

Mapping Research and Innovation in the State of Kuwait

The first Report on the Implementation of the Recommendation
on Science and Scientific Researchers, UNESCO 2017





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on Science and Scientific Researchers, UNESCO 2017**

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Acronyms and Abbreviations

ACK	Australian College of Kuwait
AI	Artificial Intelligence
ASCC	Sheikh Abdullah Al-Salem Culture Center
ASEAN	Association of Southeast Asian Nations
AUK	American University of Kuwait
AUM	American University Middle East
CPI	Corruption Perception Index
CPI	Corruption Perception Index
CSB	Central Statistical Bureau
DDI	Dasman Diabetic Institute
FTE	Full Time Equivalent
GCC	Gulf Cooperative Council
GCI	Global Connectivity Index
GDP	Gross Domestic Products
GEDI	Global Entrepreneurship Index
GERD	Gross, Domestic Expenditure on Research and Development
GII	Global Innovation Index
GNI	Gross National Income
GPFA	Government Performance Follow-up Agency
GSSCPD	General Secretariat of the Supreme Council for Planning and Development
GUST	Gulf University for Science and Technology
HC	Head Count
HDI	Human Development Index
ICT	Information & Communication Technology

Acronyms and Abbreviations

IDI	ICT Development Index
IoT	Internet of Things
IP	Intellectual property
IPR	Intellectual Property Right
IPRT	International property Rights Index
IT	Information Technologies
JAC	Jaber Al Ahmed Molecular Imaging Center
KAPP	Kuwait Authority for Partnership Projects
KD	Kuwaiti Dinar
KDIPA	Kuwait Authority for Direct Investment Promotion Authority
KEPA	Kuwait Public Authority for Environment
KFAS	Kuwait Foundation for the Advancement of Sciences
KIC	Kuwait Innovation Center
KISR	Kuwait Institute for Scientific Research
KNDP	Kuwait National Development Plan
KOC	Kuwait Oil Company
KPC	Kuwait Petroleum Company
KPPC	Kuwait Public Policy Center
KRRP	Kuwait Research Review Panel
KSA	Kingdom of Saudi Arabia
KSC	Kuwait Science Club
KSIP	Kuwait National STI Policy
KSSTI	Kuwait Society for Science, Technology and Innovation
KSTIC	Kuwait Science, Technology, and Innovation Council

Acronyms and Abbreviations

KU	Kuwait University
M&E	Monitoring and Evaluation
MEW	Ministry of Electricity & Water
MOF	Ministry of Finance
MOH	Ministry of Health
MOP	Ministry of Planning
MOU	Memorandum of Understanding
MSMEs	Micro Small and Medium Sized Enterprises
NATO	North Atlantic Treaty Organization
NBAQ	National Bureau for Academic Accreditation and Education Quality Assurance
NGO	Non-Governmental Organization
NIS	National Innovation System
NOSD	National Observatory on Sustainable Development
NSDC	National Sustainable Development Committee
NTEC	National Technology Enterprise Company
OECD	Organization for Economic Co-Operation and Development
OPEC	Organization of the Petroleum Exporting Countries
PAAET	Public Authority for Applied Education and Training
PAAFR	Public Authority for Agriculture and Fish Resources
PAI	Public Authority for Industry
PPP\$	Purchasing Power Parity Dollars
PUC	Private University Council
PUL	Private University Law
R&D	Research and Development

Acronyms and Abbreviations

RI	Research Institute
S&T	Science and Technology
SACGC	Sabah Al Ahmad Center for Giftedness and Creativity
SC	Science Club
SDA	Sustainable Development Agenda
SDGs	Sustainable Development Goals
SESRIC	Statistical, Economic and Social Research and Training Center for Islamic Countries
SETI	Science, Engineering, Technology, and Innovation
SMEs	Small and Medium sized Enterprise
STEM	Science, Technology, Engineering, and Mathematics
STI	Science, Technology, and Innovation
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TED	Techno Economic Division
TF	Task Force
TI	Transparency International
TSCK	The Scientific Center Kuwait
UAE	United Arab Emirates
UIS	UNESCO Institute for Statistics
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
WIPO	World Intellectual Property Organization

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Foreword by H. E. Dr Mohamed Al Fares, Minister of Oil & Minister of Higher Education, State of Kuwait



Kuwait's Vision 2035

“To transform Kuwait into a financial and trade hub, attractive to investors, where the private sector leads the economy, creating competition and promoting production efficiency, under the umbrella of enabling government institutions, which accentuate values, safeguard social identity, and achieve human resource development, as well as balanced development, providing adequate infrastructure, advanced legislation, and inspiring business environment.”

Late Amir Sheikh Sabah Al Ahmad Al Jaber Al Sabah

Kuwait's Vision 2035 aspires to transform Kuwait into a regional and international financial and trade hub, appealing and engaging to investors. The main objective is for the private sector to lead the economy, create competition, and promote production efficiency. The Vision pictures a knowledge-based economy, where the private sector will have emerged as the driving force for wealth and opportunity; where the government operates efficiently and effectively to confront the country's most essential and crucial problems; where new infrastructures support a vibrant economy and healthy sustainable communities; and where the environment is not only protected but health is a priority given at most care and attention.

Meanwhile, considering that the Kuwait National Development Plan (KNDP) has stemmed from Kuwait's Vision 2035, it, therefore, necessitates the development of a clear, ambitious, and objective plan. Markedly, the government should be vigilant in its venture to raise its performance and channel national resources toward achieving the desired goals, alongside Science, Technology, and Innovation (STI), as key drivers to boost economic growth and resilience. Furthermore, KNDP envisions strengthening human and institutional R&D capacities in STI and enhancing social and ecological responsibilities for sustainable development.

Indeed, the call to action is timely and urgent. Accordingly, there is the need to continuously review and assess the achievements made in the national STI landscape and to act in a manner that research and development are not carried out in isolation, but as an explicit part of an integrated effort to elevate the culture, safeguard the welfare, and provide comfort and security for the citizens of both the present and future generations.

The Kuwait Government takes into consideration the lessons learned from the past and, from there, explores future technological advancement and innovation toward resolving Kuwait's national developmental challenges and progressing to achieve the country's aspirations.

In this report, the Government of Kuwait highlights the country's profile explicitly to review STI dimensions in Kuwait and map out future policies for STI toward strengthening the national framework and landscape in accordance with UNESCO 2017 guidelines.

In closing, I would like to thank the Chairman and Members of the Task Force Committee of Kuwait Institute for Scientific Research (KISR) for taking the lead in formulating this report and consolidated efforts and collecting data. Gratitude and appreciation are also extended and deeply expressed to the National Committee Members represented by STI Institutions of Kuwait for preparing this document and to the UNESCO Kuwait Office for the kind efforts, collaboration, and support.

A handwritten signature in blue ink, appearing to be 'M. Al Fares', written over a blue rectangular stamp or mark.

Dr. Mohamed Al Fares
Minister of Oil & Higher Education, State of Kuwait

Forward by Director of UNESCO Kuwait Office



After the adoption of the Recommendation by the General Conference of UNESCO on 20 November 1974 at its eighteenth session (Resolution 18 C/40). The General Conference, at its thirty-seventh session held in November 2013, affirmed the importance and full feasibility of the 1974 recommendation, and decided to review it by 2017 (resolution 37 C/40) to reflect the challenges facing those engaged in scientific research that have emerged over the forty years since its adoption to improve its effectiveness and monitoring. Since UNESCO works to strengthen scientific relations between the people of the world to achieve the common good of humans, which are the goals for which the United Nations and its affiliated organizations were established. We are pleased to present to you the measures taken by the State of Kuwait to collect the information, and data necessary for the preparation of the above-mentioned report in all ten main areas covered by the UNESCO Recommendation for Science and Scientific Research Personnel for the year 2017.

A working group was formed with the participation of many authorities, led by the Kuwait Institute of Scientific Research (KISR), to prepare this report, headed by Dr. Samira Omar Asem, and the Institute is the national focal point for follow-up and coordination between the participating and concerned authorities including Kuwait Foundation for the Advancement of Sciences (KFAS), Kuwait University (KU), Public Authority for Industry (PAI), Public Authority for Applied Education and Training (PAAET) and the Council of Private universities (CPU), the Ministry of Health (MOH), and the Kuwait Petroleum Corporation (KPC).

In conclusion, we thank you for your contribution. We value the efforts of the participants, and we hope for more progress and achievement in all fields that serve science and scientific research for the benefit of all mankind.

Secretary General
Mrs. Nadia Jassim Al-Wazzan
Secretary General
Kuwait National Commission for Education, Science and Culture





Executive Summary

Kuwait is a high-income country with GDP 134.6 billion USD (2019). The GDP per capita is 32,000.45 USD (2019). Kuwait was third highest in PPP\$ after Qatar and UAE with PPP\$ value 58,590. The economic transformation of the country and economic growth over the past five years (New Kuwait 2035) showing a Gross National Income (GNI) Per Capita (PPP\$) 58,590 PPP dollar (2018). The GDP growth rate was 0.4% annual change in 2019. Despite the economic growth, the unemployment rate-particularly youth unemployment- remains of concern to the government. The skills gaps in the labor market and the limited supply of training in technical skills are the challenges that have impacted unemployment.

The Human Development Index (HDI) score for Kuwait shows a decrease in the index over five years from 2014-2019, scoring 0.806 in 2019. The unemployment rate in Kuwait decreased to 2.30 percent in 2020 from 2.41 percent in 2019. For more than a decade, it never exceeded 0.4% of GDP except for the year 2014. The number of researchers per million inhabitants in Kuwait was 620 (out of which 61% are male researchers and 39% are female researchers). Kuwait GII is ranked 60th in 2018 and 2019, down four positions from 2017. The GII 2018 report shows that Kuwait performs better in innovation outputs than inputs. Kuwait is highly efficient in translating its innovation inputs into outputs, as demonstrated by the Innovation Efficiency Ratio, where Kuwait positions the 26th globally. The number of publications in Kuwait showed an increase from 861 in 2017 to 1004 in 2018. Patents in the Gulf Cooperation Council (GCC) for five years show Kuwait as the third highest in number after United Arab Emirates (UAE) and Kingdom of Saudi Arabia (KSA) with 45 patents in 2019.

Most of the R&D funding comes from the Ministry of Finance and funding agencies like the Kuwait Foundation for the Advancement of Sciences (KFAS). However, the Gross Domestic Expenditure on Research and Development (GERD) did not substantially increase in time, reaching up to 0.4% of GDP in 2014. There is a need to increasing the public funding to at least 0.6% of GDP by 2022, improving scientific excellence, and strengthening the link between R&D institutions and industry, in addition to Improving the educational system and international ranking.

Development of Human Capital for research and research commercialization, providing funds for scientific-technical activities, and proper infrastructure for technology parks (e.g., Shegaya Park for renewable energy), labs, and equipment are all measures that support the status of SETI in Kuwait. International internship schemes and partnerships are launching new measures of improving collaboration with international academic and research institutions. These are being encouraged in the R&D institutions in Kuwait, such as Kuwait Institute for Scientific Research (KISR), Kuwait University (KU), KFAS, and the Public Authority for Applied Education & Training (PAAET), and others.

Attempts to commercialize research outcomes have been slow due to the absence of a legal framework in addition to limited capabilities, knowledge, and experience in the valuation of intellectual property and the management of the negotiation process with the private sector or potential technology buyers. Kuwait is ranked low (83 out of 190 countries) in the World Bank data “Doing Business Ranking in 2020” scoring 67.4, whereas UAE ranked 16 with a score 80.9. Kuwait needs to do more to improve regulatory framework for doing business particularly relating to government bureaucracy, being a major hurdle for promoting innovation and competitiveness.

Recent records on Kuwait indices (2017-2018) showed weak scoring compared to other GCC. Country scores for relevant SETI indices showed the following values: 45 in the Global Connectivity Index (GCI); 5.98 in ICT Development Index (IDI); 42.8 in Global Entrepreneurship Index (GEDI), 34.4 in the Global Innovation Index (GII), 5.38 in the International Property Rights Index (IPRI). Kuwait needs to establish a monitoring and evaluation system to assess progress and strengthen its status in STI-related indices.



Executive Summary

Research institutions, such as KISR and KU, improved their international collaboration to encourage joint research projects, exchange of scientists, training and conducting workshops and conferences. Several MOUs were signed between KISR and KU with international research and academic institutions. Some successful abroad training programs were implemented in collaboration with the British Council in 2020 for training 19 scientists in UK. Kuwait also arranged its participation in the European Union's Horizon 2020 research financing scheme in collaboration with some European research institutions.

Kuwait has no Governmental structure for the co-ordination of the different SETI policies among the stakeholders such as: Kuwait Institute for Scientific Research (KISR), Kuwait University (KU), The Public Authority for Applied Education and Training (PAAET), Kuwait Petroleum Cooperation (KPC), Ministry of Health (MOH) and Public Authority for Industry (PAI). There is a need for a country holistic R&D framework involving the stakeholders of SETI systems and under the umbrella of the Council of Ministers. There is a need to establish a formal platform/STI policy for the government to work and coordinate to foster synergies and avoid duplication of efforts.

The major gaps in SETI in Kuwait is the lack of SETI policy. Recommendations and a list of priorities with proposed targets are shown as follows:

- The Government of Kuwait to design a fully-fledged SETI policy for the next ten years with the active involvement of the NIS stakeholders (Kuwait SETIP) and provide all necessary means to support its implementation by establishing a multi-stakeholder dialogue, dialogue with enhanced communication and information technology infrastructure capacity, design of a coherent SETI policy mix, and integration of SETI in other policy areas.
- Redistributing the roles and responsibilities among the NIS stakeholders involved in implementing policies, strategies, and measures for innovative development, considering principles such as segregation of duties, transparency, and effective coordination.
- Establishing and maintaining a balanced policy mix and evaluating and improving the existing SETI instruments and SETI infrastructures to achieve greater and sustainable impact and eliminate duplications.
- Strengthening the research institutes (RIs), particularly KISR, by implementing a comprehensive reform programme.
- The Government of Kuwait to continue its efforts in supporting SETI at high level with key elements that include:
 - Reviewing and revising the legislation system of Science, Technology, and Innovation.
 - Significantly enhanced funding of R&D and other STI activities, and the targeting of that funding to areas of greatest strategic significance to the country and supporting the Kuwait National Development Strategy.
 - Developing and implementing measures to continuously invest in skills and capacity building for teams responsible for policy, project, and programme design and implementation at the ministries and other agencies (including the management units of innovation infrastructures).
 - Female empowerment to achieve gender balance in SETI need to be pursued with a set of targets and empowerment schemes.
 - Establishing clear definitions for the concepts that concern SETI policies and creating a common understanding about them among all actors of the system.
- The identification and implementation of methods and strategies for increasing industry participation in SETI activities and the benefits of SETI investments.
- The identification and implementation of methods and strategies for enhancing cooperation and coordination of SETI activities at national, regional, and international levels.
- Popularizing STI through scientific institutions/Academic Sciences and media by using advanced and virtual technology tools to reach a wider audience in addition to networking through establishing science clubs and science cities, Non-Governmental Organizations (NGOs).



Executive Summary

Some aspiring targets are proposed as follows:

- Increase in R&D expenditure as percentage of GDP up to 1% by 2030 (GERD/GDP percent is 0.06% in 2018).
- Increase in number of researchers by 30% or more per million inhabitants by 2025.
- Increase in number of annual patents by 30% and improving GII ranking/scoring by 2025.
- Increase in number of technical journal publications by 30% by 2025.

To begin implementation of these recommendations, it is also recommended that the government appoint an implementation team from key SETI stakeholders to begin the preparatory work to launch the (Kuwait SETIP).



Acknowledgement

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This report is prepared in collaboration with UNESCO office in Kuwait and joined by several research institutions (RIs). Our special thanks extend to the following institutions/organizations: Kuwait Institute for Scientific Research (KISR), Kuwait University (KU), Kuwait Foundation for the Advancement of Sciences (KFAS), Ministry of Health (MOH), Ministry of Higher Education, Kuwait Oil Company (KOC), Public Authority for Applied Education and Training (PAAET), General Secretariat of the Supreme Council for Planning and Development (GSSCPD).

Our special thanks to H. E. Dr. Mohamed Al Fares/Minister of Oil & Higher Education for establishing a National Kuwait Committee for STI and for his encouragement and support that made it possible to complete the report on time. Acknowledgements are extended to the members of the National Committee for STI who worked tirelessly in a team spirit and on their efforts to following the UNESCO guidelines. Members of the National Committee for STI are as follows:

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Finally, our grateful thanks are extended to KISR administrators and images providers: Ms. Jenan Jamal and Mr. Bhyri Budhi Sagar, Eng W. Roy and Awad Al Dhafeeri.



