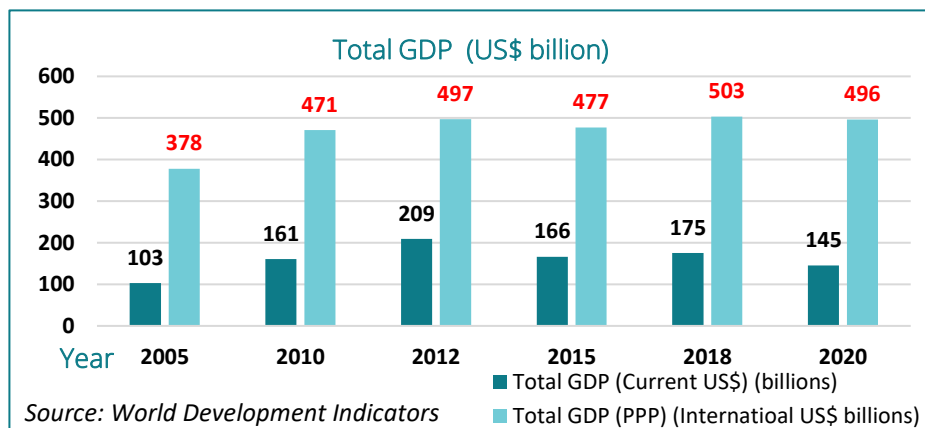


## A. ECONOMIC OVERVIEW

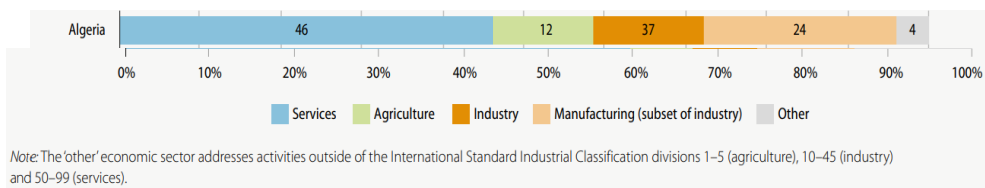
- ❖ Algeria is the world's sixth-largest gas exporter. Hydrocarbons were responsible for 19.7% of GDP in 2017 and an estimated 40% of the public budget in 2018. In 2015, the government instituted a five-year investment plan which identified the following priority industries: manufacturing; iron and steel; mechanical and metals; electrical and electronics; agribusiness; chemicals; plastics and pharmaceuticals; and construction materials. Thanks to strong hydrocarbon revenues, Algeria has a cushion of \$173 billion in foreign currency reserves and a large hydrocarbon stabilisation fund. In addition, Algeria's external debt is extremely low at about 2% of GDP. Algeria has not joined the WTO, despite several years of negotiations but is a member of the Greater Arab Free Trade Area and the African Continental Free Trade Area, and has an association agreement with the European Union. Turkish direct investments have accelerated in Algeria, with total value reaching \$5 billion.
- ❖ The non-oil economy grew by 2–3% each year over 2016–2019 (World Bank, 2020). Agro-industry is Algeria's most developed industrial segment, accounting for 38% of industrial value added in 2017. In the same year, 716 new agro-industrial investment projects were established. Cement is one of the fastest-growing segments; in 2018, output surpassed domestic demand for the first time. Like other countries, the COVID-19 pandemic depressed the Algerian economy in 2020. Real GDP growth is estimated to have contracted

by 5.5% amid strict lockdown measures to contain COVID-19 and a concurrent fall in hydrocarbon production.

Source: <https://en.wikipedia.org/wiki/Algeria>



### ❖ GDP per economic sector in Algeria, 2019



The service sector accounts for little under half of Algeria's total economic activity while Industry and agriculture constitute the remaining next large sectors with 37 and 12% percentage shares respectively. Manufacturing, as a part of industry, constitutes 24% of the national economy.

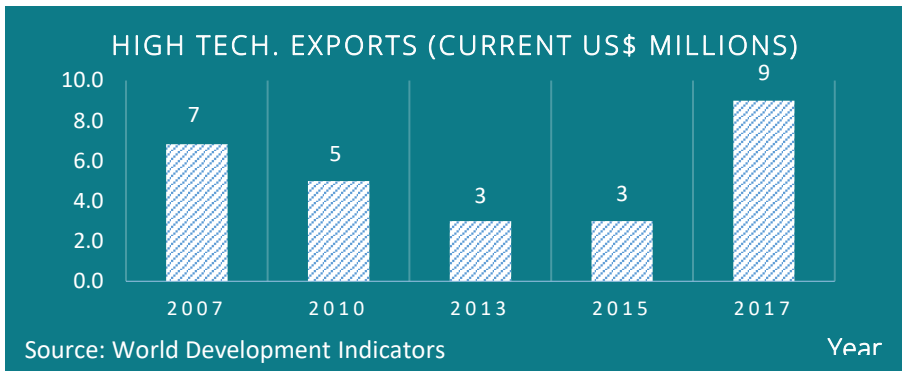
Source: UNESCO Science Report 2021

### ❖ Selected economic indicators for Algeria, 2012-2019

|         | Average GDP growth rate (%) |           | GDP per capita (constant 2017 PPP\$) | Average FDI inflows as a share of GDP (%) |           | High-tech exports as share of manufactured exports (%) | Unemployment rate (%) | Youth unemployment rate (%) |
|---------|-----------------------------|-----------|--------------------------------------|---|-----------|--|-----------------------|-----------------------------|
|         | 2012–2015                   | 2016–2019 | 2019                                 | 2012–2015                                 | 2016–2019 | 2018   | 2019                  | 2019                        |
| Algeria | 3.42                        | 1.67      | 11 350                               | 0.48                                      | 0.85      | 0.6 <sup>1</sup>                                       | 11.7                  | 29.5                        |

Source: UNESCO Science Report 2021

- ❖ Algeria's average annual growth rate was 3.42% in the 2012-2015 period which slowed down to 1.67% in the years 2016-2019. The per capita GDP in 2019 was US\$11350.
- ❖ Algeria's high tech exports were a modest US\$9 million in 2017 and have not shown any systematic growth over the past 15 years.





