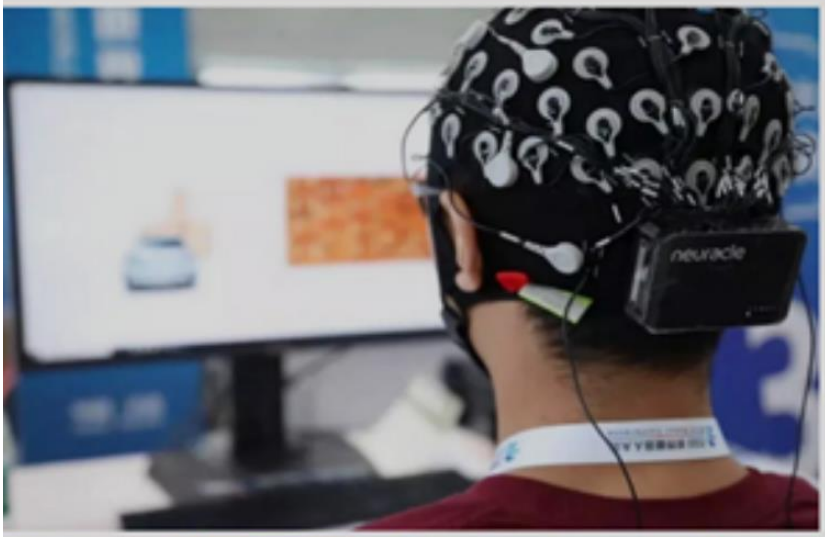





The Republic of Iraq

STI Profile of the OIC Member State

Science, Technology, and Innovation Indicators







COMSTECH

Editor:

Prof. Dr. S. Khurshid Hasanain
Adviser COMSTECH

Data Collection & Layout:

Mr. Umer Ali
Programme Officer COMSTECH

Mr. Muhammad Jamil
PS COMSTECH

Dr. Waseem Hassan
Associate Professor, University of Peshawar

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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Following is the list of topics covered in the STI profiles of OIC Member States. All sub-sections/topics may not appear for every country due to unavailability of some data.

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IRAQ

The Republic of Iraq, is a country in Western Asia. Iraq is one of the easternmost countries of the Arab world, located at about the same latitude as the southern United States. Iraq has 36 miles (58 km) of coastline along the northern end of the Gulf, giving it a tiny sliver of territorial sea. It is bordered by Turkey to the north, Iran to the east, the Persian Gulf and Kuwait to the southeast, Saudi Arabia to the south, Jordan to the southwest and Syria to the west. The geography of Iraq is diverse and falls into five main regions: the desert (west of the Euphrates), Upper Mesopotamia (between the upper Tigris and Euphrates rivers), the northern highlands of Iraq, Lower Mesopotamia, and the alluvial plain extending from around Tikrit to the Gulf. Most of Iraq's land is covered by the desert. However, the country has two major rivers, the Euphrates and Tigris, that are vital to Iraq.

The capital and largest city is Baghdad. The official languages of Iraq are Arabic and Kurdish; others also recognised in specific regions are Suret (Assyrian), Turkish (Turkmen) and Armenian. Iraq is home to diverse ethnic groups; mostly Arabs, as well as Kurds, Turkmen, Assyrians, Armenians, Yazidis, Mandaeans, Persians and Shabakis with similarly diverse geography and wildlife. Most Iraqis are Muslims and minority faiths include Christianity, Yazidism, Mandaeism, Yarsanism and Zoroastrianism. Iraq is home to two of the worlds holiest places among Shia's: Najaf and Karbala. The 2021 estimate of the total Iraqi population is 43.53 million. The main occupations in Iraq encompass a diverse range of sectors. Agriculture and farming form a significant part of the economy, while the oil and gas industry plays a crucial role due to Iraq's vast reserves.
The Kurdistan Region of the Republic of Iraq (KRI) is a constitutionally recognized semiautonomous region in northern Iraq with a population of 5.1 million (2012 estimate). Its government (the KRG), based in Erbil, has the right, under the Iraqi constitution of 2005, to exercise legislative, executive, and judicial powers according to the constitution, except in what is listed therein as exclusive powers of the federal authorities. Iraqi Kurdistan or Southern Kurdistan refers to the Kurdish-populated part of northern Iraq.

The Sumerians were the very first people to settle into Mesopotamia (modern-day Iraq) around 4800 BC marking the emergence of the first human civilization. Mesopotamia eventually coalesced into two distinct empires: Assyria in the north and Babylonia in the south. The Babylonian Empire ushered in a new era in Mesopotamia after the downfall of the Akkadians. The Babylonians were defeated by Cyrus the Great of the Achaemenid Empire (539 BC), and Mesopotamia would later become subject to subsequent conquests by Alexander the Great (331 BC), the Romans under Trajan, the Parthian empire in the 3rd century BC, and the Sassanid dynasty in the 3rd through 7th centuries AD. The region of Mesopotamia came under Arab influence in 636 AD and it was the Arabs who were first to call the country "Iraq" meaning "the fertile". The Rashidun Caliphate, Ali ibn Abi Talib, moved his capital from Medinah to the city of Kufa when he became the fourth Caliph.


Following the Muslim conquest of Mesopotamia, Baghdad became the capital and the largest city of the Abbasid Caliphate, and during the Islamic Golden Age, the city evolved into a significant cultural and intellectual center, and garnered it a worldwide reputation for its academic institutions, including House of Wisdom. The city was largely destroyed at the hands of the Mongol Empire in 1258 during the siege of Baghdad, resulting in a decline that would linger through many centuries. Modern Iraq dates back to 1920, when the British Mandate for Mesopotamia, joining three Ottoman vilayets, was created. A British-backed Kingdom was established in 1921 under Faisal I of Iraq. The Hashemite Kingdom of Iraq gained independence from the UK in 1932. In 1958, the monarchy was overthrown and the Iraqi Republic created. Iraq is a federal parliamentary republic. The president is the head of state, the prime minister is the head of government, and the constitution provides for two deliberative bodies, the Council of Representatives and the Council of Union.


Source:https://en.wikipedia.org/wiki/Iraq
Source: https://en.wikipedia.org/wiki/Iraqi_Kurdistan
Source:https://www.worldbank.org/en/topic/macroeconomics/publication/the-kurdistan-region-of-iraq-assessing-the-economic-and-social-impact-of-the-syrian-conflict-and-isis

A. ECONOMIC OVERVIEW

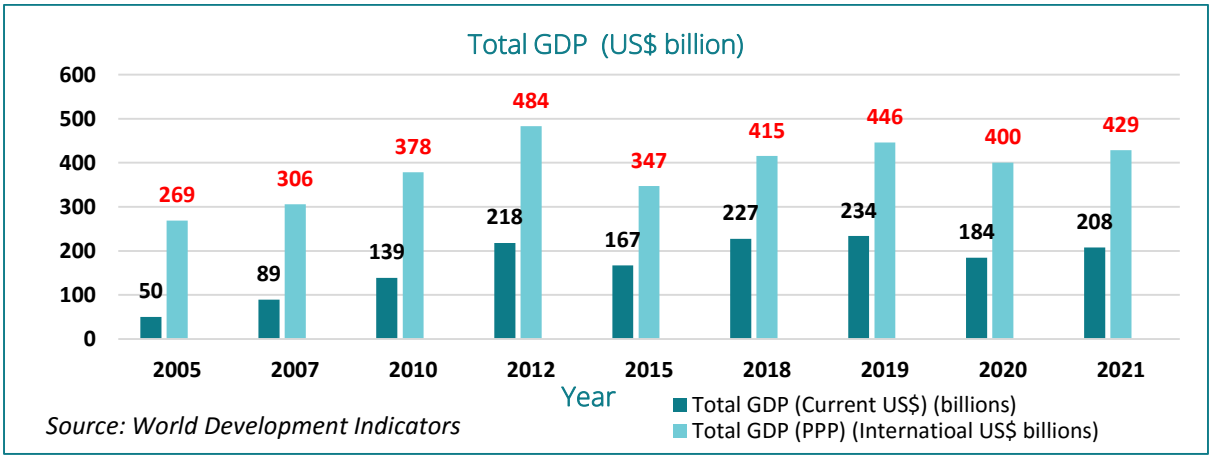
Iraq's economy is dominated by the oil sector, which has traditionally provided about 95% of foreign exchange earnings. The lack of development in other sectors has resulted in 18%–30% unemployed and a total GDP of 208 billion (current US$). Public sector employment accounted for nearly 60% of full-time employment in 2011. The oil export industry, which dominates the Iraqi economy, generates very little employment. Currently only a modest percentage of women (the highest estimate for 2011 was 22%) participate in the labour force.