Country Profile



The Flag of Kuwait¹



The Map of Kuwait²

Country	Country profile ³
	State of Kuwait
Region	Arabian Gulf Region
Boarder Countries	Iraq 254 km, Saudi Arabia 221 km.
Total Area	17,818 sq. km.
Boundaries	Total 499 km coastline 499 km.
Mean Elevation	108 m, highest point: 300m
Capital City	Kuwait City
Governance	Constitutional monarchy



Country Profile

Acknowledgement

GDP	134.6 billion USD (2019) ⁴
GDP per Capita	58,550 PPP USD (2018)
Resources	Crude oil representing almost 10% of global reserves
Population	4, 207,083 (2019) ⁴
Density of Population (Km ²) (2018)	237.2 ⁵
Life Expectancy at Birth (total years ⁶ in 2018)	75
Kuwait Nationals	30% of total population
Per Capita National Income	42,018 (2017) ⁵
Government Revenue, Current and Capital (in Mill. KD.)	13,283.1 (2017) ⁵
Government Expenditure (in Mill. KD)	19,352.0 (2017) ⁵
Ethnic Groups	Kuwaiti 31.3%, other Arab 27.9%, Asian 37.8%, African 1.9%, other 1.1%.
Elections/Appointments	National Assembly/Kuwait Parliament
Languages	Arabic and English
Main Religion	Islam
Unit of Currency	Kuwaiti Dinar
Independence Day	19 th June 1961
Invasion Day by Iraq	2 nd August 1990
Liberation Day	26 th February 1991
Inflation Rate	2.7%
Youth unemployment	27%
Women Leadership	13%
Adult Literacy Rate	96.06% (2018) ⁴
Rank & Score in the Corruption Perception Index ⁷ (CPI)	Rank: 76 th out of 180 countries (Rank 1 is best). Score: 42 out of 100 (score 100 is best).
Rank in the Network Readiness Index ⁷	81 st of 139 countries



1.0 Introduction

2.0 Background Information

3.0 Methodology

1.0 Introduction.

The report presents the Science, Engineering, Technology, and Innovation (SETI) country profile of the State of Kuwait in accordance with UNESCO 2017 decision on Recommendation on Science and Scientific Researchers. This UNESCO Recommendation was adopted by 195 states on 13 November 2017 during the 39th session of UNESCO General Conference and replaced the 1974 Recommendation on the Status of Scientific Research. The recommendation aims at research institutes, individuals, and scientific organizations that practice, regulate, and promote science. It calls on member states and their governments to create the conditions that will enable science to flourish and advance, to be practiced ethically and fairly, and to be useful and relevant to society.

The UNESCO recommendation calls upon members and governments to provide on a four-yearly basis starting (2017-2020) their national efforts and experiences in implementing the recommendation. It will be used as a tool for a better understanding of the science system, derive actionable insights, and accordingly take measures for advancing the science agenda for development.

This first report provided by the State of Kuwait is a self-assessment in which compliance is substantiated by documentation and references. It involves analysis that is based on data collected from different sources and consultation to assess the impact of policy measures that have been taken. The report is a collective effort from different research and academic institutions in the country that conduct Research & Development (R&D), practice innovation, and develop technology. These include the following organizations: Kuwait Institute for Scientific Research (KISR), Kuwait University (KU), Kuwait Foundation for the Advancement of Science (KFAS), the Public Authority for Applied Education and Training (PAAET), Kuwait Petroleum Cooperation (KPC), and the Ministry of Health (MOH).

The report is organized under the following eleven sections:

1. A long-term description of the political, economic, social, cultural, and educational contextual factors.
2. Analysis of gender in science and engineering national behaviour.
3. A study of R&D and innovation indicators.
4. A long-term scientometric analysis of scientific publications, patents, trademarks, and utility models.
5. Historical analysis of SETI policies and institutions
6. A standard content analysis of the explicit SETI policies, including those research and innovation policies implemented in other sectors, such as the agricultural, energy, health, industrial, and mining sectors.
7. A description of the SETI policy cycle.
8. A complete analysis of the SETI organizational chart at five different levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level).
9. An inventory of all the SETI government bodies and organizations related both to research and innovation and to science and technology services.
10. An inventory of the SETI legal framework, including acts, bills, regulations, and international agreements on SETI issues.
11. A SWOT analysis of the country's research and innovation landscape.

In each section, recent data was compiled from different sources to assess and evaluate the status and progress of SETI in Kuwait. Some data was difficult to attain in the short period of preparation of this report (one month). Alternatively, available institutional data was used as a case study with an indication that more data will be compiled in the future for further analysis and interpretation.



1.0 Introduction

2.0 Background Information

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2.0 Background Information.

Realizing the importance of science, engineering, technology, and innovation in achieving the 2030 Sustainable Development Agenda (SDA) and the Sustainable Development Goals (SDGs) of the United Nations, Kuwait has been challenged to meet their objectives, particularly due to the invasion of Kuwait in 1990-1991, which caused severe damages to the infrastructure, economy, demography, environment and the SETI landscape in the country. The UNESCO report 2015 estimated the Gross Domestic Expenditure on Research & Development (GERD) as a percentage of GDP increase in GERD/GDP in Kuwait (0.11 in 2009 to 0.3 in 2013). It also showed that the share of women researchers in 2013 was 37.3% in head counts. The publication intensity was 174 per million inhabitants in 2014 mostly in the field of Chemistry (cumulative 2008 -2014). The UNESCO 2015 report concluded that due to the Iraqi invasion in 1990, Kuwait showed significant deterioration in many STI-related indicators (UNESCO 2015).

The Government of Kuwait realized the impact of the Invasion and the Gulf War on the economy and STI landscape in Kuwait. In 2007, the Government formulated a Kuwait Research Review Panel (KRRP) to evaluate R&D and recommend priority goals to improve the STI status in Kuwait. In 2007, the Panel (known as the Blue Ribbon) submitted a very comprehensive report to the Government of Kuwait and recommended the formulation of STI policy. To create such a policy and assure its implementation, the Panel recommended the creation of a new, high-level governmental council (Kuwait Science, Technology, and Innovation Council (KSTIC) to coordinate the input and participation of a wide range of stakeholders in the STI system. Following the KRRP report, KISR initiated a project to create the STI policy and STI Council. A draft legislative act was prepared and presented to the Council of Ministers in 2011. However, due to financial constraints and the slumps in oil prices that followed, this recommendation was never implemented. An alternative suggestion was made by the Council to formulate a high-level Committee for STI in Kuwait. KISR, in collaboration with many STI-involved organizations, prepared the platform for the High-Level Committee for STI. However, the oil prices continued to fluctuate and impacted the country's annual budget, causing a delay and suspension in formulating the STI Supreme Committee/Council.

Kuwait University (KU) came into being in 1966 (Amiri decree 29/1966). Since its establishment, KU has witnessed a significant expansion in the number of colleges, reaching 16 Colleges. These are: Colleges of Science, Arts, Education, Law, Medicine, Engineering and Petroleum, Allied Health Sciences, Sharia and Islamic Studies, Business Administration, Pharmacy, Dentistry Social Science, Architecture, Computer Science and Engineering, and the Women College. As for graduate programs, the university currently offers 6 Ph.D. programs, 48 Masters, and 4 Higher Diploma programs in various disciplines. It is planned to offer new graduate studies programs to cover all the available bachelor's degree programs at Kuwait University. However, Kuwait University is primarily a teaching university with research currently playing a secondary role.

There are several institutions and organizations that conduct R&D and SETI in Kuwait. The Amiri Decree 28/1981 set up the chapter for KISR which was established in 1967 as an offset agreement with Japan's Arabian Oil Company Limited (Figure 1) as an independent research institute that conducts R&D in the field of energy, agriculture, fisheries, petroleum industry, water resources, and desalination, environment, techno-economic, information technology among many other fields. The institute provides consultations and services to the private and public sectors, contributes to sustainable development, and provides solutions for socio-economic benefits. KISR has been successful in establishing itself as a modern multipurpose applied R&D institution. It is also responsible for the formulation of the SETI policy in Kuwait, as indicated in the Amiri Decree 28/1981. KISR functions under the Board of Trustees headed by the Minister of Higher Education with members from many local institutions. KISR collaborates with local and international research and academic institutions to enhance its capacity and conduct joint research activities. Several MOUs were signed between KISR and international research and academic institutions. Some successful abroad training programs were implemented in collaboration with the British Council in 2020 for training 19 scientists in UK. KISR also arranged its participation in the European Union's Horizon 2020 research financing scheme in collaboration with some European research institutions. In more than 50 years, the institute



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developed its scientific capabilities, enhanced human resources, contributed to national developmental plans, and provided technical consultations to many local, regional, and international organizations. In 2010–2020 KISR developed its long-term strategic transformation with a vision to 2030. Research Centers of excellence were established to priorities R&D, innovation, and know-how development. A commercialization sector was established to link KISR research initiatives and outcomes with high priority economic and social development goals, such as commercialization and the development of SMEs.



Figure 1. Kuwait Institute for Scientific Research (KISR).

For the oil sector, KPC is involved with several activities promoting the SETI ecosystem. For the upstream, Kuwait Oil Company (KOC) has a mature technology management function responsible to scout, pilot and implement key and emerging technologies. KOC also is responsible for the R&D to develop new solutions for the challenges facing the upstream. Currently, this research is conducted in collaboration with leading local and international R&D organizations. However, at the same time, KOC is working to establish the Kuwait International Petroleum Research Center (KIPRC) for the upstream. The Center will cater for 21 research and technology management (R&D/TM) programs under 7 platforms. The Center will not only kick-start the in-house R&D for the upstream but will also bring together all the other elements of the R&D/TM (Figure 2) ecosystem including Collaboration, Technology Management and Capability Development.



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Vision of KIPRC Project

Executing Upstream R&D-TM Roadmap with state-of-the-art laboratories, scientists and collaboration partners



Figure 2. Vision of KIPRC Project

More recently, the SETI ecosystem was addressed by the Kuwait Foundation for the Advancement of Sciences (KFAS). The foundation was established by an Amiri Decree in December 1976 as a non-profit organization. KFAS Charter is mandated to provide financial support to research in basic and applied sciences, support projects of national priority; awards scientific prizes; organize scientific symposia and conferences; enrich the Arabic language library and promote scientific and cultural awareness. As part of KFAS mission to advocate science and encourage research, several Centers and companies were founded in Kuwait: These include the Scientific Center (TSCK), Sabah Al Ahmed Center for Giftedness and Creativity (SACGC), Jaber Al-Ahmed Molecular Imaging Center (JAC), Dasman Diabetes Institute (DDI), KFAS Academy for online learning and development and the Advancement of Sciences Publication and Distribution Company.

The Public Authority for Applied Education and Training (PAAET) was established as an independent body in December 1982 to provide and develop national manpower to fill the shortage of national technical manpower and to meet the developmental needs of the country. It contains two major sectors: applied education and training. The applied education sector encompasses five colleges: Basic Education, Technological Studies, Business Studies, Health Sciences, and Nursing. The training sector includes eight training institutes, namely: Higher Institute of Communications and Navigation, Higher Institute of Energy, Higher Institute of Administrative Services, Nursing Institute, Sabah Al-Salem Industrial Institute, Shuwaikh Industrial Institute, Training Institute, and Vocational Training Institute. PAAET is not mandated to carry out research for the sake of science advancement. Nevertheless, it is mandated to conduct applied research for the purpose of meeting the requirements of national development by means of technology and knowledge transfer adaptation and modification.



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The Public Authority for Industry (PAI) was established in January 1997. The Authority is an autonomous authority under the supervision of the Minister of Commerce & Industry. The main goal of PAI is to diversify national income sources, developing, promoting, and supervising the industrial activity in the State of Kuwait. In addition, PAI's concerns are to deepen the industrial awareness of the citizens and help propagate studies, coordinate between the existing industries and that proposed for future at GCC and Arabian countries and consolidates the industrial cooperation with different countries and international organizations.

In 2002, Kuwait Government established the National Technology Enterprise Company (NTEC) with the aim of investing in the commercialization of R&D, particularly of local output produced by R&D institutions such as KISR. NTEC is intended to work on an entirely commercial basis as a venture capital firm, investing in sectors witnessing intensive R&D activity and other sectors crucial to the country, e.g., ICT, energy, oil, water, and environment. NTEC invests, both in Kuwait and abroad, in water and environment technologies and continues to look at and develop further investment opportunities. However, NTEC appears to have a significant aversion to risk-taking. NTEC does not currently seem to support moving product prototypes from the lab and pilot stages to commercialization. This pattern admittedly reveals a gap in the commercialization system that needs to be bridged, and that should be addressed as part of the overall STI policy for Kuwait⁸.

In Kuwait, popularizing science, technology, and innovation is the responsibility of the Ministries of Education and the Ministry of Higher Education. The Ministry of Education supports the Science Club (SC), which was established early in 1974. The SC was set up as a non-profit, governmental organization with the general objectives to create a science and technology-oriented generation and to promote innovation. One of the significant contributions of the Science Club to Kuwait scientific development is the Astronomical Sciences Division, which possesses state-of-the-art facilities and well-trained personnel. The Society for Science, Technology and Innovation (KSSTI) was popularized in 2020 to enhance the public awareness on SETI and to promote scientific activities in the society.

Since Science and technology play a critical role in addressing contemporary challenges of development across multiple dimensions, including health, environment, food, water, and energy, and others, Kuwait officially endorsed the SDGs in September 2015. Kuwait set a National Sustainable Development Committee (NSDC) and the National Observatory on Sustainable Development (NOSD) to roll out the SDG Agenda as a national and participatory undertaking. The General Secretariat of the Supreme Council for Planning and Development (GSSCPD) with the Central Statistical Bureau (CSB) guided the process of mainstreaming the SDG within the quinquennial Kuwait National Development Plan (KNDP) and the national framework. The KNDP, which sets the nation's long-term development priorities, revolves around Shiekh Sabah Al Ahmad Al Jaber Al Sabah's, the late Emir of Kuwait's vision of a new Kuwait by 2035. The new Kuwait aims at achieving national prosperity and sustainability. The KNDP encompasses seven main pillars targeting transforming Kuwait into a leading regional financial, commercial, and cultural hub by 2035 (Figure 3). Kuwait aims to be among the top 35 percent countries by 2035 in twenty key global indicators and additional sub-indicators.

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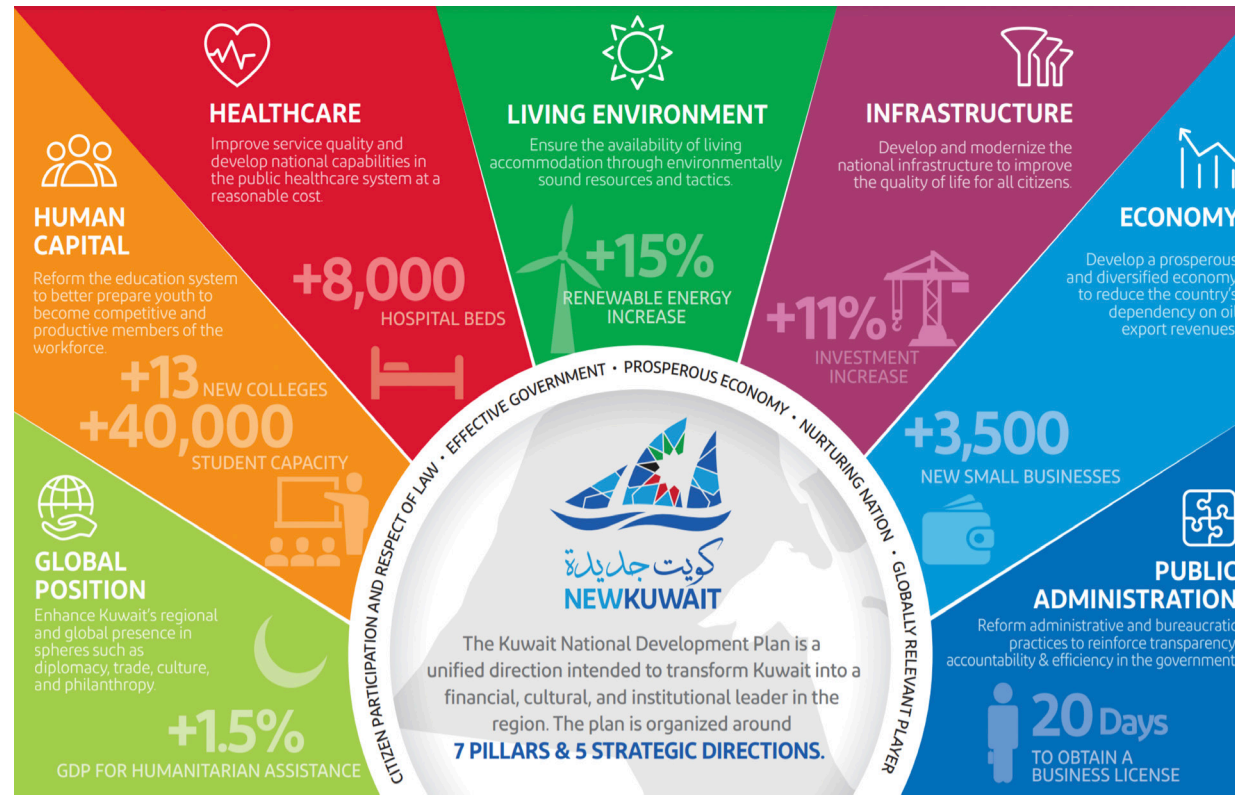


Figure 3. Kuwait's national development plan (New Kuwait 2035).

The pillars of the National Development Plan⁹ include the following:

- Sustainable, diversified economy.
- Effective civil service.
- Sustainable living environment.
- Developed infrastructure.
- High-quality healthcare.
- Creative human capital.
- Global positioning.



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All these pillars, in one way or another, can benefit from empowering SETI nationally.

Empowering SETI can facilitate realizing the strategic goals of the KNDP that are as follows:

Increase local productivity and development of non-oil economic sectors.

1. Improve standards of living for citizens.
2. Engage the private sector in the national economic activity of the country.
3. Support human and social development.
4. Improve residential policies to support development.
5. Train and qualify national human resources.
6. Enable government administration by restructuring government bodies.
7. Preserve the values of the Arab-Islamic identity.