## B. SOCIAL AND HUMAN DEVELOPMENT

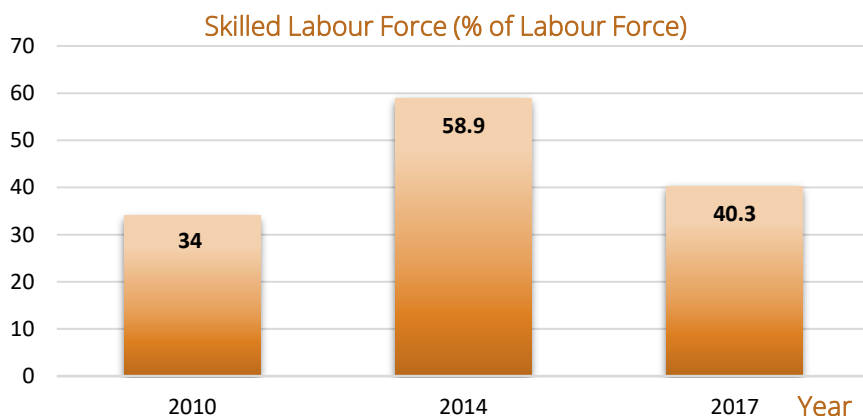
❖ **The following are some of Algeria's key social indicators:**

|  |               |
|--|---------------|
| Life expectancy at birth, total (years)                    | 76.88 (2019)  |
| Literacy rate, adult total (% of people ages 15 and above) | 81.41 (2018)  |
| Mortality rate, infant, male (per 1,000 live births)       | 20.7 (2020)   |
| Mortality rate, infant, female (per 1,000 live births)     | 18.1 (2020)   |
| Individuals using the Internet (% of population)           | 57.5 (2019)   |
| Mobile cellular subscriptions (per 100 people)             | 103.88 (2020) |

❖ In the past two decades, the hydrocarbon boom has allowed Algeria to make advances in economic and human development. The country has introduced redistributive social policies that alleviated poverty and resulted in large improvements in Human Development Indicators. Algeria's 2019 rating in the UNDP's Human Development Index (HDI) has increased with a current index value of 0.748, which indicates a high level of human development. Algeria is currently ranked 91 out of 189 countries and has generally recorded improvement in this regard.

- ❖ Algeria is considered to have achieved universal primary education, with a 97% primary net enrollment rate in 2015 (with gender parity) and has lifted higher education enrollment rates. The infant mortality rates have decreased slightly while access to the internet now exceeds over 57% of the population. Mobile cellular subscriptions also show very common usage.

Source: World Bank: <https://www.worldbank.org/en/country/algeria/overview>



Source: Human Development Report: <http://www.hdr.undp.org/en/indicators/179406>

- ❖ Algeria's skilled labour force increased very strongly between 2010 and 2014 but has seen a significant decline in the 2014-2017 period. However, there is still an overall positive trend in the last 7 years on record.





## C. KEY GOVERNMENT ORGANIZATIONS RELATED TO SCIENCE, TECHNOLOGY AND HIGHER EDUCATION

### ❖ **Algerian Academy of Sciences and Technology (AAST):**

The Algerian Academy of Science and Technology (AAST) was established by Presidential Decree in March 2015. AAST is a national independent institution, provided recently for by the constitution of the People's Democratic Republic of Algeria. The Academy is currently composed of its 46 founding members spread over two divisions (science and technology). According to its statutes, the AAST advises decision-makers in the field of its expertise, contributes to the progress of science and technology as well as their applications and promotes national and international collaborations. The Algerian Academy is in charge of the development of science and technology for education at all levels, together with the introduction of scientific culture to the society. The AAST supports and encourages the production of knowledge in general.

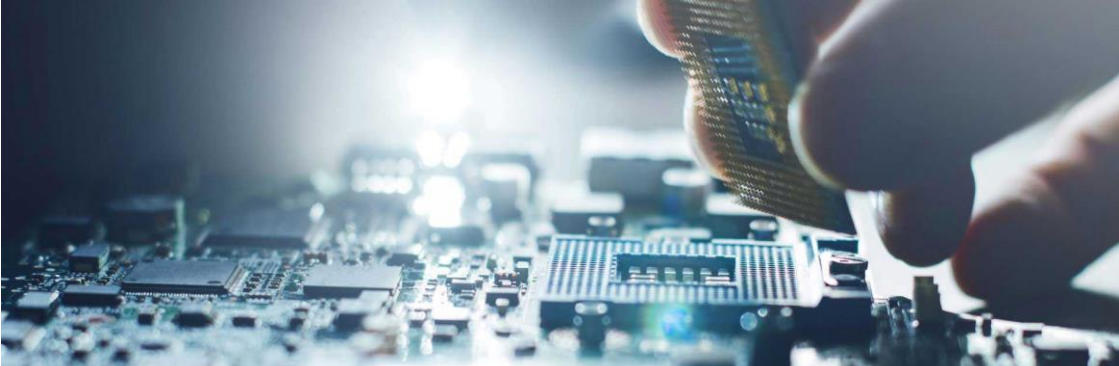
Source: <http://www.aast.dz/>

### ❖ **Ministry of Higher Education and Scientific Research**

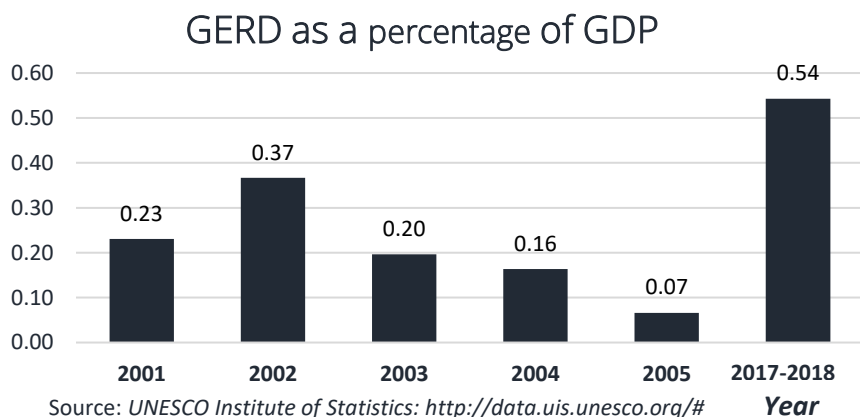
### ❖ **The Ministry of Post, Telecommunications, and Digital Technologies**

### ❖ **The Directorate-General for Scientific Research and Technological Development**, which operates under the authority of the Minister for Scientific Research, defines and funds the five-year National Priority Research Programme.