Prior to US occupation, Iraq's centrally planned economy prohibited foreign ownership of Iraqi businesses, ran most large industries as state-owned enterprises, and imposed large tariffs to keep out foreign goods. After the 2003 invasion of Iraq, the Coalition Provisional Authority quickly began issuing many binding orders privatising Iraq's economy and opening it up to foreign investment.

Source: https://en.wikipedia.org/wiki/Iraq

Iraq ranks 36th among the 36 upper-middle-income group economies and 19th among the 19 economies in Northern Africa and Western Asia.

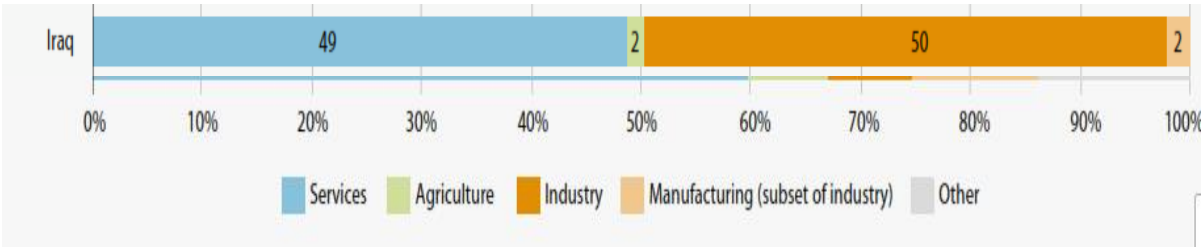
❖ Iraq GDP



It is clear from the GDP data of Iraq since 2005, that there has been a consistent recovery from the economic demonstration caused by US-led invasion 2003. The GDP incrased systematically from US$50 billion in 2005 to US$234 billion in 2019, only to decline in 2010 and to recover significantly in 2021, as the effects of the 2020 pandemic began to recede.

❖ GDP Per Economic Sector In Iraq, 2019 (%)

The Industry and Services sectors account almost equally for nearly the enitre GDP of Iraq.



Source: UNESCO Science Report 2021

❖ High Tech Exports

Data for Iraq's high tech exports is not available.

B. SOCIAL AND HUMAN DEVELOPMENT

Following are some of Iraq's key social indicators:

Series Name	2016	2017	2018	2019	2020	2021
Life expectancy at birth, total (years)	68.988	70.413	71.514	71.576	69.123	..
Literacy rate, adult female (% of females ages 15 and above)	76.80	79.90	..	..	..	..
Literacy rate, adult male (% of males ages 15 and above)	90	91.19	..	..	..	..
Literacy rate, adult total (% of people ages 15 and above)	83.30	85.59	..	..	..	..
Mobile cellular subscriptions	33447000	33415690	36527353	37224759	37475325	37649112
Mobile cellular subscriptions (per 100 people)	86.43	84.33	89.98	89.56	88.05	86.48
Mortality rate, infant, female (per 1,000 live births)	21.7	21.1	20.4	19.8	19.2	18.7
Mortality rate, infant, male (per 1,000 live births)	26.4	25.6	24.9	24.2	23.4	22.7

- Life expectancy has varied between 69 and 71 years in recent years.
- The last recorded literacy rate is 80 percent.

	Average GDP growth rate (%)		GDP per capita (constant 2017 PPP$)	Average FDI inflows as a share of GDP (%)		Share of population using Internet (%)	High-tech exports as share of manufactured exports (%)	Unemployment rate (%)
	2012–2015	2016–2019	2019	2012–2015	2016–2019	2019	2018	2019
Iraq	6.18	4.14	10 881	-2.01	-2.41	75.0[1]	–	12.8

- The GDP per capita was US$10,881 (PPP).
- About 75% of the population access to internet in 2019, about 13% of the population was unemployed.

Five years after the invasion, an estimated 2.4 million people were internally displaced (with a further two million refugees outside Iraq), four million Iraqis were considered food-insecure (a quarter of children were chronically malnourished) and only a third of Iraqi children had access to safe drinking water.

C. KEY POLICIES AND GOVERNMENT ORGANISATIONS RELATED TO SCIENCE, TECHNOLOGY AND HIGHER EDUCATION

Successive Iraqi constitutions and derivative government policies have traditionally placed a great deal of emphasis on education in general, often dwelling on deeply entrenched values relatin to the acquisition and dissemination of knowledge for human development, preservation of natural resources and combating environmental degradation.

In 2005, UNESCO began helping Iraq to develop a Master Plan for Science, Technology and Innovation that would ultimately cover the period 2011–2015, in order to revive the economy in the aftermath of the US-led invasion in 2003 and to address pressing social needs such as poverty and environmental degradation. Following an analysis of the strengths and weaknesses of different sectors, UNESCO accompanied Iraq in preparing a Framework and Agenda for Action (2013) to complement the country's National Development Plan for the years 2013–2017 and to set the stage for a more comprehensive STI policy.
Source: UNESCO Science Report 2015

❖ Key Policy Initiatives in S&T:

➢ Ministry of Higher Education and Scientific Research

The Ministry of Higher Education and Scientific Research (MOHESR) is the Iraq government agency responsible for higher education and scientific research. It monitors the work of universities and allocates their budgets to sponser Iraqi students to study in overseas universities in Britain, the United States, Australia, and other countries.

With regard to scientific research in particular the Ministry possesses a Directorate of Research and Development, overseen by a Deputy Minister. The Directorate has the following subdivisions:

- Care of Scientists and Innovators
- Scientific Affairs
- Coordination and Relations
- Graduate Studies
- Control of Chemical Hazards
- Pilot Projects

➢ Ministry of Science and Technology

The Ministry of Science and Technology (MoST) came into being as a result of the dissolution, in August 2003, of the Ministry of Atomic Energy. Around 1,500 of the latter ministry's engineers and scientists, reportedly engaged in defence industry projects were transferred to the newly established ministry.

Unrest has continued to impede the efforts of the Ministry of Higher Education and Scientific Research to develop a comprehensive STI strategy (Bizri, 2018). This ministry has proposed establishing a National Council for Scientific Research but this is yet to be implemented.