Under the sustainable living environment pillar, there are 15 projects that aim at ensuring the availability of living accommodation through environmentally sound resources and tactics. These projects are under five main subcategories, including the maintenance of air quality, the improvement of the efficiency of waste and reuse management, providing housing welfare to the citizens, the utilization of renewable energy, and sewage water treatment. The projects include new city development, municipal waste treatment, air quality and pollution monitoring and control, water desalination, and a renewable energy complex.



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This report is prepared in response to UNESCO's request to provide the first national report on the implementation of the Recommendation on Science and Scientific Researchers in compliance with UNESCO Resolution 39 C/85 General Conference in 2017, revising a prior text on the same topic initially adopted in 1974. UNESCO provided guidelines for the preparation of the national report and a questionnaire to members to report on the progress made in Science, Technology, and Innovation (SETI) Policy. The Government of Kuwait, represented by the Ministry of Higher Education, established a focal point (A Standing National Committee for Preparation of UNESCO 2017 Recommendations on SETI) to prepare the country report. The National Committee was Chaired by the Kuwait Institute for Scientific Research and comprised of members from Kuwait University (KU), Kuwait Foundation for the Advancement of Sciences (KFAS), Public Authority for Applied Education and Training (PAAET), Kuwait Oil Company (KOC), and the General Secretariat of the Supreme Council for Planning and Development (GSSCPD). Ministry of Health (MOH) and the National Authority for Academic Accreditation and Quality Assurance of Education at Ministry of Higher Education.

Kuwait Institute for Scientific Research formulated a Task Force to expedite the preparation of the UNESC Report. The Task Force members are: Dr. Samira Omar Asem (Chairperson), Dr. Fotouh Al-Raqom, Dr. Faten Al-Jabsheh, Dr. Mohammed Hajeeh, and Mr. Khalid Al-Fares. Financial Information was provided by Ministry of Finance. Graduated Students Information were given from KU & PAAET.

4.0 A Long-Term description of the political, economic, social, cultural, and educational contextual factors.

Contextual factors determined by historical experiences and conditions, as well as the social and economic situation of a country, play an essential role in shaping the national and regional SETI ecosystems and the policy framework. This section presents brief background information about these factors.

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The Ministry of Higher Education is the top-level authority for STI landscape in Kuwait. Several organizations are involved in conducting R&D Activities. These include the following organizations: Kuwait Institute for Scientific Research (KISR), Kuwait University (KU), Kuwait Foundation for the Advancement of Science (KFAS), the Public Authority for Applied Education and Training (PAAET), Kuwait Petroleum Cooperation (KPC), and the Ministry of Health (MOH).

These institutions receive public and private funding from the private and government sectors. KFAS, a funding and SETI promoting institution, has been successful in enhancing harmony between R&D and the community challenges. It has effective experience in promoting the role of science in the national policy. However, one of the fundamental challenges, weaknesses and threats that face the research and innovation landscape in Kuwait is the absence of a national innovation and technology policy body to formulate and co-ordinate innovation policy in Kuwait, knowing very well that innovation governance at the national level has a significant impact on national innovation performance. This gap has created many challenges including lack of integrated SETI strategy, linkage between business/industry and R&D and academia, duplication of R&D efforts among institutions,



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4.1.2 R&D expenditure Government investment in R&D.

The Gross National Income (GNI) Per Capita (PPP\$) in 2017¹⁰ is shown in (Figure 4). Kuwait was third highest in PPP\$ after Qatar and UAE with PPP\$ value 58,590. However, according to the World Bank data, Kuwait's expenditure on STI (GERD) has been below 0.4% of GDP for many years except for the year 2014, which was valued at 0.43%. This could be due to oil price fluctuations per year as shown in (Figure 5)¹¹. Information from the Ministry of Finance in 2021 shows different values from the World Bank. The actual amount spent on Scientific Research in the State of Kuwait for the year 2015-2020 is shown in (Table 1)¹². These values are higher than the reported values by the World Bank due to inclusion of KISR expenditure on research. KISR is the main research institution in Kuwait and the annual budget is provided by the Ministry of Finance. More work is required to reduce discrepancies in data between the national records and the international organizations like the World Bank.

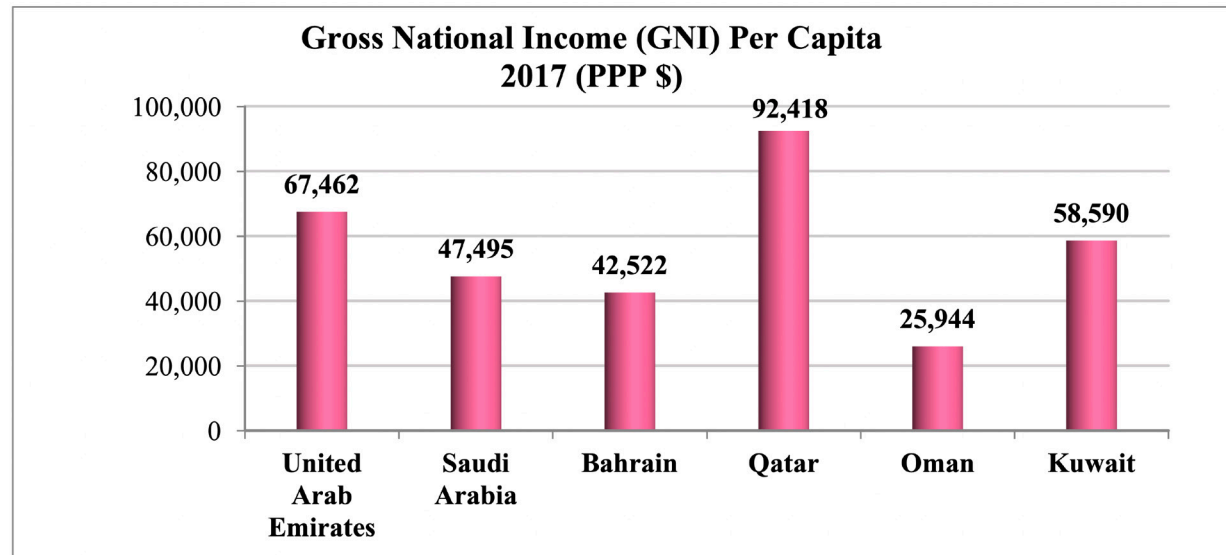


Figure 4. Gross National Income (GNI) Per Capita 2017 (PPP\$).

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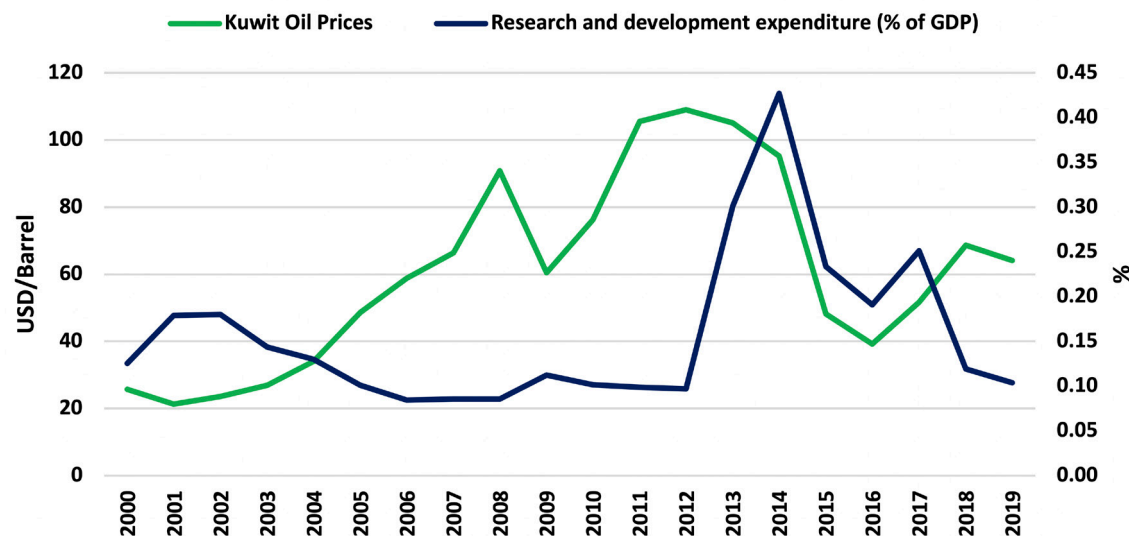


Figure 5. R&D Expenditure in % of GDP vs. Year in Kuwait (Ministry of Finance).

Actual Amount (KD) Spent on Scientific Research in the State of Kuwait in 2015-2020*					
	FY 2015/2016	FY 2016/2017	FY 2017/2018	FY 2018/2019	FY 2019/2020
Ministry of Justice	-	23,000	31,257.11	72,438.28	-
Kuwait University	5,496,000	652,000	3,041,000	3,621,000	3,833,000
PAAET	-	-	-	442,000	442,000
KPC	3,034,874	3,351,465	4,325,287	4,167,798	5,239,535
KISR	71,756,952	58,651,217	88,502,929	41,412,155	33,269,141
Total	80,287,826	62,677,682	95,900,473.11	49,715,391.28	42,783,676

* Ministry of Finance, Kuwait 2021.

Table 1. Amount (KD) spent on Scientific Research in the State of Kuwait (2015-2020).

4.2 Demographic records.

4.2.1 Population by gender and age including expats.

The population of Kuwait is estimated at 4,226,920 (2018)¹³. Women population is 1,639,192 (2018) about 38.8% of total population. Expats population in the same year was 2,923,674 about 69% of the total population. Population growth rate is 1.672 annual % (2019). Age distribution as percent of population was 2.76% (ages 65+), 75.67% (ages 15-64) and 21.57% (ages 0-14). Infant mortality rate is 6.8% per 1,000 live births (2019). Life expectancy at birth is 75.398 years (2018). The distribution of Kuwaiti population age 15 years + by education level and labor force is shown in Figure 6. The population outside the labor force was dominated by primary school holders, elementary and intermediate. Whereas those in the labor force were both above secondary and below university and university and above. This shows the market demand and employment for university and above degree holders is higher.

According to the UN human development index (HDI) (consisting of life expectancy index, education index, and income index), Kuwait's HDI score was 0.806 in 2020. Developed nations are those with HDI of 0.8 and above. According to the UN World Economic Situation and Prospects, Kuwait is classified as a developing country even though its HDI is above 0.8. The HDI for Kuwait is 0.793 (Female) and 0.807 (Male). The education index (average of mean years of schooling (of adults) and expected years of schooling (of children), both expressed as an index obtained by scaling with the corresponding maxima) for Kuwait, was 0.638 in 2019.

The education level among the Kuwaiti population indicates a high rate of literacy. Of those who are holding a university degree and above, 75.5% are in the labor force. Of those with above secondary level to below university education, 64% are in the labor force. Those with lower-level of educations, such as secondary level and below, are mainly out of the labor force as shown in (Figure 6)¹⁴.

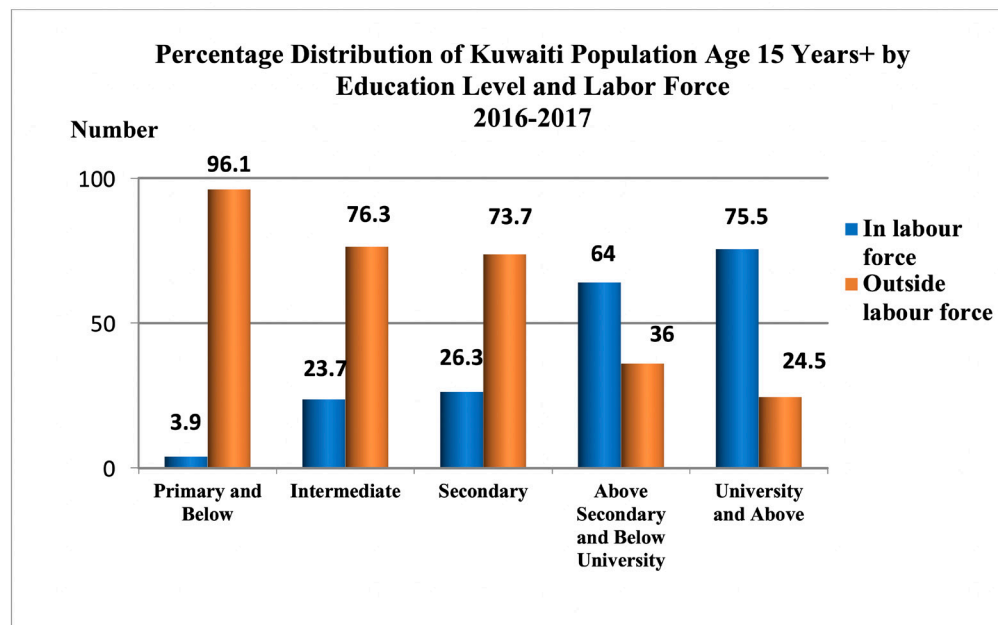
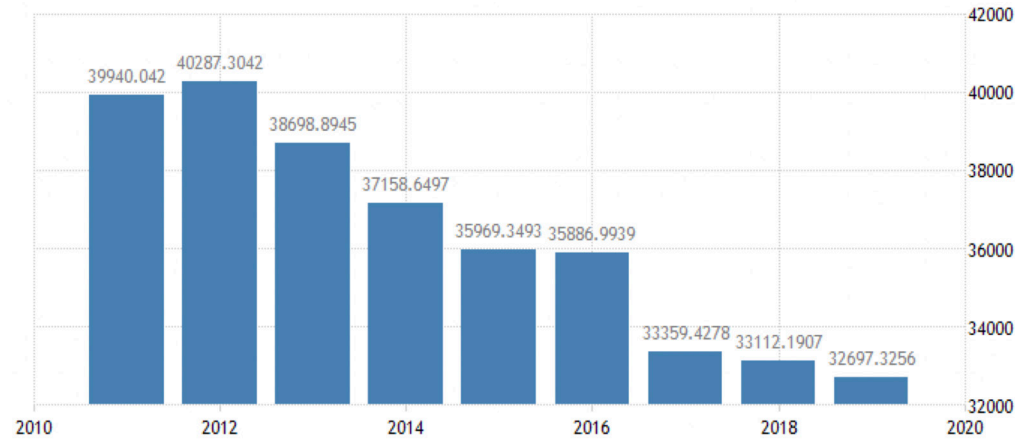


Figure 6. Percentage Distribution of Kuwaiti Population Age 15 Years + by Education Level and Labor Force (2016-2017).

4.2.2 GDP per capita and GDP growth in years.

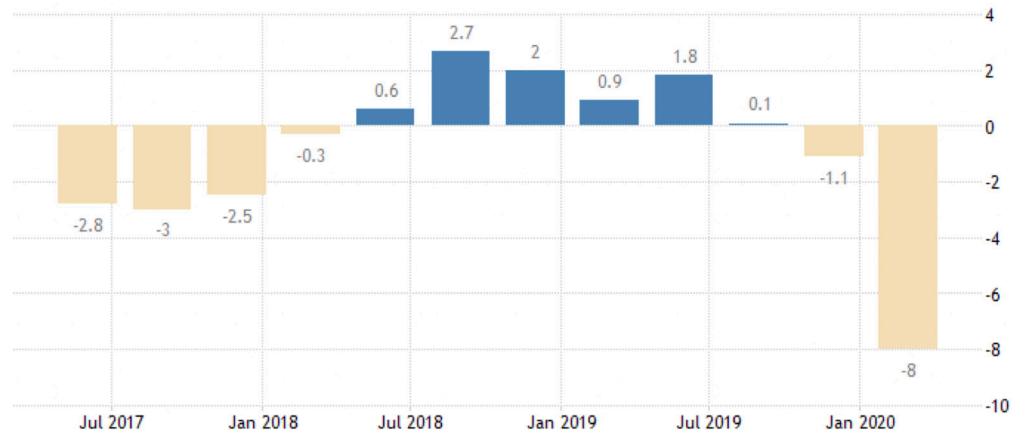
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Kuwait holds the world's sixth-highest reserves of oil, which account for 40% of GDP, 90% of total exports, and 80% of revenues. GDP was 134.76 USD Billion in 2019. GDP per Capita is shown in (Figure 7)¹⁵ which shows a decline since 2012. The annual GDP growth in years is displayed in (Figure 8)¹⁶ showing a negative value in 2020 rating -8%.



SOURCE: TRADINGECONOMICS.COM | WORLD BANK

Figure 7. Kuwait's GDP per capita per year in USD.



SOURCE: TRADINGECONOMICS.COM | KUWAIT CENTRAL STATISTICAL BUREAU

Figure 8. Kuwait's GDP Annual Growth Rate in years in percent.

4.2.3 Employment rate (% of adult population) by age and gender).

The labor force by nationality and gender is shown in (Figure 9)¹⁷ for 2020 census. The employment rate for total Kuwaiti and total non-Kuwaiti was 20.4% and 79.6%, respectively. Females' percentages were 57.7% Kuwaiti and 42.3% non-Kuwaitis. Males were 10.9 Kuwaitis and 89.1 non-Kuwaitis.