## D. RESEARCH AND DEVELOPMENT



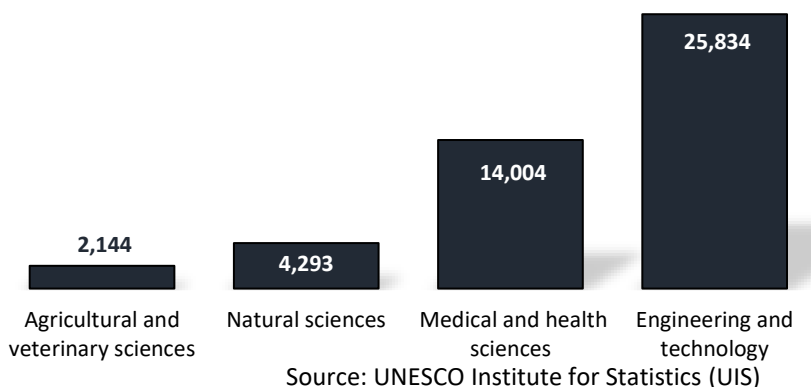
- ❖ Algeria's Gross expenditure on Research and Development (GERD) has increased to 0.54% of GDP between 2005 and 2017. It has remained at the same level (0.54) in 2018. Over the 2007 to 2018 period its average was about 0.3%. The current level of GERD as a percentage of GDP places Algeria among the top ten OIC countries. The global average for this parameter however was 1.79% in 2018.

### ❖ Researcher Intensity:

The number of Full time equivalent (FTE) researchers per million population for Algeria in 2017 was reported to be 819, while the global average for this parameter in 2018 was 1368. For the same

year Algeria had a technician intensity of 42 per million, whereas the global average was 311 technicians per million. While this number of researchers has increased very significantly since 2005, it still needs improvement to come close to the global average. Female researchers accounted for about 47% of all researchers in the same year.

### ❖ **Researchers distribution by major fields (HC):**



The bulk of Algerian researchers are engaged in the fields of engineering and technology (25,834) while medicine and health research has the next higher number of researchers (14,005). Natural sciences and agriculture research have significantly lower participation.

- ❖ Research projects initiated by foreign firms and involving local universities are emerging in both the agrifood and cement industries. For instance, since 2013, the R&D unit of the giant cement producer Lafarge has worked with local development laboratories (centres de développement locaux) in various parts of the country to develop new product applications, construction systems and building methods, using local building materials. These projects tend to hire local researchers.

*Source: UNESCO Science Report 2021*

## ❖ Researchers (FTE) by sector of employment in Algeria, 2017

| # | Fields                               | BUSINESS ENTERPRISE (2017) | GOVERNMENT (2017) | HIGHER EDUCATION (2017) | TOTAL         |
|---|--------------------------------------|----------------------------|-------------------|-------------------------|---------------|
| 1 | Natural sciences                     | 31                         | 318               | 3,944                   | 4,293         |
| 2 | Engineering and technology           | 70                         | 1,414             | 24,350                  | 25,834        |
| 3 | Agricultural and veterinary sciences | -                          | -                 | 2,144                   | 2,144         |
| 4 | Medical and health sciences          | 5                          | -                 | 13,999                  | 14,004        |
|   | <b>TOTAL</b>                         | <b>106</b>                 | <b>1,732</b>      | <b>44,437</b>           | <b>46,275</b> |

- ❖ It is clear from the above table that the overwhelming number of Algerian researchers are employed by the higher education sector while a small percentage is employed by the government and there is almost negligible role of business enterprises in hiring researchers.

## ❖ R&D Institutions and Policies:

- The Directorate-General for Scientific Research and Technological Development, which operates under the authority of the Minister for Scientific Research, defines and funds the five-year National Priority Research Programme. The most recent of these covers the 2018–2023 period (Figure 17.6). It identifies the following priority research areas, which were first outlined in an inter-ministerial decision of 27 June 2016:
  - renewable energy;
  - biotechnology;
  - materials science; and
  - environmental sciences.

- April 2020 saw the inauguration of the new Council of Scientific and Technological Research. It comprises 45 members appointed by the president. The council will determine major directions for science policy, evaluate existing policies and help integrate STI into the country's socio-economic development. It is also tasked with evaluating the results of R&D (APS, 2020).
- In February 2020, the new Government Action Plan was submitted to parliament; it targets among other things training programmes to meet labour market needs and the development of capacities in renewable energy, among other things. The plan also acknowledges the need to develop capacities in science and technology, in order to build a knowledge economy. The Action Plan sets the target of developing capacity in renewables to produce 15 GW of electricity by 2035.
- Five of Algeria's research centers are among the top 50 in Africa. The Ministry of Higher Education counts 12 research centers, 12 research units and six research agencies within its remit. Algeria also has a number of exchange agreements with international universities, with student exchange programs for doctoral research in Europe and elsewhere.

#### ❖ **Leading Research Centers of Algeria:**

- Research Centre for Scientific and Technical Information
- Renewable Energy Development Centre
- Centre for Development of Advanced Technologies
- Centre of Research in Astronomy, Astrophysics, and Geophysics
- Scientific and Technical Research Centre on Arid Regions (CRSTRA)
- National Centre of Research in Social and Cultural Anthropology
- Research Centre in Industrial Technologies CRTI

- National Centre for Biotechnology Research Algeria
  - National Centre for Applied Research in Earthquake Engineering
- Source: Ranking web of Research Centres, Annual 2019 Edition.