Source: UNESCO Science Report 2021

Source:https://en.wikipedia.org/wiki/Ministry_of_Higher_Education_and_Scientific_Research_(Iraq)#:~:text=The%20Ministry%20of%20Higher%20Education,universities%20and%20allocates%20their%20budgets

➢ Ministry of Higher Education and Scientific Research in the Kurdistan Region of Iraq (MoHESR/KRG)

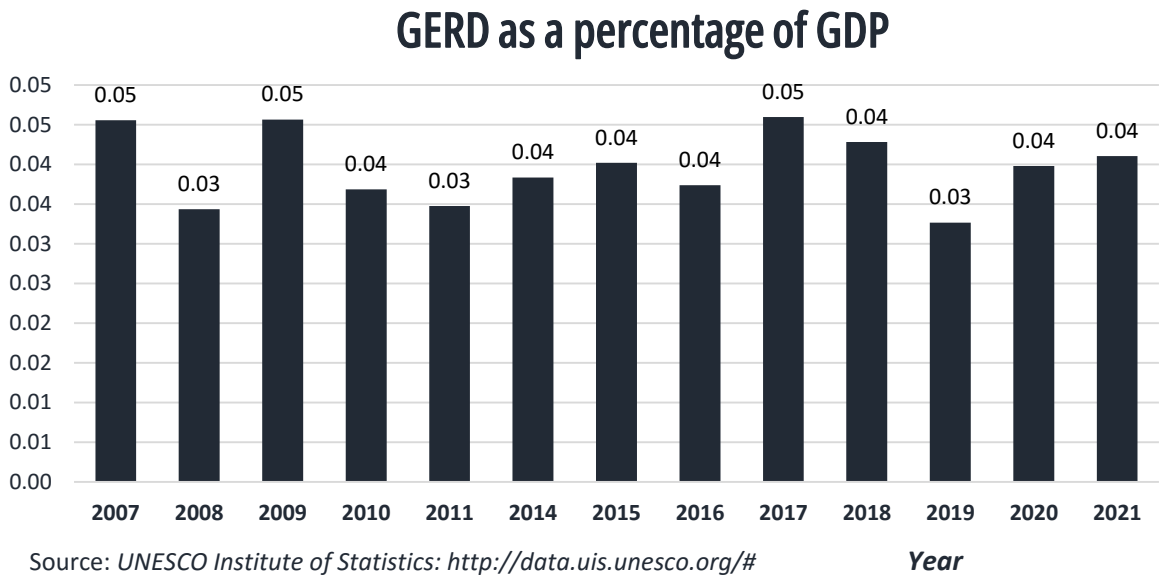
MoHESR/KRG has adopted a short-term strategy with objectives including the establishment of a research centre within every university. As a result, since 2006, every public university in the Kurdish region had a research centre. The Ministry directs research and allocates research funding for research in fields considered key priorities. All programmes are said to run for a minimum period of four years, with funding provided by MoHESR/KRG.

D. RESEARCH AND DEVELOPMENT

Traumatic events in Iraq during the past 3-4 decades have left their mark on research and development activity throughout the country. While some institutions seemed to recover during the past five years, others are still to regain a semblance of their past capabilities.

❖ GERD as a Percentage of GDP

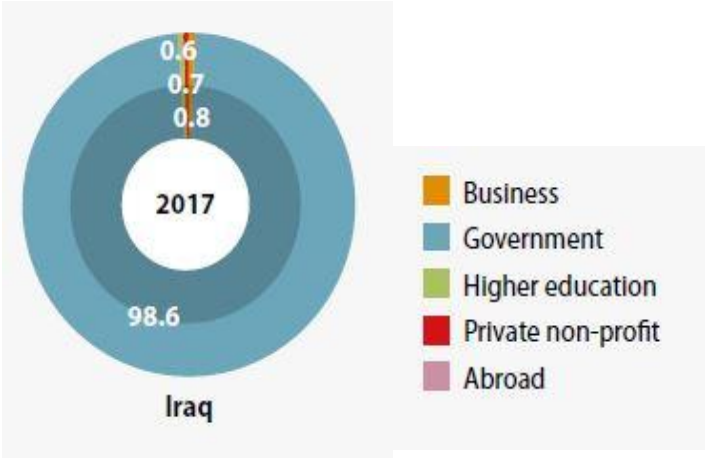
The trend of variation of Iraq's Gross expenditure on Research and Development (GERD) is shown in the graph. Between 2007 and 2021, it depicts a constant expenditure of GDP onf GERD which is drastillcaly low as compared to the global average GERD of 1.79%.



Source: *UNESCO Institute of Statistics: http://data.uis.unesco.org/#*

❖ GERD by Source of Funds in Iraq, 2018 or Closest Year (%)

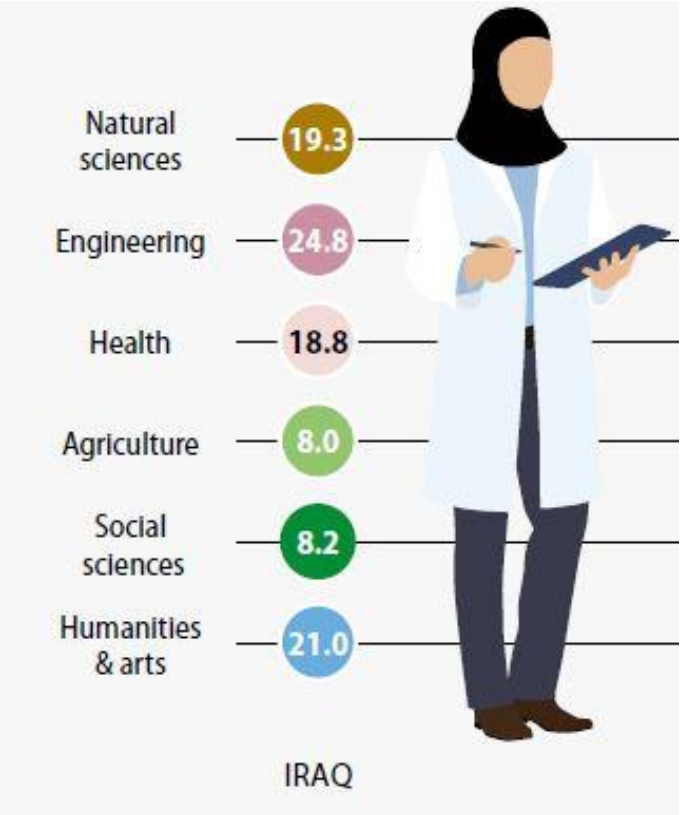
As shown below government (98.5%) is the principal sources of GERD spending in Iraq.



Source: UNESCO Science Report 2021

❖ GERD by Fields in Iraq, 2017 or Closest Year (%)

In terms of the sectors where the investment is being made in R&D, engineering with 24.8%, health with 18.8%, and natural sciences with 19.3% of GERD investment, are the leading areas in the fields of science and technology.