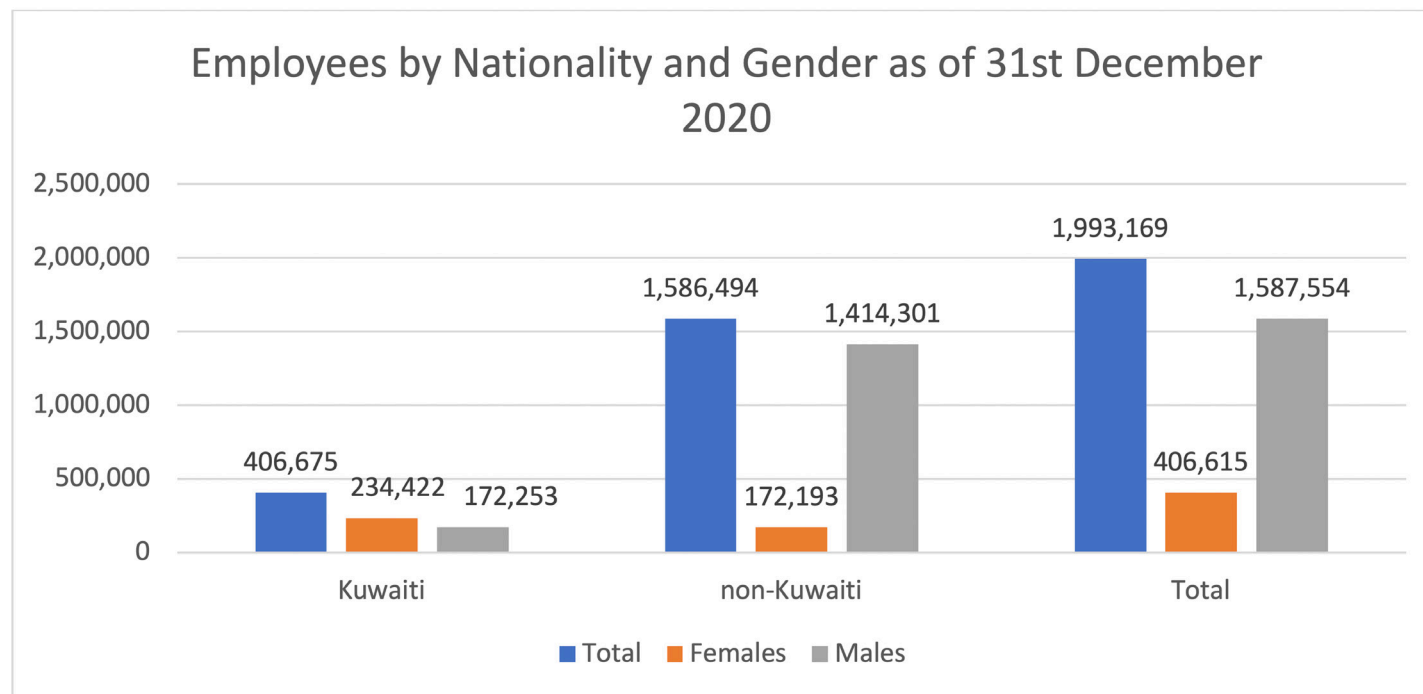


Figure 9. Labor Force by Nutritionally and Gender in Kuwait (2020).

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4.2.4 Unemployment rate (% of labor force) by age and gender.

The unemployment rate in Kuwait decreased to 2.30% in 2020 from 2.41% in 2019¹⁸.

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4.2.5 Oil Prices slumps (2025-2020).

The oil price annual fluctuation impacts the allocation of public funds for the government. (Figure 10) shows the annual fluctuation of crude oil price (USD) in years. The oil price in the period from 2010-2015 was above 100 USD per Barrel. The price in 2016 dropped to 20.28 USD and went up again but never reached 100 USD. The current price in 2021 is around 71.39 USD Per Barrel (June 4th, 2021)¹⁹.

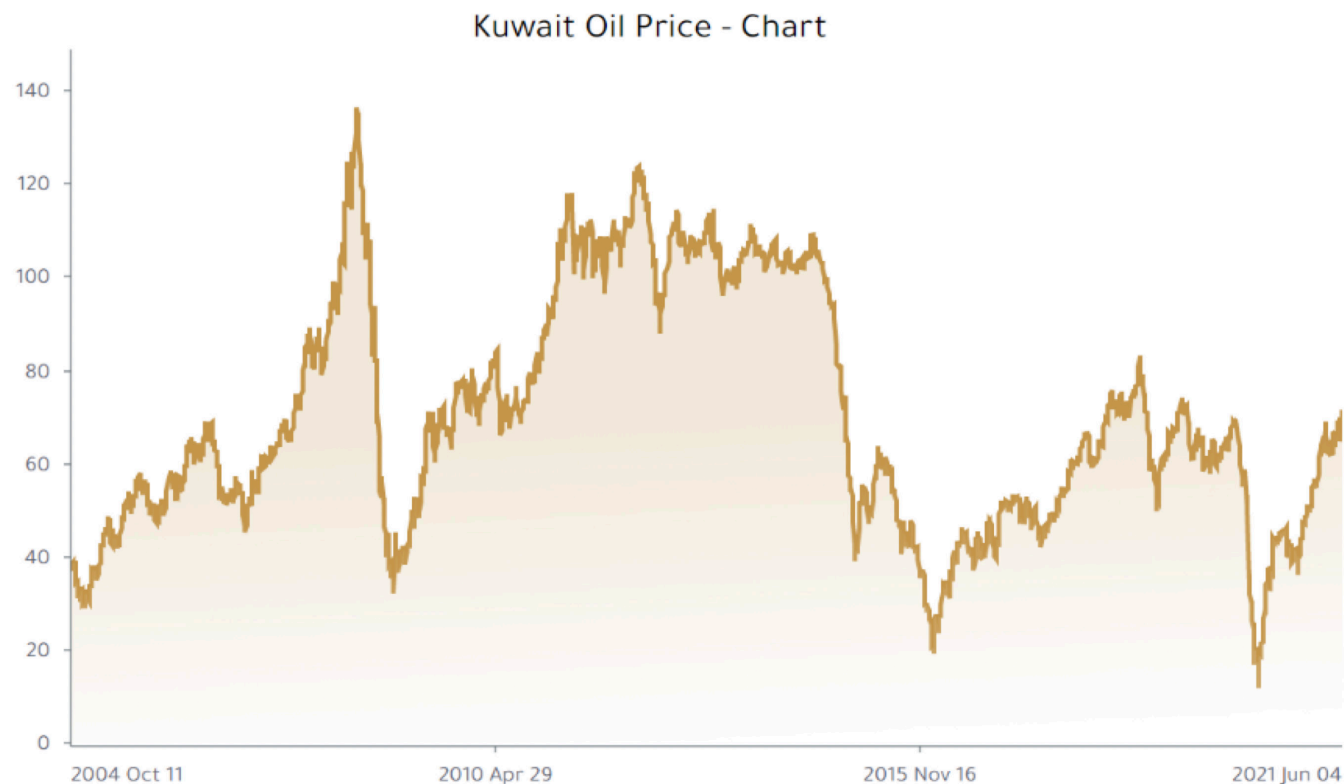


Figure 10. Kuwait Oil Price (USD) in years (2004-2020).

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4.3 Educational system and statistics.

4.3.1 School enrolment in Science and Engineering.

The newly admitted male and female students in Kuwait University²⁰ in selected colleges (for two semesters and both for Kuwaitis and non-Kuwaitis) in 2017/2018 is shown in Table 2. Female enrolment in science, engineering and petroleum and life sciences was higher than male counterparts. Females favored Life Science showing higher enrolment percentage (87.40%) than Engineering & Petroleum (77.59%) and Science (67.3%). Due to social pressures, females usually favor their college education in Kuwait. Information for student enrolment in SETI colleges include: Science, Engineering & Petroleum, Medicine, Dentistry, Allied Health Science, Pharmacy, Life Science, Architecture, Science & Computer Engineering, and Public Health is presented in Table 3. The total enrolled students in 2017/18 was 2623 with mostly females (male contributed 22.42% whereas, Female were 77.51). Females interest in science and engineering has been always over-seeding the number of males and for many years in Kuwait.

College	Gender		%
Science	Male	270	32.34
	Female	565	67.66
	Total	835	100.00
Engineering & Petroleum	Male	225	22.41
	Female	779	77.59
	Total	1004	100.00
Life Science	Male	33	12.6
	Female	229	87.40
	Total	262	100.00

Table 2. Newly enrolment in science and engineering in some selected colleges in 2017/2018.

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4.3 Educational system and statistics.

4.3.1 School enrolment in Science and Engineering.

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College	Gender	1 st Semester			2 nd Semester		
		Kuwaiti	Non-Kuwaiti	Total	Kuwaiti	Non-Kuwaiti	Total
Total	Male	277	121	398	158	32	190
	Female	1356	230	1586	388	59	447
	Total	1633	351	1984	546	93	639

*SETI colleges include: Science, Engineering & Petroleum, Medicine, Dentistry, Allied Health Science, Pharmacy, Life Science, Architecture, Science & Computer Engineering, and Public Health.

Table 3. Total enrolment of students in Kuwait University by selected SETI colleges*, gender, nationality, and semester during 2017/2018.

Student enrolment in the private universities and colleges in Kuwait is shown in Table 4. The information provided in Table 4 show that Kuwaiti enrolment (male & female) was higher than non-Kuwaitis (72.9%). Female enrolment was 53.7% for both Kuwaiti and non-Kuwaiti.

Nationality	Gender	Semester			Total
		First	Second	Summer	
Kuwaiti	Male	2647	584	106	3337
	Female	3247	517	119	3883
	Total	5894	1101	225	7220
Non-Kuwaiti	Male	815	389	48	1252
	Female	971	419	53	1443
	Total	1786	808	101	2695
Total	Male	3462	973	154	4589
	Female	4218	936	172	5326
	Total	7680	1909	326	9915

Table 4. Newly Admitted Students in Private Colleges & Universities by Nationality, Gender & Semester 2018/2019.

4.3.2 Number of graduated students by gender.

Kuwait University graduates by college, gender, semester, and nationality are presented in Table 5. Most of the students who graduated in 2017/2018 were females in the Engineering & petroleum college. There were only few graduates from the Life Science College and solely females. The male's and female's percentage graduate in science college were 30.37% and 69.63% respectively. The academic staff in Kuwait University in the following Colleges: Science, Medicine, Engineering & Petroleum, Life Science, Social Sciences, Architecture and Public Health and Allied Health Sciences were 929 of which 65.66% are females in 2019/2020.

College	Gender	Total	%
Science	Male	58	30.37
	Female	133	69.63
	Total	191	100.00
Engineering & Petroleum	Male	191	28.46
	Female	480	71.54
	Total	671	100.00
Life Science	M	0	0
	F	30	100.00
	Total	30	100.00

Table 5. University Graduates by gender and colleges (2017/2018).

Table 5S Shows Kuwait University graduates by college, gender, semester, and nationality in 2017/2018. This includes the following relative to SETI colleges (Science, Engineering & Petroleum, Medicine, Dentistry, Allied Health Science, Pharmacy, Life Science, Architecture, Science & Computer Engineering, and Public Health). The total number of graduated students were 1399 with 23.23% males and 77% females.

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4.3.2 Number of graduated students by gender.

The National Bureau for Academic Accreditation and Education Quality (NBAQ) owes its origin to the State's aspirations for developing, sustaining, and improving the quality of higher education in Kuwait through practices that safeguard and ensure the standards of academic credibility and State of Kuwait through continuous evaluation, (2) to determine the institutions of higher education in other countries for students to enroll in, according to NBAQ set standards, to maintain the quality of higher education in Kuwait.

The Foreign Scholarships Program of the Ministry of Higher Education in the State of Kuwait includes more than fifteen thousand students in various disciplines, most of which are in SETI in several countries around the world. The Ministry supervises them financially and academically through its cultural offices around the world. The scholarship fees include tuition, monthly living allowances, book allowances, tools. The budget of foreign missions in 2019 amounted to more than three hundred million Kuwaiti dinars (KD. 300,296,000).

College	Gender	1 st Semester			2 nd Semester		
		Kuwaiti	Non-Kuwaiti	Total	Kuwaiti	Non-Kuwaiti	Total
Total	Male	99	31	130	139	56	195
	Female	325	51	376	589	109	698
	Total	424	82	506	728	165	893

Table 6. Kuwait University Graduates by College, Gender, Semester and Nationality (2017/2018).

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The ethical dimension is tackled by SETI institutions. Independent committees are usually formulated to assess any ethical, legal, scientific, and social issues related to SETI. Relevant laws in the ethics of scientific research are listed as follows:

- Law 70 of 2020 regarding the practice of the medical profession and its auxiliary professions, the rights of patients and health facilities.
- Law No. 2 of 1998 approving the accession of the State of Kuwait to the agreement establishing the World Intellectual Property Organization.
- Law No. 64 of 1999 Concerning Intellectual Property Rights.
- Law No. 3 of 2006 regarding publications and publishing, as amended by Law No. 4 of 2016.
- Law No. 10 of 2007 regarding the protection of competition and the laws amending it.
- Law No. 35 of 2014 approving the accession of the State of Kuwait to the Berne Convention for the Protection of Literary and Artistic Works.
- Law No. (22) of 2016 Concerning Neighboring intellectual property rights and collective rights management.
- Law 75 of 2019. Concerning Neighboring intellectual property rights and collective rights management.



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4.5 Promoting SETI in the Society: Cultural and Scientific Knowledge.

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One of the main institutions promoting SETI in the Kuwait is the Kuwait Foundation for the Advancement of Sciences (KFAS). The Foundation is a non-profit organization that aims to stimulate and encourage advancement of SETI for the benefit of society, research and enterprise in the State of Kuwait. Local shareholding companies' have been committed to fund KFAS by contributing five percent of their net annual profits – reduced over the years to one percent – to serve this purpose. KFAS has built a remarkable record of strategic collaboration agreements with the world's biggest universities and research institutions. To advocate science and encourage research, several Centers and companies were founded by KFAS in Kuwait: These include the Scientific Center (TSCK), Sabah Al Ahmed Center for Giftedness and Creativity (SACGC), Jaber Al-Ahmed Molecular Imaging Center (JAC), Dasman Diabetes Institute (DDI). KFAS recognizes academicians and researchers and creates competition to enhance their productivity and achievements. Several prizes are awarded annually to acknowledge and recognize outstanding scientists locally and regionally. These are: Jaber Al-Ahmad Prize for Young Researchers, Kuwait Prize, Anwar Al Nouri Prize and Al Sumait Prize.



- **The Scientific Center Kuwait²¹ (TSCK)**

TSCK was presented to the citizens and visitors of Kuwait by Sheikh Jaber Al-Ahmed Al-Jaber Al-Sabah (God rest his soul). He was inspired to build the Center while overseeing the board meetings for The Kuwait Foundation for the Advancement of Sciences in 1992. The foundation aimed to create a hub where Kuwait could demonstrate its advancement and place in modern society, in addition to confirming its leadership role in the protection of the environment in the Arabian Peninsula. Inaugurated in 2000 to provide edutainment landscape in Kuwait, encourage the passion for, and simplify, the sciences and, eventually, promote the environmental awareness. TSCK is a cultural achievement and educational facility enriched with knowledge.

- **Sabah Al-Ahmad Center for Giftedness and Creativity^{22,23} (SACGC) – FabLab**

Sabah Al-Ahmad Center for Giftedness and Creativity (SACGC) was established in May 2010 as an initiative by the Late Sheikh Sabah Al-Ahmad Al-Sabah. The Center aims to nurture Kuwaiti individuals who have exceptional ability. The Center is dedicated to facilitating the integration of knowledge and intelligence by sponsoring gifted and creative individuals. This, in turn, will boost social, economic, and cultural development. Ultimately, it will develop full potential of Kuwaitis to lead productively and creatively and to convert the Center into a globally distinguished institution that cares for gifted and talented Kuwaitis.

- **Jaber Al-Ahmad Molecular Imaging Center²⁴ (JAC)**

The Jaber Al Ahmad Center for Molecular Imaging was established to translate the Foundation's objective of making the State of Kuwait a prominent regional destination in nuclear medicine and molecular imaging. The Center's main foundation objective was to provide a rich environment that supports the conduct of research and clinical trials, the training of specialists and technicians in nuclear medicine and molecular imaging as well as the production of the various radioactive materials and radiopharmaceuticals.

- **Advancement of Science Publication and Distribution company²⁵**

In 1984, this company was established as a publishing arm of KFAS. Its mandate is to popularize science, increase the public awareness of science and technology contemporary issues. Disseminating Science and Technology among the public in general and some other targeted groups is a corner stone in enhancing the national scientific capacity and strengthening the STI system of the nation. In recent years, there

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was much effort invested in enhancing the e-content through shifting to e-means and technology in obtaining and disseminating information relevant to science and technology in Arabic language. Communicating science is an important task, especially in societies that are still transforming towards knowledge economy.