### ❖ **Emphasis on Renewable Energies:**

- Algeria is diversifying its energy mix. Sixty solar and wind projects have been approved within the country's Renewable Energy and Energy Efficiency Programme, which was adopted in March 2011 and revised in 2015. The aim is for 40% of electricity for national consumption to be produced using renewable energy sources by 2030. Up to 22 000 MW of power-generating capacity from renewable sources will be installed between 2011 and 2030, 12 000 MW to meet domestic demand and 10 000 MW destined for export. In July 2013, Algeria signed a memorandum of understanding with the EU in the field of energy which includes provisions for the transfer of technology to Algeria for both fossil fuels and renewable energy.

- Algeria's Centre for the Development of Renewable Energies conducts R&D programmes on energetic systems using solar, geothermal and biomass energy. Half of the patents filed by research centres are made by this centre.
- The government announced plans in May 2020 to develop 4 GW of solar photovoltaic capacity by 2024, under the Tafouk 1 project. This project will see the construction of solar plants in more than ten provinces (wilayas), covering a total area of around 6 400 ha, for a total cost of US\$ 3.2–3.6 billion. Algeria currently benefits from some 20 solar power plants installed in the Sahara and highlands.



# E. HIGHER EDUCATION

❖ Following is the list of national and global ranking of leading Algerian universities:

| <i>University Name</i>   | <i>National Ranking</i> | <i>Global Ranking</i> |
|--|-------------------------|-----------------------|
| <i>University Of Science And Technology Houari Boumediene</i>            | 1                       | 2156                  |
| <i>The Université Constantine 1, formerly the University of Mentouri</i> | 2                       | 2306                  |
| <i>The University of Abou Bakr Belkaid</i>                               | 3                       | 2394                  |
| <i>University of M'sila - Mohamed Boudiaf</i>                            | 4                       | 2478                  |
| <i>University of Oran 1 Ahmed Ben Bella</i>                              | 5                       | 2654                  |
| <i>Ferhat Abbas University Setif</i>                                     | 6                       | 2751                  |
| <i>University Djillali liabes of Sidi Bel Abbas</i>                      | 7                       | 2777                  |
| <i>University of Bejaia</i>  | 8                       | 2796                  |
| <i>The University of Mohamed Khider Biskra</i>                           | 9                       | 2819                  |
| <i>Badji Mokhtar - Annaba University</i>                                 | 10                      | 3141                  |

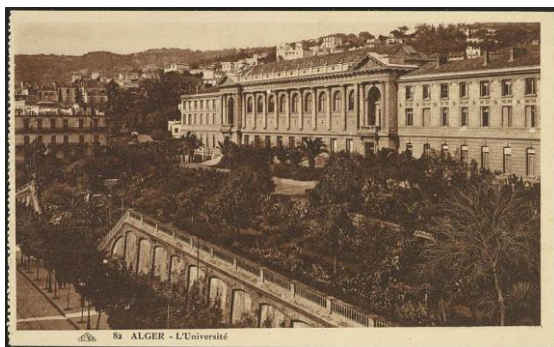
Source: <https://www.webometrics.info/en/aw/Algeria>





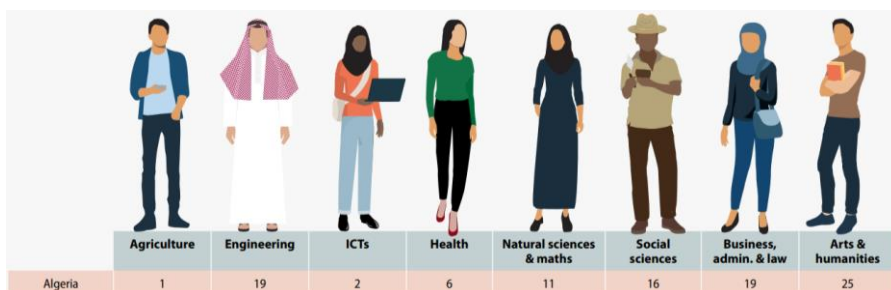


- ❖ Besides the above, **The University of Algiers** commonly called the Algiers 1 University, located in Algiers, is the oldest and most prestigious university in Algeria. Emerging from a series of independent institutions in the 19th century, it was organized as a university in 1909 and profoundly reorganized in 2009.



- ❖ There are an estimated 130 universities and colleges under the authority of the Ministry of Higher Education and Scientific Research in Algeria. To date (2019) the Algerian higher education system features more than 1.5 million students, out of whom about 300,000 are pursuing a Master's degree and about 55,000 are registered as doctoral candidates.

### ❖ **Distribution of students in Algeria by programme, 2018 or closest year (%)**



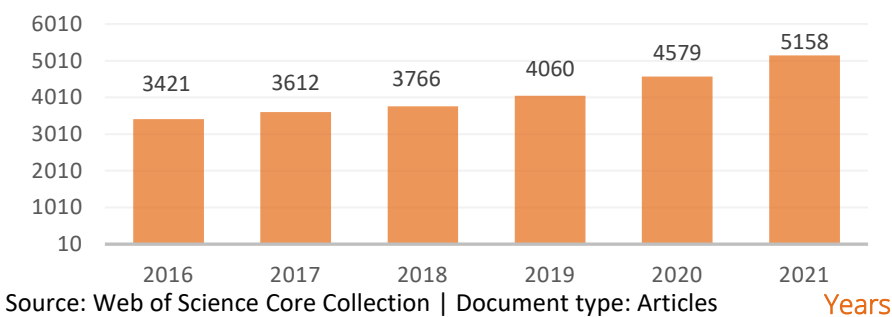
Source: UNESCO Science Report 2021

Engineering students constitute 19%, while natural sciences and mathematics and ICT combine to contribute about 13% percent to the total number of higher education students.