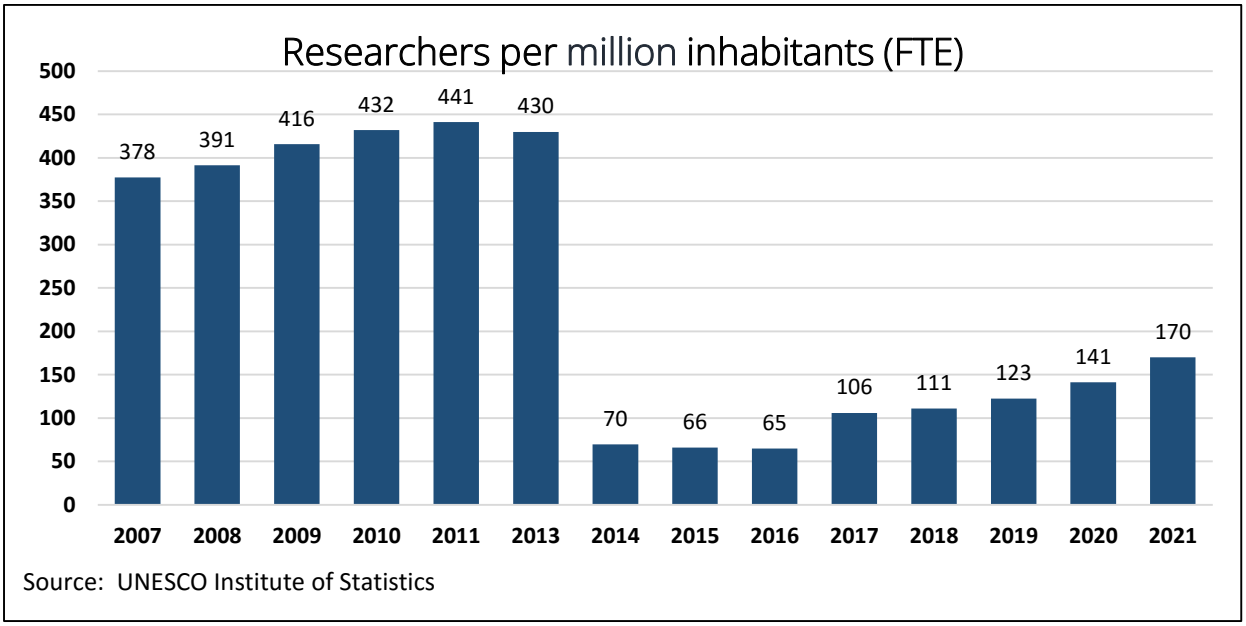


Source: UNESCO Science Report 2021

❖ R&D Human Capital

➢ Researchers per Million Inhabitants (FTE)

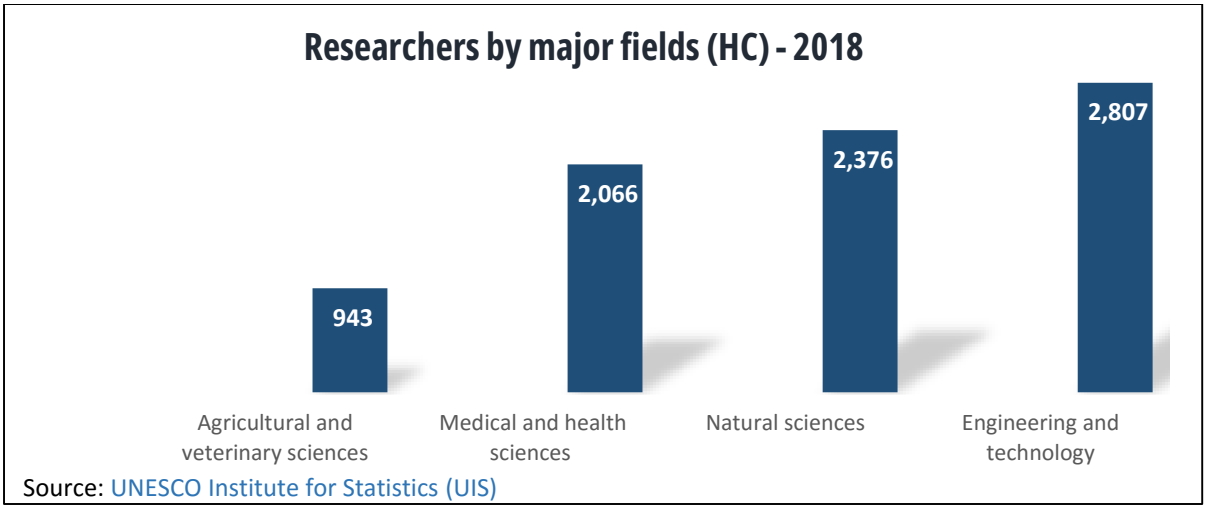
The number of researcher per million decreased from 378 in 2007 to 170 per million in 2021, showing a strong decrease which is consistent with the country situation.



The drastic decline in the number of researchers after 2013 is most likely related to the internal political conflicts in Iraq starting after US withdrawal in 2011, and in particular due to the destructive activities of the ISIS in Iraq, starting around 2013. However, it is noticeable that recovery in this field is taking place consistently and the number of researchers has increased from 70 to 170 per million between 2014 and 2021.

❖ Researchers Distribution by Major Fields (HC)

The distribution of researchers (Headcount) between different fields for 2018 shown in the following figure. Engineering and technology clearly employs the largest number of researchers (2807) while natural sciences (2376) and medicine and health services (2066) are the next large sectors of employment in R&D. The total number of researchers (HC) were 8192 in 2018.



Source: UNESCO Institute for Statistics (UIS)

❖ R&D Centres

➢ The Academic Research Institute in Iraq (TARII)

The Academic Research Institute in Iraq was established to promote scholarly research on and in Iraq and ancient Mesopotamia. The Institute, a consortium of American universities and museums, intends to establish a multidisciplinary American scholarly research center in Iraq when conditions permit. TARII raises funds for graduate and post-graduate fellowships for Americans to work on Iraq in as broad a range of disciplines as possible. It also has a fellowship program for Iraqi academics to aid them in carrying out research in Iraq. TARII initiates its own research projects and fosters joint projects between American and Iraqi academics. Like similar American overseas research centers, TARII has as its primary focus the humanities and social sciences, as well as closely related natural sciences.

➢ The Scientific Centre for Research and Developments (SCRD)

The Scientific Centre for Research and Developments (SCRD) in Iraq University College aims to deepen the relationship between the university and all sectors of society through the integration of the scientific aspect practical side, so by taking advantage of relevant practical experience and scientific expertise in the fields of civil

engineering and engineering and communications and computer networks as well as the experience of project management to develop and raise the level of scientific research and university advancement into the ranks of world universities.

❖ Reconstruction Efforts of R&D

Major reconstruction efforts are underway in Iraq to revitalize its science and technology sector, aiming to foster innovation, research, and development. The Iraqi government, in collaboration with international partners, is investing in the establishment and enhancement of research institutes, universities, and technology parks. Additionally, initiatives are focused on building research and development capabilities, promoting entrepreneurship, and providing support for start-ups and technology-based industries. These efforts aim to strengthen Iraq's scientific and technological capabilities, ultimately contributing to the country's economic growth and sustainable development.

Source: UNDP Iraq

❖ NEW INITIATIVES

➢ Total Set to Launch 1,000 MW Power Project in Iraq

France's Total Energies is pushing ahead with plans to build a 1,000 megawatt solar power project in Iraq after the project was endorsed by Baghdad in June 2023, according to a statement by the Iraqi Electricity Ministry. Electricity Minister Ziad Fadil gave the green light for the project in the Southern port of Basra during talks with a Total Energies delegation in Baghdad, it said. "Total Energies will soon embark on a project to build a 1,000 MW solar power park in the Artawi oilfield in Basra...the project is the beginning of a promising partnership between Iraq and the French company," the statement added. The solar park project is part of a $27 billion framework agreement signed by Iraq and France in Sept 2021.It includes three contracts between the Iraqi Ministry of Oil and Total energies. The fourth contract is for the solar energy project in Basra.

Source: https://www.zawya.com/en/projects/utilities/total-set-to-launch-1-000-mw-power-project-in-iraq-i25vd4ez

- **Iraq Uses Nuclear Technology to Improve Crop Productivity and Adapt to Climate Change**

A new drought-tolerant wheat variety developed in Iraq with the support of the IAEA and the Food and Agriculture Organization of the United Nations (FAO) has increased yields four-fold. This mutant variety now accounts for close to two thirds of all the wheat produced in the country. Iraq is increasingly making use of nuclear technology to improve its crop yields and cope with challenges brought about by a changing climate. Researchers in Iraq have developed new drought-tolerant plant varieties and improved water and soil management. These developments have helped enhance food production and adapt to climate change.