- **Dasman Diabetes Institute²⁶(DDI)**

Established in 2006 to prevent, control and minimize the prevalence of diabetes and related health problems in Kuwait by adopting effective programs in the areas of research, training, education and health awareness to elevate the life quality in the country.
- **Kuwait Foundation for the advancement of Sciences (KFAS) Prizes:**
 - Jaber Al-Ahmad Prize for Young Researchers²⁷**

Established in 1988 in an initiative by His Highness the late Amir of the State of Kuwait Sheikh Jaber Al-Ahmad Al-Jaber Al-Sabah to encourage research intensity in Kuwait by recognizing distinguished Kuwaitis holding a PhD who are accomplished producers of scientific papers. The Prize fields are:

 - Physical Sciences and Mathematics.
 - Engineering Sciences.
 - Biological Sciences.
 - Medical Sciences and Allied Health Sciences.
 - Social Sciences and Humanities.
 - Administration and Economics.
 - **Kuwait Prize²⁸**

Aimed at recognizing the lifetime achievements of Arab scientists across the globe, this prestigious prize was introduced in 1979. The Kuwait prize has witnessed a surge of applications from Arab researchers everywhere, and is awarded in five fields, four of which are announced annually for Arabs (Basic Sciences, Applied Sciences, Economics and Social Sciences, Art and literature), and the fifth field, which is Arabic and Islamic Scientific Heritage - Science (Applied and Basic Science and Mathematics), is announced every third year for all nationalities.
 - **Anwar Al Nouri Prize²⁹**

KFAS oversees and fully manages the Anwar Al Nouri Prize, launched in 2015 and funded by the Anwar Al Nouri Philanthropic Trust. The award is given in recognition of the pivotal role the late educator played in the fields of education and learning in the State of Kuwait and the Arab world. The prize aims to enhance the quality of research in various fields related to the science of education in the Arab world. It also recognizes and acknowledges young researchers and outstanding Arab educators, as well as accelerating their progression in the educational field. The prize has a particular focus on those who will assume responsibilities in pedagogy, schools and educational research in the Arab world.
 - **Al Sumait Prize³⁰**

The Al-Sumait Prize for African Development is an initiative by The Amir of the State of Kuwait, His Highness Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah, which was announced at the “Third African Arab Summit” hosted by the State of Kuwait in November 2013 in honor of the late Dr. Abdulrahman Al-Sumait. The annual Al-Sumait Prize honors individuals or institutions that have through their work or research made significant advances in the fields of food security, health and education in Africa. The objective of the award is to recognize the finest studies, scientific projects, applied research and innovative initiatives that have had a significant impact and lasting influence on advancing Africa’s economic and social development.

4.5.2 Sheikh Abdullah Al-Salem Culture Center (ASCC).

The Sheikh Abdullah Al-Salem Cultural Center consists of six main components; The Natural History Museum, Science Museum, Space Museum, Arabic Islamic Science Museum, Fine Arts Center and the external spaces known as the Public Realm. The ASCC is a 18-hectare site making it the world's largest museum complex. The Sheikh Abdullah Al-Salem Cultural Center was inaugurated in early 2018, it was the world's largest single-delivery museum project.



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The Kuwaiti Scientific Club³¹ was founded in 08/11/1974. It is one of the very distinguished public benefit associations in the State of Kuwait. It is a non-profit organization that aims to attract creative and talented people of all ages and nationalities and to enhance their talents and creativity and affiliated with the Ministry of Social Affairs and Labor. The scientific club aims to:

- Sponsoring scientific activities and spreading scientific awareness.
- Working to raise the scientific level in cooperation with various clubs and scientific bodies.
- Creating and facilitating the appropriate atmosphere for club members to occupy their leisure time in a way that benefits them and their country.
- Documenting and strengthening the spirit of solidarity among club members, refining talents and directing them in the right direction.
- Participation in competitions, camps and scientific symposia and exchange visits and experiences with scientific club.



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4.5.4 Private and Non-Government Organizations

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- **Kuwait Innovation Center³² (KIC)**
The Center is recently established to assist developers and innovators. It provides digital fabrication services, prototypes services, training, mechanical & electrical engineering services, and product design. KIC launched multiple innovation boot-camps and programs for all age segments in Kuwait and graduated more than 40 innovators including some which implemented patentable ideas and projects.
- **Research & Innovation Center, the American University of the Middle East³³ (AUM)**
The AUM Research & Innovation Center was launched to undertake economic and strategic research initiatives, support the development of the economic system in Kuwait and the Gulf region, and hold conferences, seminars and events that address economic challenges towards development.
- **Kuwait Society for Science, Technology and Innovation (KSSTI)**
The Society was popularized in December 6th, 2020. The objectives of the society are: enhancement of public awareness on science, technology, and innovation; setting development strategies and plans and public policies related to scientific research activities, innovation, and technology transfer; communicate and coordinate with the executive and legislative authorities to provide more financial support and morale for science, technology, and innovation activities; encouraging individuals and local companies to benefit from the outputs of scientific and technical; encouraging youth to study science and mathematics and specialize in all scientific fields and engineering. Organizing conferences, seminars, and enlightening meetings, and participating at all levels local, regional, and global representation of the State of Kuwait in international forums.
- **Private Universities**
There are many private universities in Kuwait that promote SETI education. Among these are the following: Gulf University for Science and Technology (GUST), American University of Kuwait (AUK), Australian College of Kuwait (ACK), American University Middle East (AUM). These Universities are established under the Private University Council of Kuwait (PUC), which is a government institution ensuring conformity with all rules and stipulations for licensing private educational institutions in Kuwait.



4.5.5 Reformation of social and economic strategy (privatization, FDI, SME, etc.)

4.0 A Long-Term description of the political, economic, social, cultural, and educational contextual factors.

4.1 SETI Systems and Governance.

4.1.1 National Policy for SETI

4.1.2 R&D expenditure
Government investment in R&D and researchers.

4.2 Demographic records.

4.2.1 Population by gender and age including expats.

4.2.2 GDP per capita and GDP growth in years.

4.2.3 Employment rate (% of adult population) by age and gender).

4.2.4 Unemployment rate (% of labor force) by age and gender.

4.2.5 Oil Prices slumps (2020-2025).

4.3 Educational system and statistics.

4.3.1 School enrolment in Science and Engineering.

4.3.2 Number of graduated students by gender.

4.4 The Ethics of Science and Intellectual Property

4.5 Promoting SETI in the Society: Cultural and Scientific Knowledge

4.5.1 Kuwait Foundation for the Advancement of Science (KFAS)

4.5.2 Sheikh Abdullah Al-Salem Culture Center (ASCC)

4.5.3 The Kuwait Science Club (KSC)

4.5.4 Private and Non-Government Organizations

4.5.5 Reformation of social and economic strategy (privatization, FDI, SME, etc.)

Kuwait Vision 2035 aims to transfer Kuwait into a financial and trade hub regionally and internationally, where the private sector leads the economy creating competition and promoting production efficiency³. The objectives of this plan were to raise government performance and channel national resources towards achieving the desired goals. The Kuwait's national Development Plan is linked to Sustainable Development Goals (SDGs) 2030 agenda. One inspiration of the Vision include: "Providing new infrastructure, appropriate legislation and an enabling a business environment conducive to development and providing controls and climate to ensure total and balanced human resource development. Aiming on consolidating the values of society, preserving its identity, as well as achieving justice, political participation and freedoms". Kuwait established new bodies to enable economic growth and business environment.



Al Kout Mall

5.0 Analysis of gender in science and engineering national behavior.

- 5.1 The Gender Development Index (GDI).
- 5.2 Innovation Rate
- 5.3 Internet Users and mobiles.
- 5.4 Kuwait Indices relevant to SEIT.

5.0 Analysis of gender in science and engineering national behavior.

The fact sheets of UNESCO Institute for Statistics (UIS) show the gender gap in science. Their data are presented in headcounts (HC), which are total number of persons employed in R&D. This includes staff employed both full time and part-time. The regional average for the share of female researchers for 2017 in the Arab States was 40.9%. Kuwait showed 58.6% female researchers as percentage of total researchers in Kuwait (HC).

Information on gender contribution to R&D at Kuwait Institute for Scientific Research (KISR) shows that women as percentage of total researchers (Kuwaiti and non-Kuwaiti HC) contributed to 46.02 % in 2019/2020. The total number of researchers (Kuwaiti and non-Kuwaiti) holding PhD in the institute were 190 for the same physical year (22% of total researchers).



5.0 Analysis of gender i science and engineering-national behavior.

5.1 The Gender Development Index (GDI).

5.2 Innovation Rate

5.3 Internet Users and mbiles.

5.4 Kuwait Indices relevant to SEIT.

5.1 The Gender Development Index (GDI).

Under the Ninth Sustainable Development Goal (SDG 9), countries have pledged to “build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”. Target 9.5 calls upon them to encourage innovation and substantially, increase the number of researchers, as well as public and private spending on research and experimental development. Countries have pledged to increase public and private R&D spending and the number of researchers by 2030*.

(Figure 11) illustrates the distribution of researchers per 1 million inhabitants in the world (UIS 2020) showing Kuwait is within the 300-1000 range. The data are expressed in full-time equivalents (FTE), which is a measure of the actual volume of human resources devoted to R&D³⁴. In 2020, the number of researchers per million inhabitants in Kuwait was 620 (out of which 61% are male researchers and 39% are female researchers). This number includes full-time and part-time researchers.

R&D spending as % GDP in Kuwait was 0.4% (UIS 2020) (Figure 12). The republic of Korea showed highest world spending in 2020 as % of GDP (4.1) with 6,826 number of researchers in one million inhabitants³⁵.

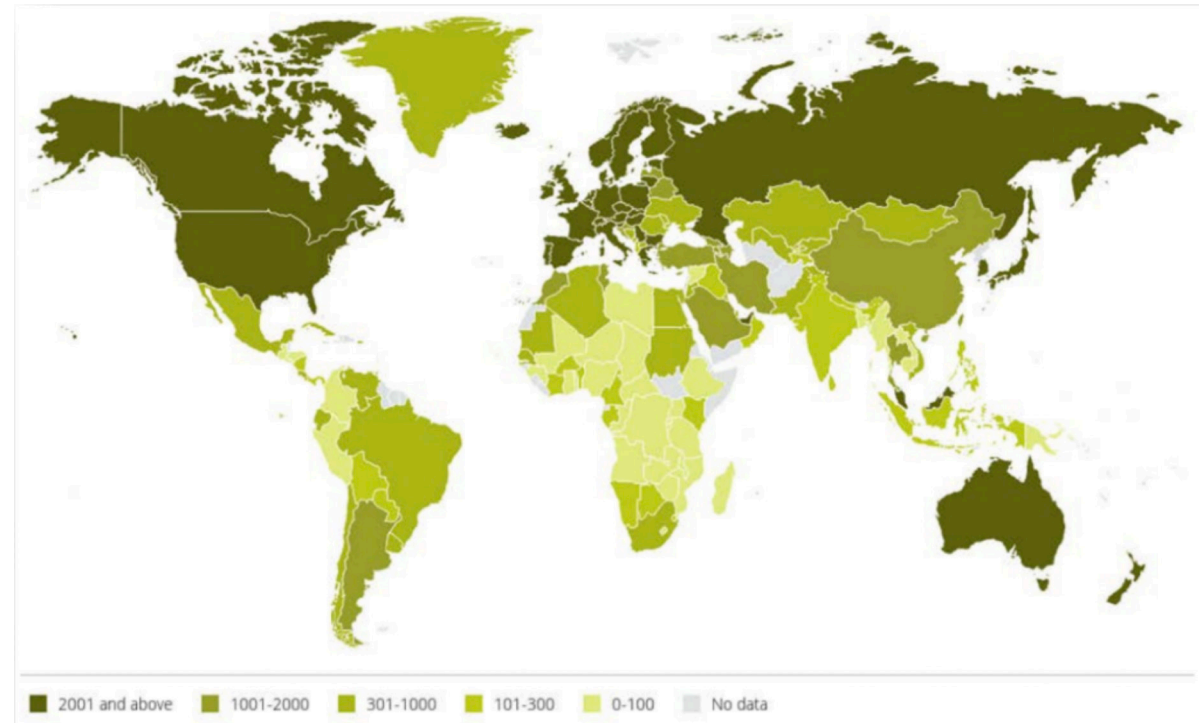


Figure 11. World distribution of researchers per million inhabitants (UIS 2020).

5.1 The Gender Development Index (GDI).

5.0 Analysis of gender i
science and engineering-
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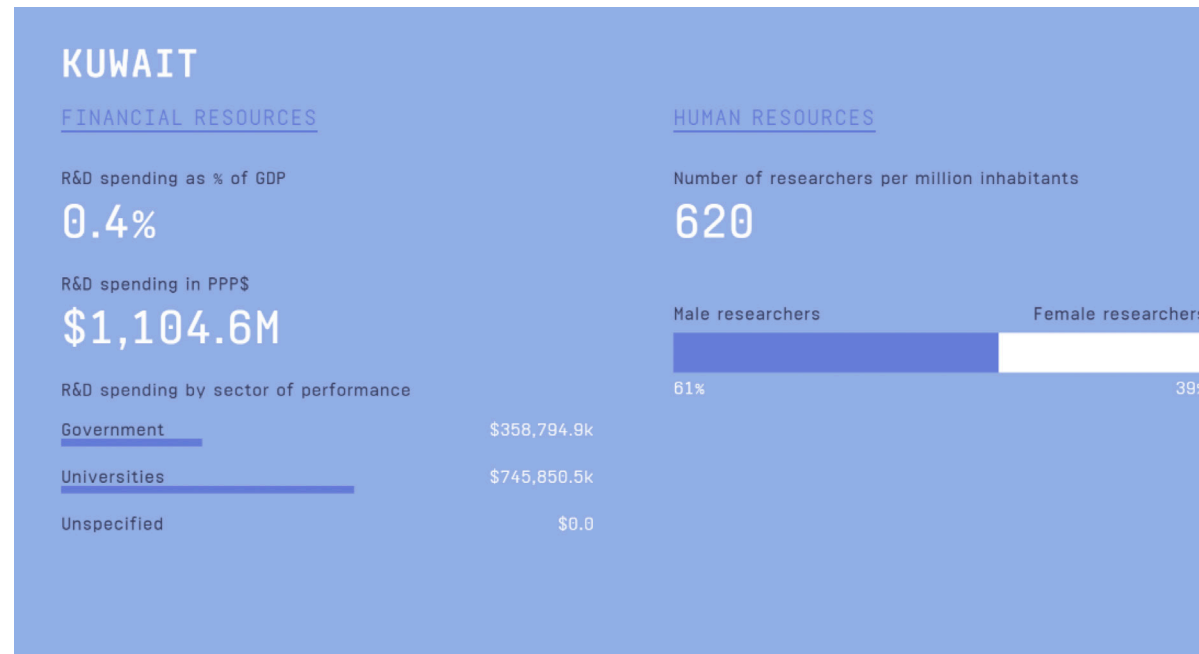


Figure 12. Researchers Per Million Inhabitants and R&D Expenditure as % of GDP in Kuwait



5.2 Innovation Rate.

The World Intellectual Property Organization (WIPO)³⁶ and the Global Innovation Index (GII) for several years show that Kuwait is ranked 60th in 2018 and 2019, down four positions from 2017 (Table 7). The GII indicators are grouped into innovation inputs and outputs. The GII 2018 report shows that Kuwait performs better in innovation outputs than inputs. In 2018 Kuwait ranked 49th in innovation outputs dropping four positions from 2017. Kuwait is highly efficient in translating its innovation inputs into outputs, as demonstrated by the innovation Efficiency Ratio, where Kuwait positions the 26th globally. In the Efficiency Ratio (26th) it ranks much better than in the overall GII (60th). This is partly influenced by a much higher ranking in innovation outputs (49th) than inputs (81st).

Year	GII	Input	Output	Efficiency
2020	78	73	79	NA
2019	60	75	59	NA
2018	60	81	49	26
2017	56	80	45	18
2016	67	78	56	42

Table 7. Kuwait's ranking in GII over time.

5.0 Analysis of gender i science and engineering-national behavior.

5.1 The Gender Development Index (GDI).

5.2 Innovation Rate

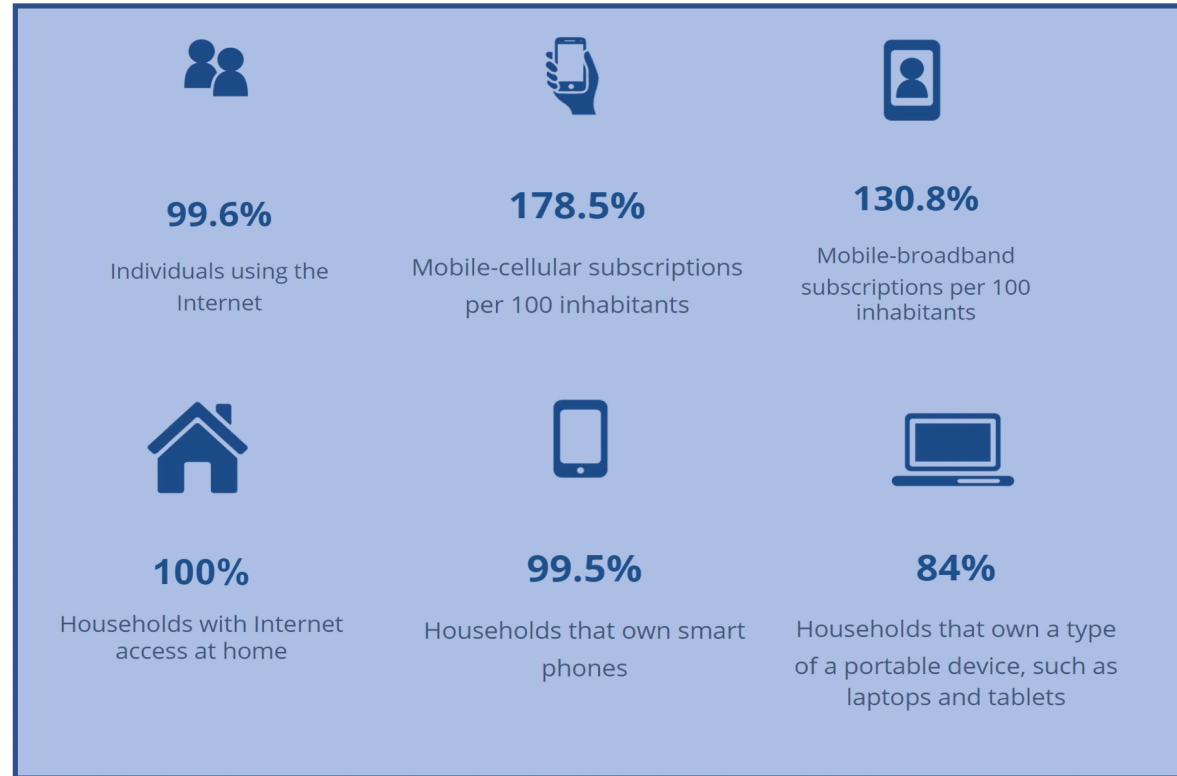
5.3 Internet Users and mbiles.