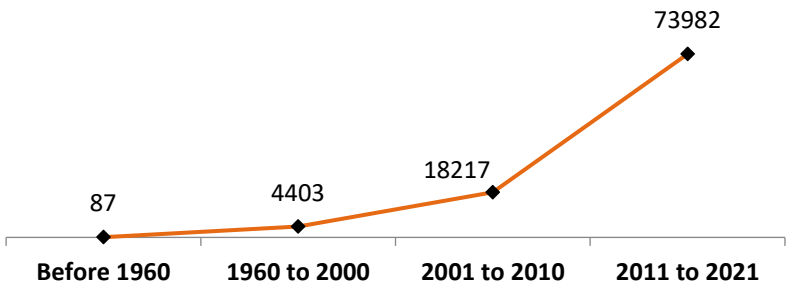
# F. RESEARCH PUBLICATIONS

Research Publications (Science and Technology)



- ❖ The number of science and technology publications has increased by 50% in the past five years showing a steady increase. The number of publications per million inhabitants for Algeria was 179 in 2019 which is on the lower side compared to most other larger Arab countries.

Total Scientific Publications = 96689



❖ As shown in the accompanying figure, Algeria had published only 87 documents before 1960. While the total publications between 1960 and 2021 are 96689. These includes all types of documents for example articles, reviews, notes, book chapters, and conference papers, etc. It is important to note that 78.80 % (or 70397) documents are published in the last decade (from 2012 to 2021). All documents received 637316 citations or 9.1 **citations per publications (CPP)**. Another important quality indicator is **field weighted citation impact (FWCI)**, which “indicates how the number of citations received by an article compares to the average or expected number of citations received by other similar publications”. For Algeria the FWCI is 0.90, which means, that the articles received 10% lower citations as compared with global average. The per year (from 2012 to 2021) **scholarly output (SO)**, citations, FWCI and CPP is present in the table given below.

| S# | Title     | Overall | 2012  | 2013  | 2014  | 2015  | 2016  | 2017  | 2018  | 2019  | 2020  | 2021  |
|----|-----------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1  | SO        | 70397   | 4379  | 5044  | 5402  | 6136  | 6841  | 7446  | 8093  | 8740  | 8391  | 9925  |
| 2  | Citations | 637316  | 51086 | 58798 | 60409 | 67150 | 90937 | 95766 | 82726 | 59666 | 47458 | 23320 |
| 3  | FWCI      | 0.9     | 0.69  | 0.72  | 0.72  | 0.75  | 1.04  | 1.09  | 0.95  | 0.86  | 0.96  | 1.01  |
| 4  | CPP       | 9.1     | 11.7  | 11.7  | 11.2  | 10.9  | 13.3  | 12.9  | 10.2  | 6.8   | 5.7   | 2.3   |

❖ The details of the publications in different subject areas are provided in the subsequent table. Algeria has published the highest number of publications in Engineering (n= 25201), followed by Computer Science (n= 16499), and Physics and Astronomy (n= 13066). The highest citations were noted for Engineering (n= 204917), Physics and Astronomy (n= 119179) and Materials Science (n= 115791). However the highest CPP was recorded for Medicine (n= 25.4), Immunology and Microbiology (n= 14.5) and Neuroscience (n=13.5). In the same vein, highest FWCI was found for Medicine (n=2.31), Psychology (n=1.76) and Economics, Econometrics and Finance (n=1.1). The details for all 27 subjects' areas for the period 2012-2021 are presented in table.

| S# | Subject Area                                 | SO    | Citations | Authors* | CPP  | FWCI |
|----|--|-------|-----------|----------|------|------|
| 1  | Engineering                                  | 25201 | 204917    | 22186    | 8.1  | 0.94 |
| 2  | Computer Science                             | 16499 | 96987     | 13417    | 5.9  | 0.81 |
| 3  | Physics and Astronomy                        | 13066 | 119179    | 12916    | 9.1  | 0.83 |
| 4  | Mathematics                                  | 11700 | 66260     | 10475    | 5.7  | 0.9  |
| 5  | Materials Science                            | 11337 | 115791    | 12201    | 10.2 | 0.83 |
| 6  | Chemistry                                    | 6935  | 77108     | 8796     | 11.1 | 0.76 |
| 7  | Energy                                       | 6444  | 68631     | 8229     | 10.7 | 0.97 |
| 8  | Environmental Science                        | 5999  | 50637     | 9341     | 8.4  | 0.73 |
| 9  | Agricultural and Biological Sciences         | 5417  | 41404     | 8309     | 7.6  | 0.68 |
| 10 | Medicine                                     | 4350  | 110309    | 7624     | 25.4 | 2.31 |
| 11 | Chemical Engineering                         | 4043  | 47845     | 6244     | 11.8 | 0.88 |
| 12 | Biochemistry, Genetics and Molecular Biology | 3515  | 42586     | 6352     | 12.1 | 0.82 |
| 13 | Earth and Planetary Sciences                 | 3329  | 36310     | 4743     | 10.9 | 0.91 |
| 14 | Social Sciences                              | 2340  | 9032      | 3503     | 3.9  | 0.65 |
| 15 | Decision Sciences                            | 2062  | 8854      | 3219     | 4.3  | 0.8  |
| 16 | Pharmacology, Toxicology and Pharmaceutics   | 1957  | 16509     | 3591     | 8.4  | 0.68 |
| 17 | Immunology and Microbiology                  | 1225  | 17808     | 2280     | 14.5 | 0.99 |
| 18 | Business, Management and Accounting          | 994   | 5240      | 1598     | 5.3  | 0.69 |
| 19 | Arts and Humanities                          | 717   | 1802      | 847      | 2.5  | 0.53 |
| 20 | Multidisciplinary                            | 705   | 7931      | 1544     | 11.2 | 0.71 |
| 21 | Veterinary                                   | 580   | 3981      | 1063     | 6.9  | 0.98 |
| 22 | Economics, Econometrics and Finance          | 460   | 4013      | 784      | 8.7  | 1.1  |
| 23 | Nursing                                      | 227   | 1505      | 574      | 6.6  | 0.63 |
| 24 | Neuroscience                                 | 217   | 2935      | 437      | 13.5 | 0.95 |
| 25 | Health Professions                           | 176   | 1297      | 400      | 7.4  | 0.7  |
| 26 | Psychology                                   | 112   | 1277      | 130      | 11.4 | 1.76 |
| 27 | Dentistry                                    | 21    | 90        | 61       | 4.3  | 0.32 |