Source:https://www.iaea.org/newscenter/news/iraq-uses-nuclear-technology-to improve-crop-productivity-and-adapt-to-climate-change

E. HIGHER EDUCATION

- Following is the list of national and global ranking of leading Iraqi universities:

University Name	National Ranking	Global Ranking
University of Baghdad	1	1580
Diyala University	2	1752
Mustansiriyah University	3	2391
University of Mosul	4	2563
University of Babylon	5	2663
University of Basrah	6	2691
Al Qadisiyah University	7	2743
Kufa University / University of Kufa	8	2745
University of Technology Iraq	9	2842
University of Sulaimani	10	2884
University of Anbar	11	3008
Al Furat Al Awsat Technical University	12	3065
Tikrit University	13	3075
Salahaddin University Erbil	14	3131
Tishk International University (Ishik University)	15	3181

Source: https://www.webometrics.info/en/Asia/Iraq

➢ The University of Baghdad

The University of Baghdad was founded in 1957 as the second largest university in the Middle East and the oldest university in Iraq, including It is the first of its kind from which all highly trained faculty members, technical and administrative staff have emerged and who became the first seed for establishing and the rehabilitation of other Iraqi universities' staff in addition to those of other government institutions. The total number of students enrolled in the university is more than 70000.
It has a strong focus on engineering, medicine, and agricultural sciences. The university's research interests include renewable energy, water resources management, nanotechnology, biotechnology, and medical advancements.

➢ University of Technology, Iraq

The university specialized in engineering and renowned for its contributions to applied research. The university's R&D interests encompass a broad range of areas, including computer science, telecommunications, civil engineering, renewable energy systems, agricultural biotechnology, water resources management, computer science, and environmental studies.

➢ University of Basra

Located in the southern region of Iraq, the University of Basra is recognized for its research initiatives in environmental sciences, petroleum engineering, and marine sciences. The university's R&D interests encompass oil and gas exploration and production, environmental sustainability, desalination technologies, and marine biology.

➢ University of Mosul

The University of Mosul is known for its extensive research endeavours, particularly in the fields of pharmaceutical sciences, medical research, and engineering. The university's R&D interests include drug discovery and development, medical genetics, tissue engineering, civil engineering, and geotechnical studies.

Iraqi universities achieved competitive positions in the Scimago Institutions Rankings (SIR) for 2023. The SIR report for 2023, which evaluated 8,433 institutions around the world included 47 Iraqi

institutions. These Iraqi institutions include 28 universities, the most prominent of which are Komar University of Science and Technology, University of Technology, University of Baghdad, University of Sulaimani, University of Babylon and Mustansiriyah University.

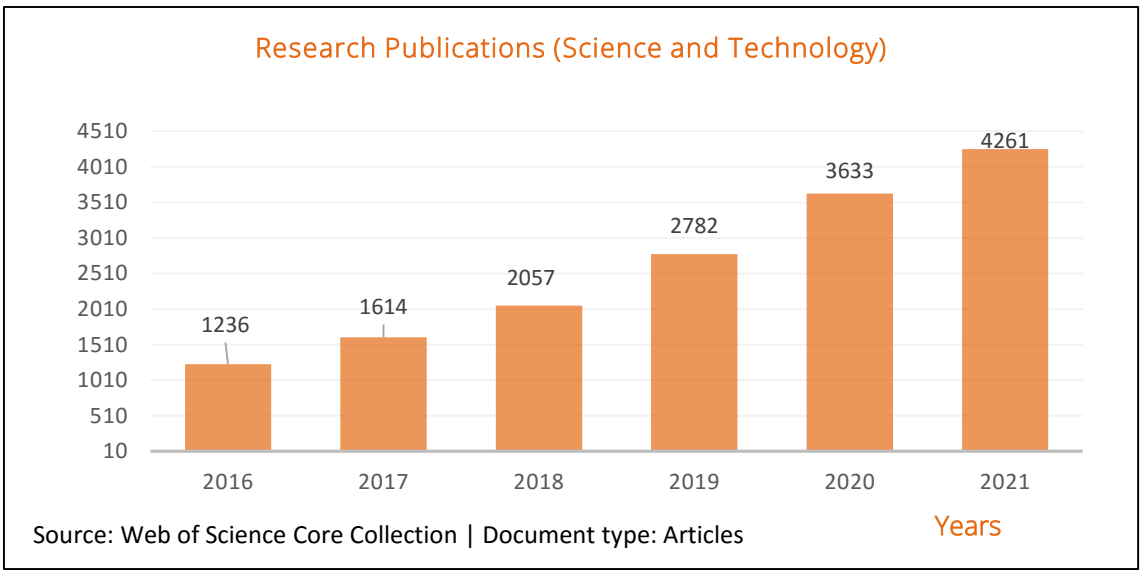
❖ International Rankings of Institutions

Iraqi universities and colleges record rising competition in international rankings, including the Shanghai Ranking, where the University of Baghdad's chemical engineering major was ranked, The Times ranking, in which eight Iraqi universities were ranked, and the QS ranking, where five Iraqi universities were ranked.

Source:https://www.iraqinews.com/iraq/iraqi-universities-achieve-high-ranks-in-scimago-institutions-rankings/

F. RESEARCH PUBLICATIONS

❖Scientific Publications in Science and Technology, 2016–2021



Publication Ranking: Iraq in OIC Ranking: 17th

Above data shows the trend of Iraq's scientific research (publish articles only) in impact factor journals.

In the following section, we will provide numerical data about all the science and technology research publications (Scholarly output) of Iraq. Note that the SO includes:

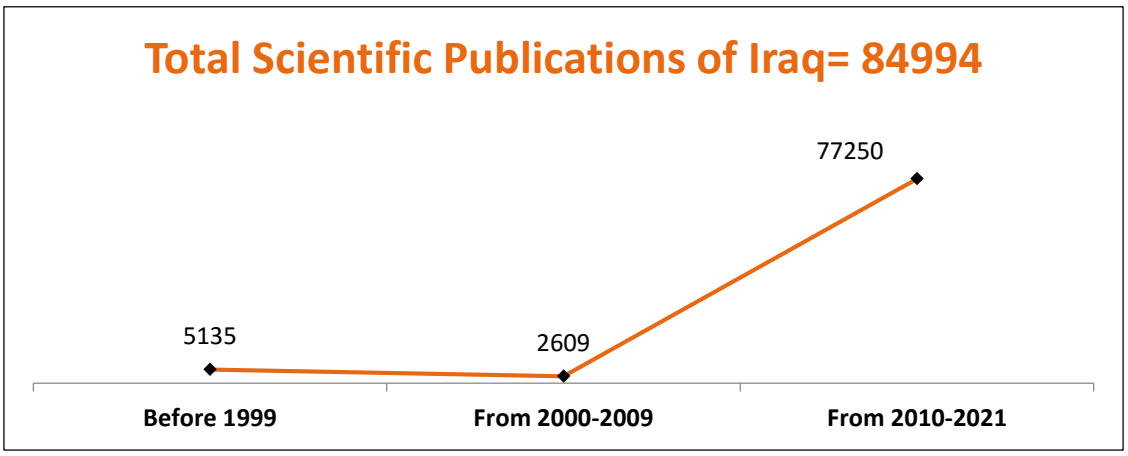
- Journal publications
- Book series

- Stand-alone books (including edited volumes, monographs, text books and reference works).