5.4 Kuwait Indices relevant to SEIT.



5.3 Internet Users and mobiles.

Number of cellular telephones in Kuwait is estimated at 7,099,848 (2018). Internet users were estimated at 2,219,972 (2016). This, however, is expected to increase dramatically in 2020 and 2021 during the pandemic COVID19. More recent estimates need to be collated³⁷.



Kuwait National ICT Figures

5.0 Analysis of gender i science and engineering-national behavior.

5.1 The Gender Development Index (GDI).

5.2 Innovation Rate

5.3 Internet Users and mbiles.

5.4 Kuwait Indices relevant to SEIT.

5.0 Analysis of gender i
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Index (GDI).

5.2 Innovation Rate

5.3 Internet Users and
mbiles.

5.4 Kuwait Indices relevant to SEIT.

5.4 Kuwait Indices relevant to SEIT.

- **Global Connectivity Index (GCI)³⁷.**

The GCI was created to analyse a broad spectrum of indicators for ICT infrastructure and digital transformation to provide a comprehensive map of the global digital economy. The GCI is a unique quantitative assessment that comprehensively and objectively evaluates connectivity from both a national and industrial perspective. Globally Kuwait scored 45 in 2018 ranking 37 out of 79 countries, whereas other Gulf Countries scored as follows (note: the higher the score the better (USA is 78)): UAE 53, Bahrain 45, Saudi Arabia 44, Oman 42). Kuwait needs to monitor its technologies regularly to map its performance in global digital economy (supply, demand, experience, and potential chains of ICT). SETI institutions are planning for a digital transformation to contribute in improving Kuwait's GCI. Efforts for "Big Data", and Artificial Intelligence (AI), Broadband, Cloud, Internet of Things (IoT) have been initiated in Kuwait Institute for Scientific Research in the 9th Strategic Plan (2020-2025).

- **ICT Development Index (IDI)³⁸.**

The IDI is used to monitor and compare developments in information and communication technology (ICT) between countries and over time. Kuwait score was 5.98 in 2017 ranking 71 out of 176 countries. Other Gulf countries scored as follows in order of best/higher score: Bahrain 7.6, UAE 7.21, Qatar 7.2, Saudi Arabia 6.67, Oman 6.43. Kuwait needs to evaluate IDI status to improve its global ranking in ICT. It needs to monitor the progress in ICT development and its development potential. There are three ICT stages model used in this index. These are: ICT readiness-reflecting the level of networked infrastructure and access to ICTs; ICT intensity-reflecting the level of use of ICTs in the society; and ICT impact-reflecting the results/outcomes of more efficient and effective ICT use. The outcomes of these three stages reflects the ICT impact in a country. Kuwait needs to consider the three stages to improve the score of IDI.

- **The Global Entrepreneurship Index (GEDI)³⁹.**

The GEDI includes aspects such as broadband commutatively and the transport links to external markets. GEDI uses 14 pillars to measure the health of the regional ecosystems. Kuwait score was 42.8 in 2018 ranking 39 out of 137 countries. Other Gulf Countries scored as follows: Qatar 55, UAE 53.5, Oman 46.9, Bahrain 45.1, Saudi Arabia 40.2. Kuwait needs to monitor its performance on the entrepreneurial attitudes, abilities, and aspirations of local population against the prevailing social and economic infrastructure.

- **The Global Innovation Index⁴⁰ (GII).**

The GII provides detailed metrics about the innovation performance of 127 countries and economies around the world. Kuwait scored 34.4 in 2018 ranking 60 out of 126 countries. Switzerland score was the highest 68.4 (ranked number 1 out of 126 countries). Other Gulf Countries scored as follows: UAE 42.6, Qatar 36.6, Oman 32.8, Bahrain 31.7). Kuwait needs to monitor the GII which has 81 indicators that explore a broad vision of innovation, including political environment, education, infrastructure, and business sophistication.

- **International Property Rights Index⁴¹ (IPRI).**

The International Property Rights Index (IPRI) is an economic index study on the correlation between economic success and property rights. It is a tool for policymakers, business communities, and civic activists the IPRI highlights the essential role property rights play in creating a prosperous economy and just society. In addition, the 2020 Index examines the robust relationship between property rights and other economic and social indicators of well-being including-gender equality, entrepreneurship, research and development, human development, civic activism, and measures of internet connectedness. Kuwait scored 5.38 ranking 61 out of 127 countries. All other Gulf countries' scores were higher (UAE 7.84, Qatar 7.35, Bahrain 6.16, Saudi Arabia 6.13, Oman 6.28). Kuwait needs to put more efforts to improve the property rights system including intellectual and physical property rights.

6.0 A long term scientometric analysis of scientific publications, patents, trademarks, and utility models.

6.1 Scientific Publications, Publication in High-impact journal & Number of citations/ Citation rate.

6.0 A long term scientometric analysis of scientific publications, patents, trademarks, and utility models.

6.1 Scientific Publications, Publication in High-impact journal & Number of citations/ Citation rate.

6.2 Patents (Intellectual property (IP)).

The number of scientific and technical journals published in Kuwait in the past five years is shown in (Figure 13). The number of publications in Kuwait showed an increase in 2018 amounting 1004. Research institutions, such as KISR and KU rate these publications based on their quality (Q1, Q2, Q3) and journal impact. Citation records are also considered as measures in STI indicators⁴².

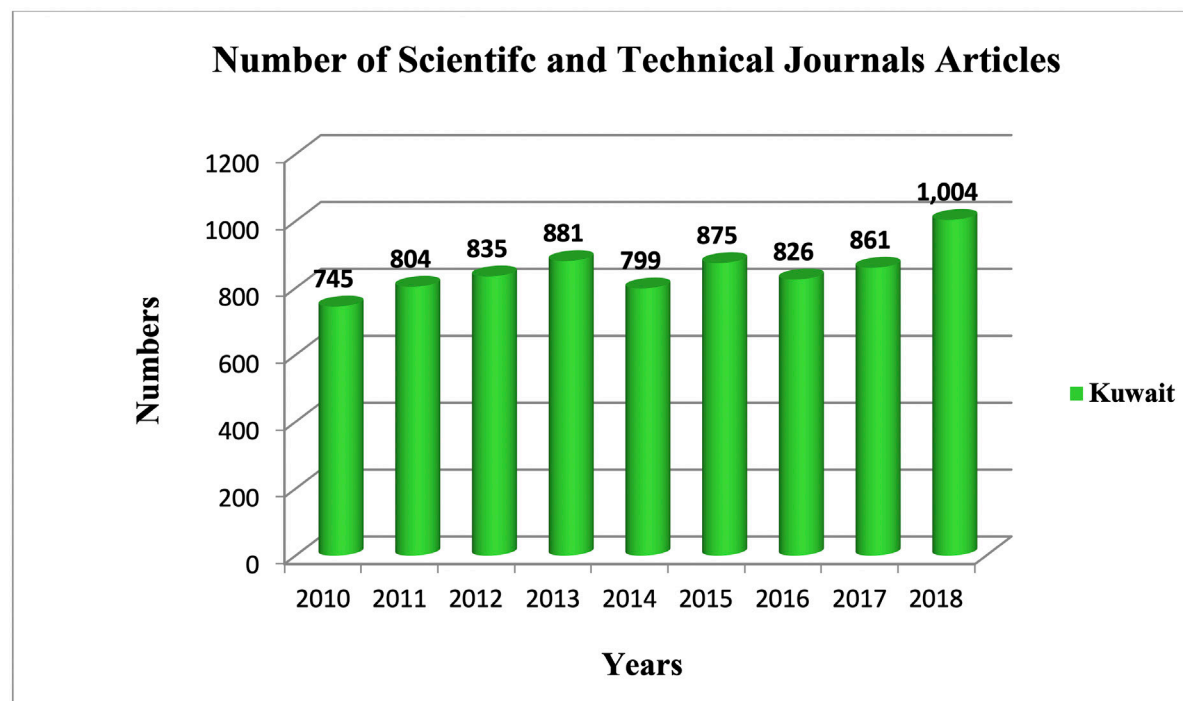


Figure 13. Kuwait Publications in years.



6.2 Patents (Intellectual property (IP)).

6.0 A long term scientometric analysis of scientific publications, patents, trademarks, and utility models.

6.1 Scientific Publications, Publication in High-impact journal & Number of citations/ Citation rate.

6.2 Patents (Intellectual property (IP)).

Patents in the Gulf Cooperation Council (GCC) for five years shows Kuwait as third highest in number after UAE and Saudi Arabia with 45 patents in 2019 (Table 8)⁴³.

Country	Year	Year	Year	Year	Year	Total Five-years
	2016	2017	2018	2019	2020	
Saudi Arabia	517	664	778	1,046	1,086	4,091
United Arab Emirates	65	93	85	116	129	488
Kuwait	48	45	33	45	27	198
Qatar	13	22	29	31	29	124
Oman	0	5	5	3	3	16
Bahrain	0	3	3	2	4	12

Table 8. Patents in the Gulf Cooperation Council in Five-years (2016-2020).



7.0 Historical analysis of SETI policies and institutions.

7.1 Kuwait economic activities, general characteristics.

7.2 Business environment ranking

7.3 Relationship with the Gulf Countries (GCC)

7.4 History of Human Development Index (HDI) analyses countries' social development based on three variables: life expectancy, education and living standards.

7.0 Historical analysis of SETI policies and institutions.

7.1 Kuwait economic activities, general characteristics.

Kuwait is a rich country and has developed a welfare state for its nationals, who enjoy a very high per capita income. After a slight recovery in 2018, Kuwait's economic growth slowed to 0.4% in 2019 as lower oil output and weaker oil prices offset the steady expansion of the non-oil sector. Due to the COVID-19 pandemic, it plummeted to -8.1% in 2020 but was expected to come back to 0.7% in 2021 and 3.2% in 2022, subject to the post-pandemic global economic recovery (IMF, April 2021). Government spending, employment and credit growth are expected to support economic activity in the short term; nonetheless, this will depend on stable oil prices and higher oil output.

With 102 billion barrels of oil in reserve (i.e. 6% of the world's total and representing 100 years of production), the country's industry is based on oil exploitation. This sector represents 40% of the GDP and more than 92% of the country's exports (OPEC, 2021). By 2030, Kuwait is planning to invest more than USD 87 billion in the oil sector, especially in creating new oil refineries. Overall, the industrial sector contributed more than half of GDP (57.5%) and employed 24% of the total workforce in 2020 (world Bank).

The services sector represented around 54.2% of the GDP and employed 74% of the active population in 2020 (world Bank). The most important sub-sectors are mostly real estate and financial services, which were recently recovered from the global financial crisis.



Shaikh Ahmad Al-Jaber Al-Sabah Spinned the Sliver Wheel as launched exporting Kuwaiti Crude Oil on 30/6/1946



Oil exploration in Kuwait

7.2 Business environment ranking.

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7.4 History of Human Development Index (HDI) analyses countries' social development based on three variables: life expectancy, education and living standards.

The business rankings model measures the quality or attractiveness of the business environment in the 82 countries covered by The Economist Intelligence Unit's Country Forecast reports. It examines ten separate criteria or categories, covering the political environment, the macroeconomic environment, market opportunities, policy towards free enterprise and competition, policy towards foreign investment, foreign trade and exchange controls, taxes, financing, the labor market and infrastructure⁴⁴.

Score: 6.38/10

World Rank: 47/8



Al-Shaheed Park

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7.2 Business environment ranking

7.3 Relationship with the Gulf Countries (GCC)

7.4 History of Human Development Index (HDI) analyses countries' social development based on three variables: life expectancy, education and living standards.

7.3 Relationship with the Gulf Countries (GCC).

Since its independence in 1961, Kuwait has maintained strong international relations with most countries, especially nations within the Arab world. Its vast oil reserves give it a prominent voice in global economic forums and organizations like the Organization of the Petroleum Exporting Countries (OPEC)^{45,46}. Kuwait is also a major ally of the Association of Southeast Asian Nations (ASEAN), a regional ally of China, and a major non- North Atlantic Treaty Organization (NATO) ally.

Regionally, Kuwait has a unique foreign policy that is characterized by neutrality. Kuwait's relationship with neighboring Iraq formed the core of its foreign policy from late 1980s onwards.

In 25 May 1981, the leaders of the Kingdom of Saudi Arabia, Sultanate of Oman, United Arab Emirates, State of Kuwait, State of Qatar and the Kingdom of Bahrain reached in a meeting held in the Emirate of Abu Dhabi, a corporative formula that includes the six countries aiming to achieve coordination, integration and interdependence between their countries in all fields in order to reach their unity according to what was stipulated in the basic law of the Gulf Cooperation Council (GCC) in its fourth article, which also emphasized strengthening ties, links and aspects of corporation between the citizens of the GCC countries.

The GCC Goals are as follows:

- Achieving cooperation and integration among the GCC states in all fields, in order to reach their unity.
- Strengthening ties between peoples.
- Establishing similar regulations in various economic, financial, commercial and customs fields as well as in various other economic activities.
- Promote the process of scientific and technical progress in the various fields of economics by establishing scientific research centers.
- Establishing joint projects and encouraging private sector cooperation

The GCC Secretariat, located in Riyadh City in the Kingdom Saudi Arabia, Conducted a Webinar symposium on 8th April 2021 on Status and Future Perspective of Scientific Research in the GCC Countries. The symposium presented the current situation of R&D and challenges in the GCC Countries. The symposium showed that the GCC countries face many challenges in research in quality of research, financing, administrative, political, and publications. In addition, the symposium outlined challenges that face researchers in the GCC countries at academic and research institutions, employment, and support. Partnership, knowledge economy challenges were also highlighted. The future perspective and R&D vision in the GCC Countries shows a need to support R&D in terms of financial, networking, partnership, innovation, and technology. The symposium also recommended the establishment of a support platform for R&D in the GCC, which calls for the development of a regional strategic plan for Science Innovation and Technology (STI)⁴⁷.



7.4 History of Human Development Index (HDI) analyses countries' social development based on three variables: life expectancy, education and living standards.

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7.2 Business environment ranking

7.3 Relationship with the Gulf Countries (GCC)

7.4 History of Human Development Index (HDI) analyses countries' social development based on three variables: life expectancy, education and living standards.

The Human Development Index (HDI) is a statistic composite index of life expectancy, education (mean years of schooling completed and expected years of schooling upon entering the education system), and per capita income indicators, which are used to rank countries into four tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the gross national income GNI (PPP) per capita is higher.

The Human Development Report 2020 by the United Nations Development Programme (UNDP) calculates HDI values based on data collected in 2019. The list comprises high-level HDI in GCC countries. Kuwait's HDI score shown a decrease in five years from 2014-2019 scoring 0.806 in 2019 (Table 9). Based on the HDI, in 2018, six Arab countries (United Arab Emirates, Saudi Arabia, Bahrain, Qatar, Oman and Kuwait) were at a very high human development level and another seven (Algeria, Lebanon, Tunisia, Jordan, Libya, Palestine and Egypt at high human development level. The rest of the Arab countries Morocco, Iraq, the Syrian Arab Republic and Comoros at Medium, and Mauritania, Djibouti, Sudan, and Yemen at a low human development level^{48,49,50}.

Rank		Country or Territory	HDI	
2019 data (2020 report)	Change over 5 years (2014)		2019 data (2020 report)	Average annual HDI growth (2019-2010)
31	▲(6)	United Arab Emirates	0.890	%0.91
40	▼(4)	Saudi Arabia	854	%0.60
42	▲(6)	Bahrain	0.852	%0.70
45	—	Qatar	0.848	%0.19
60	▼(3)	Oman	0.813	%0.43
64	▼(5)	Kuwait	0.806	%0.25

Table 9. Human Development Index growth trend

UNDP report 2020: Very high (0.800 and above), High score levels (0.700 – 0.799), Medium Score Levels (0.550-0.699) and low score levels (below 0.550).

▲ = increase.

— = steady.

▼ = decrease.

8.0 A standard content analysis of the explicit SETI policies, including those research and innovation policies implemented in other sectors, such as the agricultural, energy, health, industrial and mining sectors.

8.1 Analysis of Energy & Building Sectors

8.0 A standard content analysis of the explicit SETI policies, including those research and innovation policies implemented in other sectors, such as the agricultural, energy, health, industrial and mining sectors.

8.1 Analysis of Energy & Building Sectors

8.2 Analysis of SETI Policies in Health and Wellness.

8.3 Analysis of Water Resources

8.4 Analysis of SETI Policies in Petroleum (KPC and subsidiaries).

8.5 Analysis of SETI Policies in Environment.

8.6 Analysis of SETI policies in Industry.

There are urgent and legitimate motivations that call for the adoption of sustainable energy and resilient infrastructure strategies in Kuwait. This is recognized in the Kuwait National Development Plan (KNDP) for 2020–2025, where it emphasizes a commitment to secure a diverse energy supply, efficient energy consumption, reduction of greenhouse gas production, sustained construction and protective materials, and robust quality infrastructure.