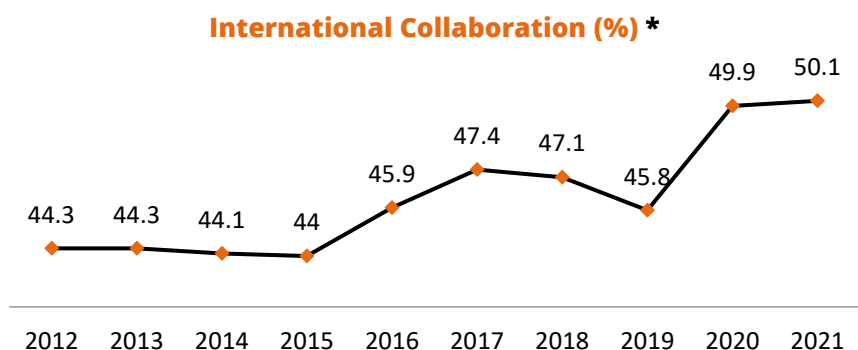
\* Total number of contributing authors.

- ❖ One of the principal indicators to describe the quality of publications is the journal "impact factor" or "citescore". Scopus has ranked all sources or journals in seven different quartiles or categories i.e. from Q1 to Q7 in terms of their respective citescores. For example, the Q1 group includes publications within the top 1% range of citescores, while the Q6 group e.g. includes all the publications within the top 75% range of cite scores, respectively. While Algeria has a total of 70397 published items between 2012 and 2021, a total of 56515 publications of these lie within the seven quartiles groups. In other words, the remaining 13882 (or 19.7%) published items sources do not have citescore data. The highest number of documents are published in Q5 group (16823/29.8%) and Q6 (15129/26.8%). The per year distribution of publications in all seven quartile sets are presented in table given below.

| 5# | Title                        | Overall | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|----|------------------------------|---------|------|------|------|------|------|------|------|------|------|------|
| 1  | Pub in top 1% Sources (Q1)   | 420     | 18   | 23   | 25   | 23   | 60   | 49   | 44   | 44   | 30   | 104  |
| 2  | Pub in top 1% (Percent)      | 0.7     | 0.6  | 0.6  | 0.6  | 0.5  | 1.1  | 0.8  | 0.7  | 0.6  | 0.4  | 1.2  |
| 3  | Pub in top 5% Sources (Q2)   | 2802    | 155  | 175  | 258  | 226  | 276  | 263  | 305  | 280  | 370  | 494  |
| 4  | Pub in top 5% (Percent)      | 5       | 4.8  | 4.9  | 6.5  | 4.8  | 5.2  | 4.5  | 4.6  | 4.1  | 5    | 5.5  |
| 5  | Pub in top 10% Sources (Q3)  | 6248    | 330  | 414  | 464  | 506  | 617  | 682  | 703  | 681  | 828  | 1023 |
| 6  | Pub in top 10% (Percent)     | 11.1    | 10.3 | 11.6 | 11.8 | 10.7 | 11.5 | 11.7 | 10.7 | 9.9  | 11.2 | 11.3 |
| 7  | Pub in top 25% Sources (Q4)  | 15502   | 1023 | 975  | 1076 | 1176 | 1462 | 1647 | 1707 | 1746 | 2049 | 2641 |
| 8  | Pub in top 25% (Percent)     | 27.4    | 31.9 | 27.4 | 27.3 | 24.9 | 27.3 | 28.3 | 25.9 | 25.4 | 27.6 | 29.3 |
| 9  | Pub in top 50% Sources (Q5)  | 32325   | 1759 | 1995 | 2314 | 2606 | 3089 | 3493 | 3695 | 3831 | 4258 | 5285 |
| 10 | Pub in top 50% (Percent)     | 57.2    | 54.9 | 56.1 | 58.7 | 55.2 | 57.7 | 60   | 56.1 | 55.7 | 57.4 | 58.6 |
| 11 | Pub in top 75% Sources (Q6)  | 47454   | 2677 | 2921 | 3332 | 3883 | 4560 | 4956 | 5491 | 5712 | 6337 | 7585 |
| 12 | Pub in top 75% (Percent)     | 84      | 83.6 | 82.2 | 84.5 | 82.2 | 85.1 | 85.1 | 83.3 | 83.1 | 85.4 | 84   |
| 13 | Pub in top 100% Sources (Q7) | 56515   | 3203 | 3555 | 3943 | 4722 | 5357 | 5824 | 6588 | 6876 | 7421 | 9026 |
| 14 | Pub in top 100% (Percent)    | 100     | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  | 100  |

- ❖ The list of top ten most productive universities of Algeria is presented below. For each university the number of publications, citations, authors, CPP and FWCI is provided. Based on the number of publications the highest documents are published by University of Science and Technology Houari Boumediene (n=8310), followed by Badji Mokhtar University (n=5208) and Frères Mentouri Constantine 1 University (n=4808).