❖ Based on the scholarly output we will provide and analyze the last ten years (from 2012 to 2021) data. We will present:

1. The per year publications.
2. Quality of publications as indicated by:
   a) The per year citations,
   b) Citations per publications and
   c) Field weighted citation impact.
3. The quality of publications as represented by the purpose, the publications distribution in different quartile groups.
4. The number of papers in different subject areas will be provided.
5. The top five most productive universities based on the number of publications.
6. The percent (%) international collaboration and the top five collaborating countries.

The data retrieved from Scopus was employed for above purposes. Before 1999, Iraq has published only 5135 papers. In total 84994 documents have been published till 2021. The data is presented in the following figure.



1. From 2012 to 2021 the per year number of publications or scholarly output (SO), citations, and citations per publications (CPP) is also presented (as shown in the table).
2. The highest documents are published in 2020 (n=19145), followed by 2021 (n=17570) and 2019 (n=14332).

3. The total citations were 624457, or the CPP was 8.3.
4. Article Field Weighted Citation Impact (FWCI) is another indicator which can be used to present the quality of papers. It "indicates how the number of citations received by an article compares to the average or expected number of citations received by other similar publications". The total FWCI was found to be 0.91 which indicate that the articles received 9 % lesser citations as compared with global average.

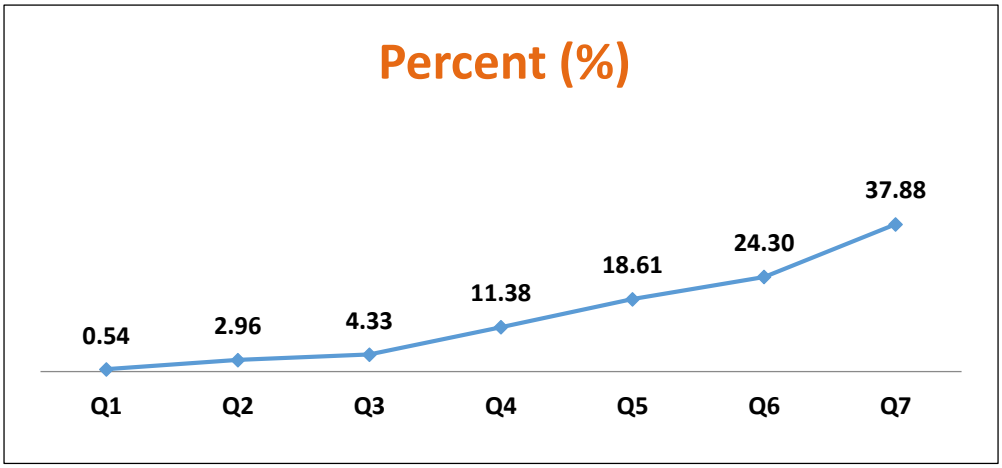
S#	Title	Overall	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Scholarly Output	75652	1461	1771	2051	2230	3250	4494	9348	14332	19145	17570
2	Citations	624457	18390	25718	33512	47813	58789	79718	98124	90381	105812	66200
3	Citations per Publication	8.3	12.6	14.5	16.3	21.4	18.1	17.7	10.5	6.3	5.5	3.8
4	Field-Weighted Citation Impact	0.91	0.51	0.67	0.8	1.38	1.11	1.18	0.92	0.74	0.84	1.05

Scopus has categorized all journals in seven quartile (Q) groups (from Q1 to Q7). For example, Q1 is occupied by the top 1%, and Q7 is occupied by journals in the 75 to 100% group. The per year publications details in different quartile groups are presented in the table.

S#	Title	Overall	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Pub in top 1% Sources (Q1)	321	6	10	10	16	33	50	45	34	59	58
2	Pub in top 5% Sources(Q2	2074	45	66	92	114	157	242	252	286	407	413
3	Pub in top 10% Sources(Q3)	4639	76	138	194	240	343	504	565	634	901	1044
4	Pub in top 25% Sources(Q4)	11373	224	328	443	519	699	963	1289	1639	2346	2923

5	Pub in top 50% Sources(Q5)	22387	467	718	901	999	1227	1685	2537	3724	4456	5673
6	Pub in top 75% Sources(Q6)	36769	736	1087	1325	1446	1723	2747	4259	6686	7284	9476
7	Pub in top 100% Sources(Q7)	59187	1048	1397	1614	1833	2110	3632	6556	11841	14416	14740

In the table the overall percentage of publications in various Q-groups is presented. In particular, the highest documents are published in Q7, followed by Q6 and Q7.



- In the following table we describe the number of publications in Iraq major research areas.
- The highest number of documents were published in;

1. Engineering (n=21549)
2. Computer Science (n=13513) and
3. Physics and Astronomy (n=11743)

- The highest citations were noted for;

1. Engineering (n=185381)
2. Materials Science (n=114086) and
3. Medicine (n=140187)

- The citations per paper (CPP) and field weighted citation impact (FWCI) for selected areas are also given in the table.

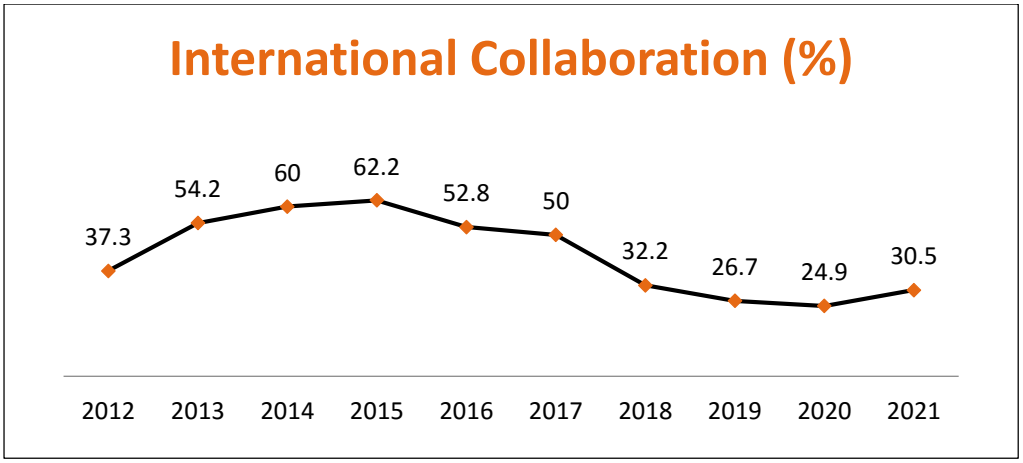
S#	Subject Area	SO	Citations	CPP	FWCI
1	Engineering	21549	185381	8.6	0.99
2	Computer Science	13513	94044	7	0.9
3	Physics and Astronomy	11743	92750	7.9	1.31
4	Medicine	11003	140187	12.7	1.15
5	Materials Science	10419	114086	10.9	1.18
6	Biochemistry, Genetics and Molecular Biology	8531	62617	7.3	0.51
7	Agricultural and Biological Sciences	8078	36567	4.5	0.5
8	Pharmacology, Toxicology and Pharmaceutics	8042	31991	4	0.38
9	Environmental Science	7558	61255	8.1	0.82
10	Chemistry	7325	76335	10.4	0.75

NOTE: *The total scholarly output (SO) may be different from the sum total of publications (sorted according to Journal classification) because the same publication may be appearing under various classifications, concurrently.*