The energy system in the country is facing the challenge of a rapid growth of domestic energy demands through the electricity, water desalination and industrial sectors. Currently, the domestic demand comprises about 12% of the locally produced oil at 2.8 million barrels/day. This is in addition to growing quantities of imported gas, which are also dedicated for local consumption. Under such a scenario and with the same oil production rate, the domestic demand would likely rise to nearly 20% of the total oil production by 2030. This high growth in demand is claiming more of the total hydrocarbon resource, and consequently, reducing the revenues from oil and oil products and impacting the environment. A sustainable energy strategy has become mandatory rather than optional for Kuwait's energy security.

In addition to the energy sector concerns, the building and infrastructure in the country has been dealing with growing challenges that involve the scarcity and shortage of indigenous building materials, durability/ longevity of infrastructure, and the effect of developing natural risks (climate change and seismic activities) on the building and infrastructure sector. Therefore, addressing the building and infrastructure challenges is crucial to the country's economic, social, and political prosperity and well-being.

The STI policy in the energy and building sectors is focused on the development and deployment of alternative energy options in Kuwait, implementation of energy efficiency and energy savings technologies in buildings and other applications, and development of new building materials, including reclamation and reuse of waste materials in construction.

8.2 Analysis of SETI Policies in Health and Wellness.

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8.6 Analysis of SETI policies in Industry.

Food Security Research advances the health of the Kuwaiti population and the safety and reliability of food resources through practical solution areas as follows: precision agriculture, sustainable animal production, improved food safety, reduced food waste, healthy diets and lifestyle, and biotechnology. Projects include development of new technologies and best management practices and technology transfer/dissemination of developed technologies/techniques to the local food production sector. Food safety work includes development of an early warning system to assess potential food contaminant risks from importing countries, development of tools for a more thorough streamlined process for inspecting imported food for contaminants, and a set of procedures for authenticating the halal status of imported foods.



Jaber Al-Ahmed Hospital

8.3 Analysis of Water Resources.

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8.1 Analysis of Energy & Building Sectors

8.2 Analysis of SETI Policies in Health and Wellness.

8.3 Analysis of Water Resources

8.4 Analysis of SETI Policies in Petroleum (KPC and subsidiaries).

8.5 Analysis of SETI Policies in Environment.

8.6 Analysis of SETI policies in Industry.

The geographical location of Kuwait is of great economic and environmental contrast. Kuwait is one of the world's richest oil producers, has long stretches of seashores, and is one among the hottest regions on earth. Aquifer waters are very limited and are non-replenishable. Annual rainfall is scarce and mostly sporadic.

Abundant hydrocarbon energy and seawater resources have made seawater desalination a viable alternative resource. Desalination has successfully secured the water needed for the vast urbanization and the immense socioeconomic growth of the country during the past 60 years. This is not likely to change in the future, as no other reliable and viable alternative source of freshwater has as yet, been foreseen.

Water desalination plants in Kuwait are combined with power generation plants and use fossil fuel for their operation. The economic burden of these operations is tremendous, and the environmental impact is severe. These operations are the major contributors to CO2 emissions in the country; 40 million tons in 2015. Given the expected increase in desalination plants by 2035, the economic burden and CO2 emissions can easily increase by 50–60%. This has raised serious concerns relative to the future sustainability of water supply in Kuwait; especially so, that its economy is directly connected and dependent on volatile oil prices and on the status of the climate change impact.

Presently, Kuwait produces about one million cubic meters of treated wastewater from its four main wastewater treatment plants daily, with only 65%, reused mainly for irrigation. Evidently, the goal is to treat and reuse all generated wastewater; but this can only be achieved by adopting more efficient and sustainable technologies. Therefore, the STI policy in Water resources is aiming at developing innovative hybrid treatment and reuse technologies for both municipal and industrial wastewaters that would suit Kuwait conditions, by 2030.



8.4 Analysis of SETI Policies in Petroleum (KPC and subsidiaries).

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8.1 Analysis of Energy & Building Sectors

8.2 Analysis of SETI Policies in Health and Wellness.

8.3 Analysis of Water Resources

8.4 Analysis of SETI Policies in Petroleum (KPC and subsidiaries).

8.5 Analysis of SETI Policies in Environment.

8.6 Analysis of SETI policies in Industry.

Undoubtedly, the petroleum sector is undergoing unprecedented stress and change. Competition from other gas and petroleum producers, growth in alternative energy, greater efficiency in vehicles, and the reality of global climate change, altogether conjoin to lower global oil prices. For Kuwait, this has created budgetary pressures and uncertainty to the future of the country's economy. Research and the development of new technology, however, hold the potential for positive change within the sector—change that can maintain the value of Kuwait's hydrocarbon assets, while responding creatively to the environmental challenges posed by the sector.

KPC is involved with several activities promoting the SETI ecosystem for the upstream and downstream. For the upstream oil sector, Kuwait Oil Company (KOC) has a mature technology management function responsible to scout, pilot and implement key and emerging technologies for the KOC assets. KOC also is responsible to conduct the research and to develop new solutions for the challenges facing the Kuwait upstream. Currently, this research is conducted in collaboration with leading local and international R&D organizations. However, KPC has tasked KOC to build KIPRC to also conduct in-house R&D on the challenges facing the upstream.

Key SETI activities at KOC include:

1. Kuwait International Petroleum Research Center:

KOC is working to establish the Kuwait International Petroleum Research Center (KIPRC) for the upstream. The Center will cater for 21 research and technology management (R&D/TM) programs under 7 platforms. The Center will not only kick-start the in-house R&D for the upstream but will also bring together all the other elements of the R&D/TM ecosystem including Collaboration, Technology Management and Capability Development.

2. Research and Technology Management through Collaboration:

Currently, the delivery of R&D/TM activities in KOC is relying on the engagement of identified local and external collaborators through Master Research Agreements (MRA). KOC has identified a total of 11 external universities and research centers, 9 service companies, and local universities and institutes including Kuwait University, Kuwait Institute for Scientific Research (KISR), and PAAET as its strategic partners.

3. Post Graduate Program:

There is an essential need to satisfy KIPRC manpower requirements with high level research professionals (i.e., PhD/MSc Degrees across various disciplines by). KOC has worked on identifying proper paths to secure these high-level employees. Several initiatives are currently ongoing, like: (1) Establishing with Kuwait University PhD Programs under Petroleum Eng., Chemical Eng. and Geology, and (2) Utilizing Public Authority for Applied Education (PAAET) Lab Technician Diploma Program to help in operating KIPRC Labs.



مؤسسة البترول الكويتية
Kuwait Petroleum Corporation

8.5 Analysis of SETI Policies in Environment.

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8.5 Analysis of SETI Policies in Environment.

8.6 Analysis of SETI policies in Industry.

Environment and Healthcare are two central pillars of the National Development Plan. Seeking solutions to Kuwait's pressing environmental and health issues is the core of what we do in our Environmental and Life Sciences Research Center. Rapid urbanization, exploitation of Kuwait's vast hydrocarbon resources, industrial and agricultural practices of neighbouring countries, and the effects of global climate change are causing enormous stresses on Kuwait's fragile environment and are affecting the ecosystem's sustainability and quality of life. Similarly, sedentary lifestyles, poorly managed dietary intakes, and emerging and legacy pollutants contribute to significant health issues in the population. Added to these is the issue of food security where Kuwait imports most of its agricultural commodities, while the country strives to make sustained efforts in improving local production.



Al-Nuwair Flowers in Kuwait Desert

8.6 Analysis of SETI policies in Industry.

8.0 A standard content analysis of the explicit SETI policies, including those research and innovation policies implemented in other sectors, such as the agricultural, energy, health, industrial and mining sectors.

8.1 Analysis of Energy & Building Sectors

8.2 Analysis of SETI Policies in Health and Wellness.

8.3 Analysis of Water Resources

8.4 Analysis of SETI Policies in Petroleum (KPC and subsidiaries).

8.5 Analysis of SETI Policies in Environment.

8.6 Analysis of SETI policies in Industry.

The policy issues facing Kuwait's economy today are diverse and challenging. They include the need for a viable diversification strategy to expand the private sector and create meaningful employment opportunities for nationals. Accordingly, scope of the private sector and its production processes must be widened and updated, micro small- and medium-sized enterprise (MSMEs) to be encouraged, non-oil high value-added activities to be stimulated. Moreover, the national workforce should be trained to match the skill set required in the reinvigorated private sector and entrepreneurship and innovation should be stimulated. Additionally, economic diversification requires enhancing economic efficiency, ensuring productivity gains through global competitiveness and removing price distortions and other supportive fiscal policies.

Achieving these enabling states requires well-informed and grounded policies, ability to model likely policy outcomes, and ability to measure and assess impacts of interventions and investments. KISR's Techno-Economics Division (TED) has some of the best capabilities and experience in Kuwait to meet these requirements. With expertise in macro- and micro- economic analysis, sophisticated economic modelling capabilities, knowledge of the Kuwaiti economy and policy environment, KISR's economists have an extended history of supporting Kuwait policy makers in making sound policy decisions. This support includes feasibility studies and economic modelling. Additionally, TED's research staff provides advice on business planning and financial analysis to firms and individuals in the private sector.



Mina Abdullah Refinery - KNPC

9.0 A description of the SETI policy cycle.

In general, public/national policy life cycle as shown in (Figure 14), including for SETI, consists of the following stages: (i) agenda-setting, (ii) formulation, (iii) decision making, (iv) implementation and (v) evaluation. In each stage, government entities and non-government organizations are in charge. This framework is adopted by the Government of Kuwait under the leadership of the General Secretariat of the Supreme Council for Planning and Development.

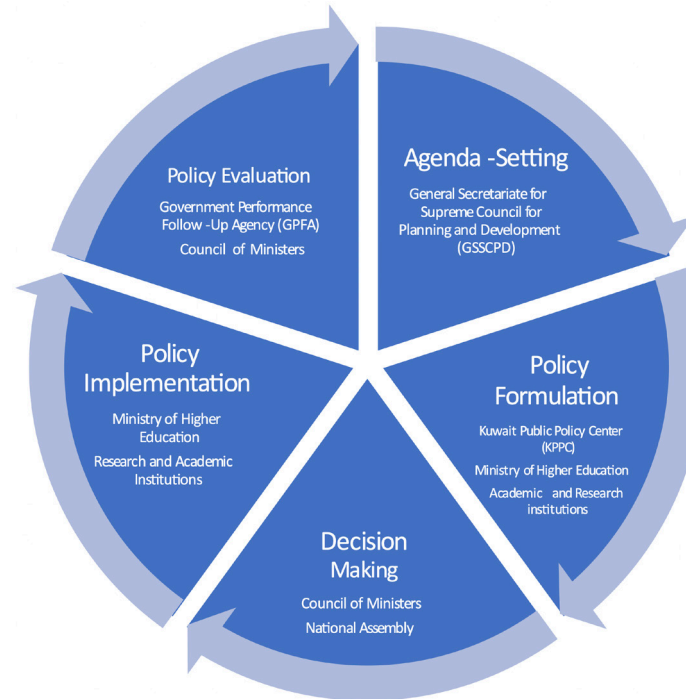


Figure 14. SETI Policy Cycle for the State of Kuwait.

National Development Plan Agenda-Setting:

National policies are set according to the Development Planning Law 7/2016 by the Supreme Council for Planning and Development and its General Secretariat. These policies are compiled in a Mid-Range five years plans known as, Kuwait National Development Plan (KNDP) which is ratified by the National Assembly and issued by law. The issuance of the law plays as enforcement of the public policies at the national level. KNDP acts as a roadmap to achieving Kuwait National Vision 2035, known as New Kuwait, that is aligned with the United Nation Sustainable Development Goals Agenda 2030. The Kuwait Public Policy Center (KPPC) at the GSSCPD plays an instrumental role in developing evidence-based policies in the KNDP. The KPPC supports GSSCPD in achieving a policy focused national development plan with streamlined policies on health, economic diversification, public administration, education and labor market, and energy and environment; through a participatory approach by engaging all parties including citizens, private sector, and civil society organizations (CSOs) in the policymaking process. First, based on thorough analysis of existing challenges and gaps, second a research agenda with priority areas for each pillar is developed. Third,

9.0 A description of the SETI policy cycle

9.0 A description of the SETI policy cycle.

the center collaborates with different local and international partners to implement the research agenda. Fourth, a white policy paper for each policy area in the KNDP sets the strategic roadmap for the sector and presents the different policy options. Fifth, the policy recommendations are consolidated through roundtable discussions with relevant stakeholders. Finally, the policies are presented in the KNDP 5-year plan to the SCPD members and council of ministers.

Policy Formulation:

Based on the strategic direction set in the KNDP 5-year plan, specifically related to the Human Capital pillar, the SETI policy formulation adopts a consultative process led by the Ministry of Higher Education and coordinated by the GSSCPD/ KPPC. Owing to the cross-cutting nature of research, innovation and scientific and technical services, other line ministries contribute to the formulation of the national SETI policy, such as the Ministry of Health, Public Authority for Agriculture and Fish Resources, Ministry of Electricity and Water, ministry of Oil and others. There were some attempts by Kuwait Institute for Scientific Research to establish the National Science, Technology, and Innovation Commission in 2018.

Decision Making:

The policies are usually reviewed at different levels before adoption. The office of the Council of Ministers/ under which the Economic Committee functions, is usually responsible for the overall decision-making process. If an act or a law is to be issued it is usually addressed to the Parliament for final approval.

Policy Implementation:

Implementation of SETI is covered by research and academic institutions under different units. All activities, however, are subject to financial support and approval from the Ministry of Finance (MOF) on annual basis. Government annual budget approval of each institution is addressed to the Parliament for approval and endorsement.

Policy Evaluation: Evaluation of SETI achievement based on the performance of implementation institutions is usually performed by the Government Performance Follow-up Agency (GPFA), Council of Ministers. The Agency practices its role in following up the performance of government agencies in accordance with the terms of reference and regulations as stipulated in its establishment decree No. 346 of 2007. GPFA coordinates and cooperates with the ministers in following-up the workflow of their ministries and affiliated governmental bodies including SETI institutions, the implementation of the laws and regulations and their commitment to the State general policy according to the government action plan. The Agency reports annually to the decision makers to solve any issues relating to the governmental performance.



10.0 A complete analysis of the SETI organizational chart at five different levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level).

10.0 A complete analysis of the SETI organizational chart at five different levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level).

The SETI organizational chart for the State of Kuwait is presented in (Figure 15), showing the different levels of making, promoting, executing, services level and evaluation of SETI policy. The Government branches are: The Ruler of the State of Kuwait (Executive), Judicial (Constitutional Court) and Legislative (parliament).

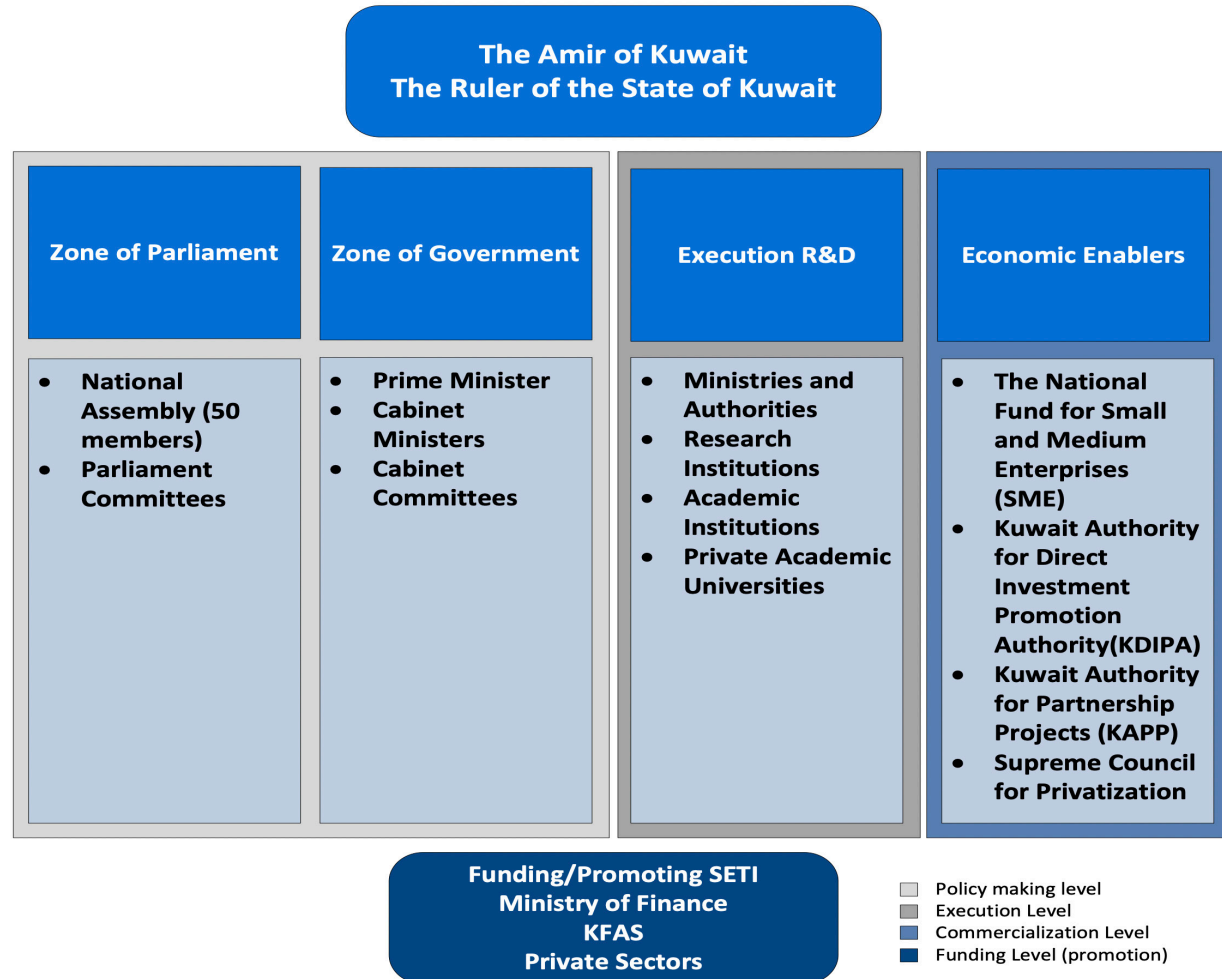


Figure 15. A simplified Structure of the SETI Organization in Kuwait levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level).