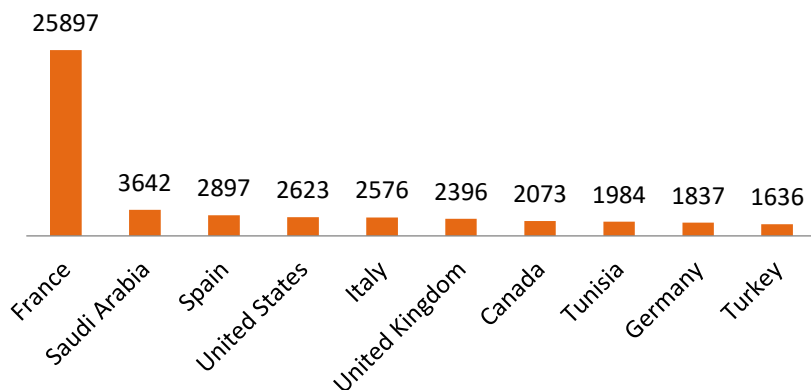
| S# | Institution  | SO   | Citations | Authors | CPP  | FWCI |
|----|--|------|-----------|---------|------|------|
| 1  | University of Science and Technology Houari Boumediene         | 8310 | 64354     | 4699    | 7.7  | 0.71 |
| 2  | Badji Mokhtar University                                       | 5208 | 39351     | 3280    | 7.6  | 0.7  |
| 3  | Frères Mentouri Constantine 1 University                       | 4808 | 34579     | 3020    | 7.2  | 0.67 |
| 4  | Ferhat Abbas Sétif University 1                                | 3940 | 60683     | 2090    | 15.4 | 1.5  |
| 5  | Abou Bakr Belkaid University of Tlemcen                        | 3927 | 27387     | 2637    | 7    | 0.69 |
| 6  | University of Sidi-Bel-Abbès                                   | 3837 | 53302     | 2305    | 13.9 | 1.37 |
| 7  | University of Science and Technology of Oran - Mohamed-Boudiaf | 3263 | 23201     | 2162    | 7.1  | 0.65 |
| 8  | University of Béjaïa   | 3259 | 33009     | 2028    | 10.1 | 0.86 |
| 9  | University of Biskra   | 2707 | 18862     | 1457    | 7    | 0.85 |
| 10 | M'Hamed Bougara University of Boumerdes                        | 2568 | 20868     | 1542    | 8.1  | 0.81 |



\* percentage of scientific output involving foreign collaborators.

- ❖ Algeria has collaborated with 160 countries. Similarly the percent international collaboration (for the last ten years) is presented in above/below figure. The average (for ten years) was found to be 46.7%. Or collectively for eras, Algeria published the highest number of documents (in collaboration) with France (n=25897), Saudi Arabia (n=3642) and Spain (n=2897).

### The Top Ten Collaborating Countries for Algeria





## G. International Cooperation and Support Initiatives (selected)

- ❖ The European Union (EU) remains a close scientific partner for many Arab countries. Over 2017–2018, Algeria, Egypt, Jordan, Lebanon, Morocco and Tunisia signed agreements to participate in the EU's Partnership for Research and Innovation in the Mediterranean Area (PRIMA) programme running to 2028.<sup>13</sup> This programme is exploring new approaches to research and innovation in sustainable agriculture production and water availability. The EU is allocating € 220 million to the programme, with participating countries providing a further € 52 million. This project has been hailed as a major advance in science diplomacy. Six calls for research proposals were launched in February 2020 on water management, the agrifood value chain, the water–ecosystem–food nexus and farming systems.
- ❖ An Algeria-EU Association Agreement is in force since 2005.
- ❖ Algerian participation under Horizon 2020 and related initiatives (PRIMA, BLUEMED) as Research & Innovation cooperation under Horizon Europe.
- ❖ The Algeria-EU Joint Science & Technology Coordination Committee (JSTCC). Here, representatives of the Algerian Ministry of Higher Education and Scientific Research and of DG RTD exchanged views on the further implementation of the bilateral S&T agreement.





INNOVATION

## H. INNOVATION, ENTREPRENEURSHIP & TECHNOLOGY PARKS

### ❖ **Science Governance: Key policy initiatives:**

- Algeria has begun implementing a new innovation strategy built on the following pillars: placing firms at the centre of innovation; supporting innovative SMEs; integrating science and innovation policies into government decision-making; and fostering stronger linkages between firms and the scientific research community.
- In January 2017, parliament adopted the orientation law for the development of SMEs. It aims to boost public and private R&D through incentives and financial support. The decree of application led to the establishment of the Agency for the Development of SMEs and Promotion of Innovation in July 2018, with a mandate to support business incubation, foster technology transfer and assist SMEs in reaching foreign markets (OBG, 2018a). The law also led to the establishment of several Innovation and Technology Transfer Centres, to promote synergies between research and industry.
- Parliament passed a law (#17-02) in June 2017 to support new businesses, promote innovation and improve SMEs' export capacity and competitiveness. The law also lays the groundwork for establishing two funds to support SMEs, the SME Credit

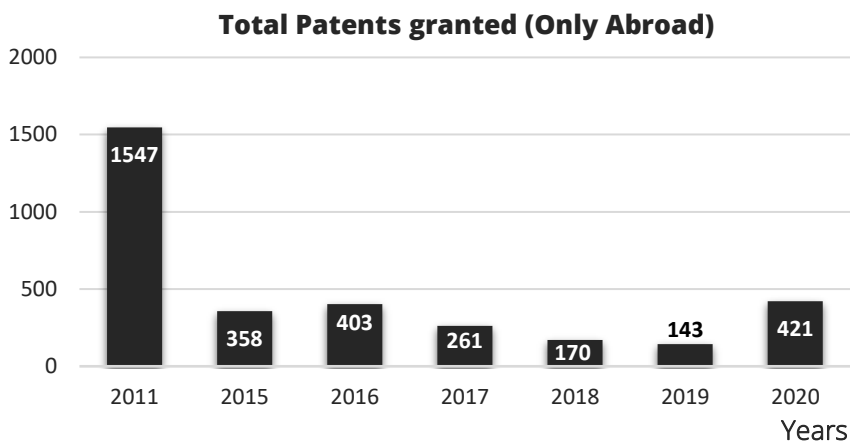
Guarantee Fund and a seed capital fund (OBG, 2018a).

- A new Delegate Ministry for Start-ups and the Knowledge Economy has been established. This delegate ministry has overseen the creation of an investment fund to finance start-ups, as well as a High Council of Innovation to support strategic orientation. It has also coordinated the elaboration of a legal framework to define and label concepts relating to start-ups, incubators and the knowledge economy and has allocated dedicated spaces for business incubation, as well as 25 planned FabLabs.