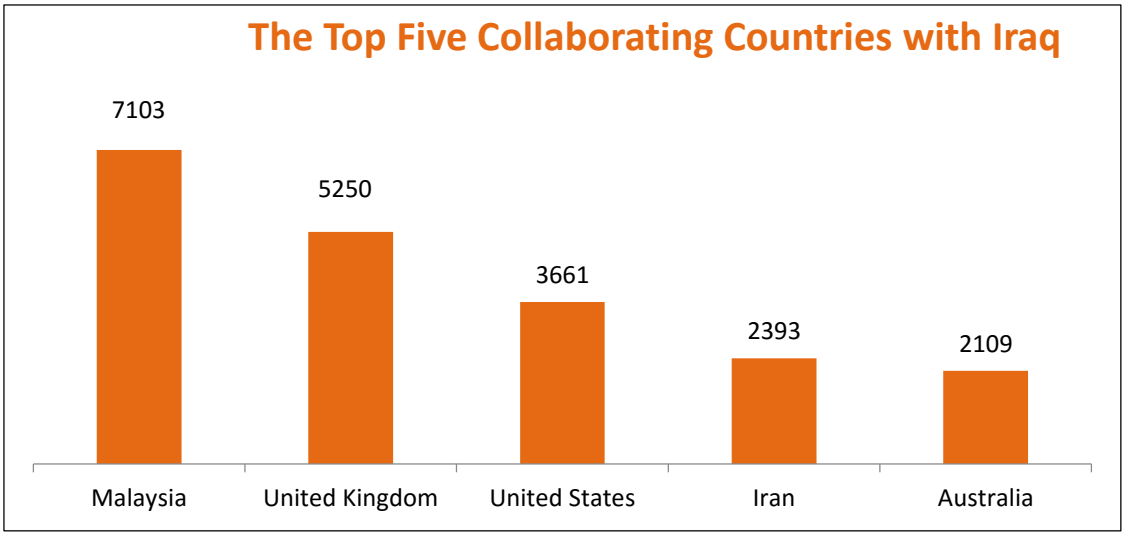
❖ Most Productive Universities

The list of some of the most productive universities with total publications, citations, CPP and FWCI is provided in the following table.

S#	AFFILIATION	SO	Citations	CPP	FWCI
1	University of Baghdad	13859	100088	7.2	0.77
2	University of Babylon	5952	43746	7.3	0.97
3	Al-Mustansiriyah University	5821	33123	5.7	0.72
4	University of Technology- Iraq	5402	52273	9.7	1.22
5	University of Kufa	4330	21730	5	0.66



- Iraq has published 33.1% documents in strong international collaboration. The rate of per year collaboration (from 2012 to 2021) is presented in the following figure.



- The data of the top five collaborating countries are presented in the above figure.
  The highest numbers of documents were published in strong collaboration with

1. Malaysia (n=7103),
2. UK (n=5250) and
3. USA (n=3661).

G. International Cooperation and Support Initiatives (selected)

❖ Governmental Cooperation

➢ New MoU Supports Digital Transformation in Iraq

The United Nations Development Programme (UNDP) is supporting the government of Iraq to strengthen its digital services and build its e-governance capabilities under a new Memorandum of Understanding (MoU) signed in July 2022 with Iraq's Council of Ministers Secretariat (ComSec).

The MoU focuses on harnessing and increasing the use of information and communication technology to modernize government processes and systems, improving services for citizens and boosting the digital economy. Under the MoU, an assessment of the digital landscape in Iraq and a subsequent roadmap for the main priorities of digital transformation will be developed. Forging new partnerships with the private sector to support for future digital transformation and e-governance projects is also highlighted in the MoU.

Source:https://iraq.un.org/en/192241-new-mou-supports-digital-transformation-iraq

➢ Zain Iraq signs a Memorandum of Understanding (MoU) with the Ministry of Science and Technology

In line with its commitment to enhance the IT sector and digital transformation to adjust to global standards, Zain Iraq, part of Zain group, a leading telecom innovator in the Middle East and North Africa (MENA), signed a Memorandum of Understanding (MoU) with the Ministry of Science and Technology. The agreement will provide digital solutions and modern applications to Iraqis, supporting the ongoing government efforts to offer electronic services and solutions that will impact the Iraqi lifestyle.

Source:https://www.iq.zain.com/en/zain-iraq-signs-a-memorandum-of-understanding-mou-with-the-ministry-of-science-and technology

➢ Iraq's Country Programme Framework (CPF) Iraq's Ministry of Higher

Education & Science and Technology and the IAEA have signed Iraq's Country Programme Framework (CPF) for the period of 2018–2023 on 1 June 2017. A CPF is the frame of reference for the medium-term planning of technical cooperation between a Member State and the IAEA and identifies priority areas where the transfer of nuclear technology and technical cooperation resources will be directed to support national development goals.

❖ SCIENTIFIC COOPERATION

➢ Iran, Iraq Ink Cooperation MoU

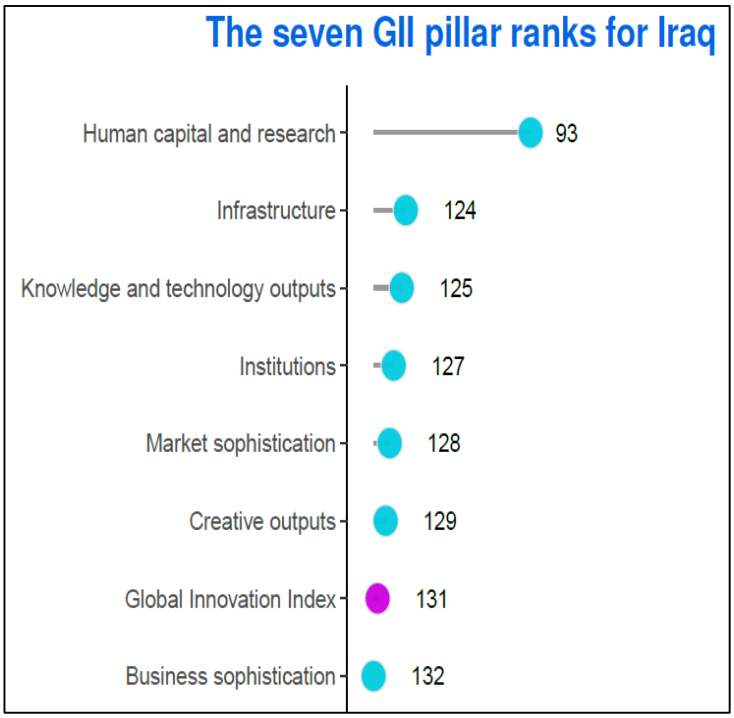
Iran and Iraq signed an agreement to bolster cooperation in scientific, technological and cultural areas. The countries have agreed for a large-scale program of student exchange as well the exchange of faculty members and publications. The most outstanding in the new memorandum of understanding (MoU) is the two sides' agreement for joint supervision of post-graduate students working on their masters or doctoral dissertations. Under the agreement, professors and students from both countries will be able to spend unspecified periods of time in each other's scientific institutions.