#### ❖ **Digitizing the economy:**

- The e-Algérie (2013) strategy targets the digital economy. It has 13 major thrusts, including those of accelerating the use of digital technologies in public administration and the business sector, developing the digital economy, strengthening telecommunications infrastructure and fostering research and innovation.
- Several legislative reforms have been designed to support the digital economy e.g with fixing the rules for electronic signatures and certification; a law (#4) in 2018 on postal and electronic communications, for shop-owners to have electronic payment terminals, etc. This resulted in a 52% increase in the number of digital transactions taking place in 2019 over the previous year.
- The year 2016 saw the introduction of 4G to the Algerian market; by the following year, there were 9.9 million subscribers to this technology (OBG, 2018a).

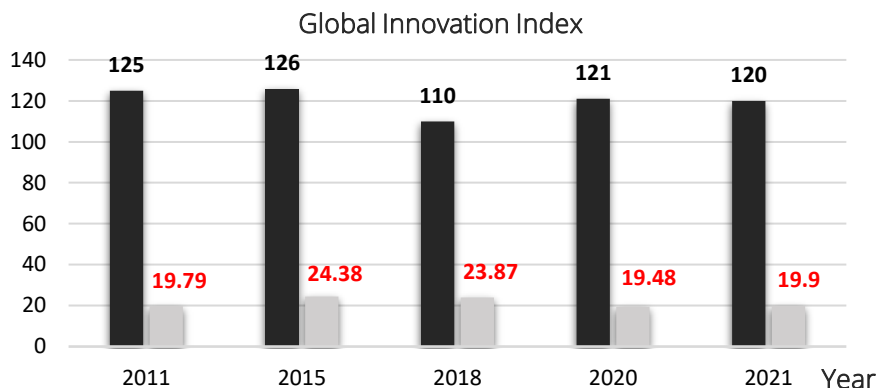
These reforms helped Algeria to move up seven places in the World Economic Forum's 2019 Global Competitiveness Report over the previous year.



| Year | Resident | Non-Resident | Abroad |
|------|----------|--------------|--------|
| 2011 | 93       | 1,453        | 1      |
| 2015 | 74       | 279          | 5      |
| 2016 | 44       | 339          | 20     |
| 2017 | 80       | 176          | 5      |
| 2018 | 27       | 135          | 8      |
| 2019 | 31       | 109          | 3      |
| 2020 | 49       | 372          | -      |

Source: WIPO - [https://www.wipo.int/ipstats/en/statistics/country\\_profile/](https://www.wipo.int/ipstats/en/statistics/country_profile/)

- ❖ In the last 5 years, Algeria's patent output does not show any significant trend as shown the preceding figure. The number of patents granted to residents has remained at or below 80, while non-resident patents have fluctuated between slightly over a hundred to as high as 372 in recent years. Patent applications between 2010 and 2019 were recorded at 7,921 placing Algeria at the 11th position amongst the OIC countries.



Source: *Global Innovation Index\_WIPO*

■ Ranking

■ Score

- ❖ Algeria's GII ranking has varied between 110 and 126 in recent years with 120 being its most recent rank, internationally. Its GII score is currently 19.9 and has shown no major changes in the past few years. Clearly Algeria's investment eco-system as reflected in the GII does not show any major improvements in recent years. Within the OIC it is ranked at 31<sup>st</sup> position in terms of GII score.
- ❖ The World Economic Forum paints a brighter picture, placing Algeria fourth in the region in its Global Competitiveness Index, highlighting improvements in innovation and technology, such as in telecommunications.
- ❖ **Technology Parks/Incubators:**
  - **Investment in technoparks:**
    - The National Agency for the Promotion and Development of Technoparks (est. 2004) secured a loan of (ca US\$ 116 million) in 2018 to invest in its technoparks in Oran, Algiers, Annaba and Ouargla. Algiers' Sidi Abdellah technopark is to receive more than one-third of this loan, part of which will be invested in the construction of a second data centre (OBG, 2018a).

- Innovation hubs have also emerged spontaneously in certain territories, such as Sétif and Bordj Bou-Arredj. They specialize in information and communication technologies (ICTs) and electronics but remain small-scale.
- **Smart Cities and Innovation Hubs:**
  - The Algiers Smart City project was launched in mid-2017, with the goal of transforming Algiers into a 'completely intelligent city' by 2035. The aim is to promote synergies and cooperation in technology with international actors, provide support for start-ups and develop the 'technological ecosystem'.
  - In April 2018, the Experimental Laboratory and the Technology Innovation Hub were launched. The laboratory provides an environment in which to test chosen proposals before launching at scale, whereas the innovation hub offers mentoring and serves as a physical space for international and local partners to meet.
  - The Hassi Messaoud smart city is presently under construction. Expected to become a 'model ecological city' serving a population of 80 000, it will count a green belt, wastewater treatment plant and technical landfill centre.



## I. COMBATING THE COVID-19 PANDEMIC

### ❖ **Algeria's COVID-19 hotline**

Algeria, with the second-highest COVID-19 cases in Africa, set up a call centre in the capital Algiers on 26 February, a day after it confirmed the first case of the virus, to boost early detection and help contain wider spread of the disease. Around 10 days after being established, more than 46 000 people had called the centre's 24-hour toll-free number.

Volunteer doctors manage the 20 extensions of the hotline. "The toll-free line is critical in providing the right information to the public about coronavirus. Through the calls we counter false information among communities and on social media about the disease," said Dr Hammadi Samia, in charge of International Health Regulations at Algeria's Ministry of Health.

### ❖ **Covid-19: Sidal to become regional producer of CoronaVac**

The public pharmaceutical group Sidal, which is to about to start the production of the anti-Covid-19 vaccine of the Chinese firm Sinovac, under the trade name "CoronaVac," will become a regional producer of this vaccine, said an official at the Ministry of Pharmaceutical Industry.



## ❖ **Algeria begins Sinovac vaccine production**

Algeria has started producing the Covid-19 vaccine developed by Chinese firm Sinovac, with production expected to be eight million doses a month. Production could be doubled in the North African nation if needed, officials said.





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