Source: https://www.gulanmedia.com/en/story/108500/1621543108-611-iran,-iraq-ink-cooperation-mou

H. INNOVATION, ENTREPRENEURSHIP & TECHNOLOGY PARKS

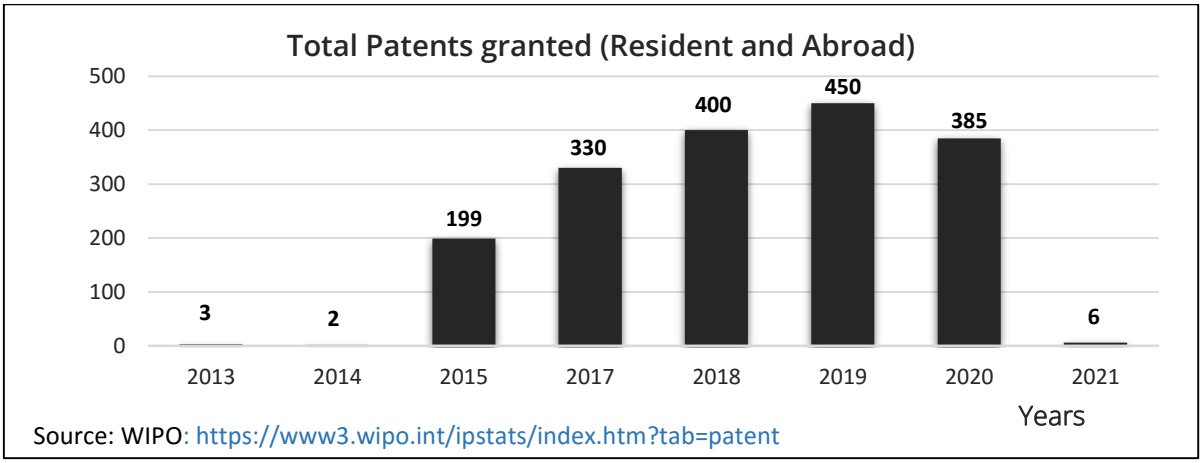
❖ The Global Innovation Index (GII)

The Global Innovation Index (GII) ranks world all economies according to their innovation capabilities. Consisting of roughly 80 indicators, grouped into innovation inputs and outputs, the GII aims to capture the multi-dimensional facets of innovation. Iraq's performance against various pillars in the box.



Overall Iraq ranks 131st among the 132 economies featured in the GII 2022, with a score of 11.9. Depicting a dire situation with regard to ecosystem required to facilitate entrepreneurship and innovation.

❖ Patent granted



Source: WIPO: https://www3.wipo.int/ipstats/index.htm?tab=patent

It is encourging to notice a consistent increasing trent. In the number of ranked patents between 2015 and 2019, declining however, in the COVID-19 years, 2020 and 2021.

❖ Incubation and Innovation Centres

➢ Business incubator in Basra University

Business incubators are support for free businesses by providing them with a set of support resources and services designed , managed by the incubator management, which either the incubator provides to the emerging companies directly or through a network of its relationships. The College of Science is among the five faculties at Basrah University , which enters into the partnership of the business incubator with Siraj Al-Maarifa Company for Training and Development. The activities of the first conference to activate the role of the business incubator, sponsored by the Basrah University and the United Nations World Food Program.

➢ Iranian House of Innovation and Technology

An Iranian house of innovation and technology inaugurated from July 3 to 6, in Sulaimaniyah, Iraq. The three business districts of "Kurdistan, Baghdad, and Basra" are considered as high-capacity areas for exporting Iranian knowledge-based and creative products.

I. COMBATING THE COVID-19 PANDEMIC

❖ Governmental Response

On January 28, a month before the first COVID-19 case in Iraq, a ministerial committee headed by the Minister of Health was established to advise the government on the situation and monitor the development of the events. On February 25, 2 days after reporting the first case, a crisis committee was established for each Iraqi governorate. Moreover, Ministry of Health (MOH) established a technical advisory committee composed of many experts from the universities and the retired specialists to provide technical advice. Later the Prime Minister's Office reformed the higher committee and established a new advisory committee.

❖ Containment Measures

➢ Border Control

Border control was one of the first measures used by the Iraqi government to contain the spread of COVID-19. Tightening the measures at airports and border crossings were declared by the government about 3 weeks before the first case was detected in Iraq. On 20 February 2020, Iraq banned travel to China, Iran, Japan, South Korea, Thailand, Singapore, Italy, Kuwait and Bahrain, as these countries reported a high number of COVID-19 cases. Countries were classified into two groups: Group A—high risk (coming from countries reporting >500 cases per million). Iraqi nationals returning from these countries went through a

medical examination and a quarantine for 14 days at medical centers. Group B—low risk (coming from countries reporting < 500 cases per million). Iraqi nationals returning from these countries went through a medical examination and COVID-19 tests. They were also required to sign an undertaking that is legally binding to observe self-isolation at home until the results come out.

➢ Curfew

A total curfew was imposed all over Iraq on March 17 and continued until April 20. During Ramadan, the curfew was partial on Sundays to Thursdays (from 7 p.m. to 6 a.m.) and total only on Fridays and Saturdays.

➢ Masks and Social Distancing Enforcement

Wearing masks in public was made obligatory, and the government declared that those not complying with the regulation will face legal consequences. Drivers of public transport vehicles were requested not to carry > 50% of the vehicle capacity and to be fined 50 000 dinars (US$41) for violating these rules. Passengers not wearing face masks would also subject drivers to fines. People not wearing face masks in public were fined 10 000 dinars (US$8). In shops and stores, only those wearing face masks are allowed in, 1 customer is allowed in every 5 square meters.

Other early measures included not allowing restaurants to open (except for delivery) and a ban on public gatherings. On July 7, all private clinics were closed for 2 weeks. Ironically though, after about a week of that decision, shopping centers and malls were allowed to reopen under strict conditions. By the end of July, private clinics were allowed to reopen as well, also under strict conditions.

➢ Case Detection and Tracing

At the beginning of the pandemic, patients were isolated at assigned health facilities, and contacts were quarantined at designated places. After the increase in reported cases, there was a shift in the policy; the quarantine of contacts was shifted to homes, and later the isolation of mild, moderate cases were made at home, leaving the hospitals for severe and critical cases. Later, with a further increase in cases requiring hospitalization that surpass the hospital's capacity and trending reports

of a shortage of different medical supplies including oxygen in the hospitals, there was a general shift of the patients with different levels of severity towards home isolation and management by private practitioners.

➢ Labs and Testing

At the beginning of the pandemic, there was full dependence on WHO in procuring PCR testing kits. Later, however, Kimadia (the state company for drug and medical appliances, Iraq Ministry of Health) started taking the lead. Before COVID-19, the Central Public Health Laboratory (CPHL) in Baghdad was the only center capable of performing PCR tests. As of October 2020, around 50 laboratories in Baghdad and all Iraqi governorates have Rt-PCR testing capacity.

➢ Iraq - High Frequency Phone Survey (IHFPS) to Monitor Impacts of COVID-19

Starting in August 2020, the World Bank in collaboration with the World Food Programme (WFP) began conducting a monthly phone survey to collect socioeconomic microdata to assess how Iraqis had fared during the COVID-19 pandemic on a nationally representative sample. Nationally, the survey suggests that the socioeconomic fallout of COVID-19 was severe for Iraqi households. While labor force participation was steady, unemployment rose during the pandemic.

Internally displaced Iraqis generally fared even worse. Unemployment was higher and educational engagement was lower for IDPs and returnees than non-displaced households. IDP households' food consumption deteriorated significantly. The welfare of IDPs living outside of camps was particularly concerning. Both displaced and non-displaced Iraqis were generally receptive to vaccination, but respondents indicated that they would be even more likely to accept a vaccine if it were recommended by the Government or employers.

Source:https://www.worldbank.org/en/country/iraq/publication/iraq-high-frequency-phone-survey-ihfps-to-monitor-impacts-of-covid-19-january-2021

COMSTECH Secretariat
33 - Constitution Avenue
G-5/2, Islamabad - 44000
Islamic Republic of Pakistan

Tele: 92-51-9220681-3
Fax: 92-51-9211115, 9205264
www.comstech.org

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