10.0 A complete analysis of the SETI organizational chart at five different levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level).

10.0 A complete analysis of the SETI organizational chart at five different levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level).

The Ruler of the State of Kuwait

The Amir of Kuwait is the Ruler of the State of Kuwait and appoints Kuwait's prime minister. The Amir is chosen from within the ruling family and is confirmed by parliamentary vote. The Amir then appoints the prime minister and deputy prime ministers. The Amir can dissolve parliament. The prime minister oversees executing executive tasks for the Amir.

The Parliament

A 50-member National Assembly (parliament) is elected in polls held every four years. Both men and women can stand for election, and all Kuwaitis over the age of 21 are eligible to vote, apart from members of the military. The national assembly oversees creating legislature, approving/disapproving the Amir's appointments, and removing the Amir from post.

The Cabinet

Executive power in Kuwait is vested in the Cabinet or the Council of Ministers. It is headed by the Prime Minister. The Prime Minister is appointed through an Amiri Decree. The Cabinet controls the state institutions. It is responsible for the general policy of the government and its execution. Each minister in the Cabinet holds one or more portfolios. The Prime Minister and his ministers are accountable to the Amir and the National Assembly.

Besides executive powers, the Constitution grants the Cabinet authority to declare defensive war, proclaim martial law, and promulgate law decrees when the National Assembly is not in session or its legislative term has expired, grant pardons, and issue executive and administrative regulations.

Judicial

The Constitutional court can dissolve the national assembly and oversees of interpreting the constitution. It is appointed by the Amir upon recommendation of the supreme judicial council. It continues until dismissal by the executive branch.

The Ministers

The ministers of the Cabinet are appointed by the Amir on the recommendation of the Prime Minister. According to the Kuwaiti constitution, the number of ministers in a Cabinet must not exceed one-third the strength of the National Assembly. This number does not include the Head of the National Guard, the Amiri Diwan Affairs Minister, the Amir's Advisor, and the Chairman of the Audit Bureau. The Minister of Oil and Minister Higher Education is overseeing the SETI system both in the oil sector and higher education. Which are executed by the following institutions/organizations: Kuwait Petroleum Cooperate (mainly Kuwait Oil Company (KOC)), Kuwait Institute for Scientific Research and Kuwait University. The Minister of Education oversees the Education system and its execution. In respect to SETI, the Public Authority for Applied Education & Training. Other governmental and non-governmental organization who execute SETI are less involved and will not be addressed in this report (e.g., the Ministry of Electricity & Water (MEW), Kuwait Environment Public Authority (KEPA), Public Authority for Agriculture and Fish Resources (PAAFR)

10.0 A complete analysis of the SETI organizational chart at five different levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level).

10.0 A complete analysis of the SETI organizational chart at five different levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level).

The Economic Enablers

The economic enablers (Figure 16) in relation to SETI include Small and Medium Enterprise (SME), Kuwait Authority for Direct Investment Promotion Authority (KDIPA), and Kuwait Authority for Partnership Projects (KAPP). Promoting agents include Kuwait Foundation for the Advancement of Sciences (KFAS) and Ministry of Finance.



Figure 16. The Economic Enablers of Kuwait Economy, Kuwait Vision 2035.

11.0 An inventory of all the SETI government bodies and organizations related both to research and innovation and to science and technology services.

11.1 Kuwait Foundation for Advancement of Sciences (KFAS).

11.0 An inventory of all the SETI government bodies and organizations related both to research and innovation and to science and technology services.

11.1 Kuwait Foundation for Advancement of Sciences (KFAS)

11.2 Kuwait Petroleum Cooperation (KPC)

11.3 The Public Authority for Applied Education and Training (PAAET)

11.4 The Public Authority for Industry (PAI)

11.5 Kuwait Institute for Scientific Research (KISR)

11.6 Kuwait University (KU)

Kuwait Foundation for Advancement of Sciences (KFAS), a private non-profit organization was established in 1976 by an Amiri Decree under the direction of the late Amir of Kuwait, HH Sheikh Jaber Al-Ahmad Al-Jaber Al-Sabah. His enduring vision has been to create and develop a thriving culture of science, technology, and innovation for a sustainable Kuwait. KFAS's charter represents the commitment by local shareholding companies to contribute 5 percent of their annual net profits to fund the foundation, which over the years has been reduced to 1 percent. Through its Research Directorate, KFAS supports the research in Kuwait, mainly through providing research grants (Figure 17), as well as establishing and funding KFAS research centers: DDI and JAC. KFAS also support capacity building and networking of researchers and research institutions, through international collaborations. Collaborative Research Unit, supporting international collaborations in research with renowned international research and academic institutions, as well as centers of excellence, such as with the University of California, Berkeley, or Paris' Sciences Po.

The Foundation supports the important role of the private sector in driving socioeconomic development and continued to motivate and develop the capabilities of the sector in the fields of STI, in line with KFAS's strategy (2017-2021), which focused on furthering the capabilities of the sector through STI. In 2018, KFAS continued to encourage innovation-stimulating activities in the private sector and presented capacity-building initiatives to support the competitiveness of its employees within the Kuwaiti market.

The KFAS's initiatives included programs that improved the competencies of the participants and enriched their skills and innovative capabilities, to enhance their work environments. To foster the development of thriving startups (small and medium-sized businesses), the Foundation supported young entrepreneurs by encouraging their innovative and creativity through STI.

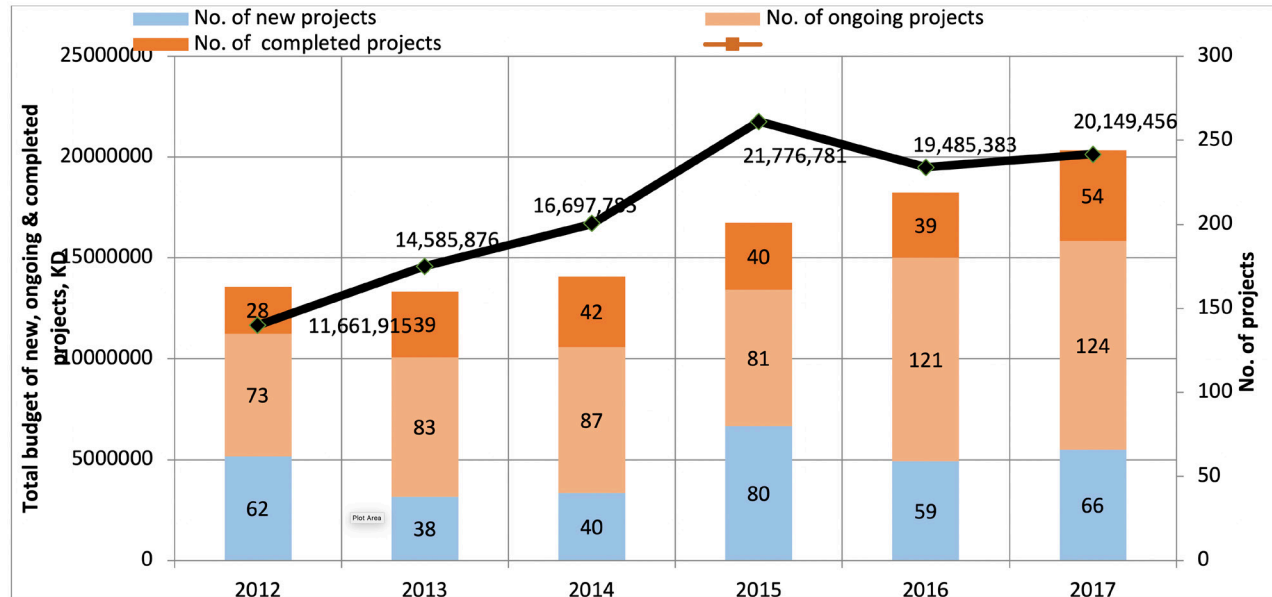


Figure 17. Total Number and Value of Grants for Ongoing Research Projects (Courtesy KFAS).

11.2 Kuwait Petroleum Cooperation (KPC).

11.0 An inventory of all the SETI government bodies and organizations related both to research and innovation and to science and technology services.

11.1 Kuwait Foundation for Advancement of Sciences (KFAS)

11.2 Kuwait Petroleum Cooperation (KPC)

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11.4 The Public Authority for Industry (PAI)

11.5 Kuwait Institute for Scientific Research (KISR)

11.6 Kuwait University (KU)

KPC⁵¹ was established in 1980 as a public corporation and is the major player in the Kuwaiti oil sector. In general, its objects are to engage in all activities relating to the petroleum industries and hydrocarbonic materials in all their stages, as well as all related industries, both within and outside Kuwait (Article 3, Law No. 6 of 1980). Included in the many activities in which KPC may engage in achieving its objects is the right to form partnerships with other companies or entities that engage in similar activities and that may assist KPC in realizing its objects (Article 5, Law No. 6 of 1980). Historically, KNPC, KOC and PIC were partially owned by the State in conjunction with private investors. KNPC was established by Decree in 1960, as a 60/40% partnership between the State and the private sector, respectively. Its objectives were to engage in the oil industry inside and outside Kuwait and to engage in any stage of oil production, including exploration of petroleum and natural gas, refining and transportation. PIC was established in 1963 between the State and local private investors as a commercial company for the purpose of establishing a petrochemical industry for Kuwait. Finally, in 1974, the State entered into a Participation Agreement with BP Limited and Gulf Kuwait, creating KOC. The current objects of this entity are the exploration, exploitation, refining and production of oil for the local market and for exporting purposes. Through a series of legislation in the mid-1970s aimed at nationalizing the oil sector, KNPC, KOC and PIC became fully owned by the State. Ultimately, by virtue of the 1980 law establishing KPC, all these companies were transferred to KPC.



11.3 The Public Authority for Applied Education and Training (PAAET) 11.3 The Public Authority for Applied Education and Training (PAAET).

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11.4 The Public Authority for Industry (PAI)

11.5 Kuwait Institute for Scientific Research (KISR)

11.6 Kuwait University (KU)

The establishment of applied education and training centers and institutes in Kuwait began in conjunction with the initiation of oil exploration, production, and export. Then the Ministry of Education established several specialized training centers to meet the increasing demand for skilled manpower by sectors other than oil industry. These centers were supervised by the Technical and Vocational Education Department, which was founded later in 1972. Similarly, other ministries established their own training centers and institutes. However, these training centers and institutes were then transferred to the Central Administration for Training, which was established in 1973 to supervise training centers and institutes affiliated with ministries other than the Ministry of Education. Later in 1976, the Central Administration for Training was attached to the Ministry of Social Affairs and Work. Finally, in 1982, PAAET was founded by Law No. (63) as an independent governmental body to provide and regulate applied education and training. Hence, the Technical and Vocational Education Department and the Central Administration for Training, and their associated training centers and institutes, were transferred to PAAET⁵².



11.4 The Public Authority for Industry (PAI).

11.0 An inventory of all the SETI government bodies and organizations related both to research and innovation and to science and technology services.

11.1 Kuwait Foundation for Advancement of Sciences (KFAS)

11.2 Kuwait Petroleum Cooperation (KPC)

11.3 The Public Authority for Applied Education and Training (PAAET)

11.4 The Public Authority for Industry (PAI)

11.5 Kuwait Institute for Scientific Research (KISR)

11.6 Kuwait University (KU)

On 15 January 1997, Public Authority for Industry⁵³ was established, and it is an autonomous authority under the supervision of the Minister of Commerce & Industry. The purpose of such an establishment was developing, promoting, and supervising the industrial activity in the State of Kuwait, through encouraging local industries, protecting and expanding the production base to including strategic goods required for national and nutritional security, and this would diversify national income sources which is a main goal for PAI. In addition to that it is in PAI's concern to deepening the industrial awareness of the citizens, and helps propagate studies, coordinate between the existing industries and that proposed for future at GCC and Arabian countries and consolidates the industrial cooperation with different countries and international organization.



The Public Authority of Industry aims to develop, promote, and supervise the industrial activity in the country as well as development of the industrial base for achievement of the national economy goals, including the following:

1. Encouraging, development and protection of the local industries.
2. Expansion the industrial and crafts production base.
3. Diversifying sources of national income.
4. Support, development and encouragement of the strategic goods production necessary for national and food security.
5. Creating the right and suitable climate to attract more national manpower with technical competence and efficiency.
6. Deepening, developing, and encouraging the industrial crafts.
7. Deepening the industrial awareness of the citizens and highlighting the positive role of the industrial development program as well as preparation and publishing the studies and research and providing information systems, industrial data and encouraging development and creativity.
8. Coordination between the existing and current industries and those proposed to be held in the future in the GCC States in particular and the Arab countries in general to achieving integration and avoidance of harmful competition.
9. Enhancement of the industrial cooperation with different countries and international organizations to provide the necessary experience, expertise and information for the local industrial development.
10. Increasing the Kuwaiti industrial exports share in the international markets and creating export industrial investment opportunities.

11.5 Kuwait Institute for Scientific Research (KISR).

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- 11.2 Kuwait Petroleum Cooperation (KPC)
- 11.3 The Public Authority for Applied Education and Training (PAAET)
- 11.4 The Public Authority for Industry (PAI)
- 11.5 Kuwait Institute for Scientific Research (KISR)**
- 11.6 Kuwait University (KU)

KISR⁵⁴ is a pioneering, independent, national institute of scientific excellence. It was established in 1967 by Japan's Arabian Oil Company Limited, in partial fulfillment of its obligations under an oil concession agreement with the government of the State of Kuwait. KISR's initial role was dedicated to developing three fields of national importance: petroleum, desert agriculture, and marine biology. Since then, KISR's role and responsibilities have expanded greatly to include the advancement of national industry and the undertaking of studies to address key challenges, such as the preservation of the environment, sustainable management of Kuwait's natural resources, responsible management of water and energy, and development of innovative methods of agriculture.

In 1981, KISR's status was further reviewed, and its role reconfirmed in the development of scientific research and technology in the country. In addition, the law broadened the mission and entrusted the institute with undertaking research and scientific and technological consultations for both the governmental and the private sectors in Kuwait, the Arabian Gulf region, and the Arab world, and encouraged collaboration with international institutes.

KISR's approach to meeting challenges is distinguished by a culture of openness, a commitment to our clients, and an integrated, cross-disciplinary approach. KISR routinely embarks on strategic partnerships with other regional and international institutes, agencies, and academic bodies, allowing an exchange of knowledge and expertise. In 2010 KISR established a strategic transformation to establish research centers of excellence. Today, KISR is home to over 580 researchers and engineers and over 100 laboratories, housed at 9 locations, with growth expected through the implementation of a new strategic plan (2020-2025). KISR conducts scientific research and performs technological consultations, often in partnership with other regional and international institutions, for governmental and industrial clients in Kuwait, the Gulf region, and the rest of the world. These partnerships, driven by a philosophy of collaboration that runs deep within KISR culture, help build up knowledge base, and facilitate the free flow of information, data, and expertise.



11.6 Kuwait University (KU).

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11.4 The Public Authority for Industry (PAI)

11.5 Kuwait Institute for Scientific Research (KISR)

11.6 Kuwait University (KU)

The establishment of Kuwait University⁵⁵ began by issuing an Amiri decree in 1966 No. 29/1966. It took the responsibility of preparing and educationally qualifying the young generation, the real wealth of this country, to achieve the ambitious future goals with the most necessary knowledge, culture, and science. The ability to offer distinguished academic learning for these young generations is the key to developing and disseminating the knowledge needed to meet all goals and meet the requirements of society.

Since its establishment, Kuwait University has witnessed a significant expansion in the number of scientific colleges reaching 16 colleges. The colleges offer various undergraduate and graduate programs. They are College of Law, College of Arts, College of Science College of Medicine, College of Engineering and Petroleum, College of Allied Health Science, College of Education, College of Sharia and Islamic Studies, College of Business Administration, College of Pharmacy, College of Dentistry, College of Social Science, College of Women, College of Architecture and College of Computer Science and Engineering. As for graduate programs, the university currently offers 6 Ph.D. programs, 48 Masters and 4 Higher Diploma programs in various disciplines. It is planned to offer new graduate studies programs to cover all the available bachelor's degree programs at Kuwait University.

Kuwait University is committed to preparing great human wealth armed with the knowledge to meet the requirements of the state of Kuwait's development and keep up with the pace of modern life through high-quality education, excellence in scientific research, and advancement of community service.



12.0 An inventory of the SETI legal framework, including acts, bills, regulations and international agreements on SETI issues.

12.1 Kuwait Constitution.

Kuwait's Constitution combines the positive aspects of both presidential and parliamentary forms of government. It is based on principles of democracy - on the sovereignty of the nation, freedom of the citizen and on equality of all citizens in the eyes of the law.

Kuwait's Constitution was drafted by an elected 20-member Constituent Assembly and 11 ministers - who joined the Assembly later. On November 1, 1962, the draft constitution was approved by the then Amir, late Sheikh Abdallah Al-Salem Al-Sabah. The Constitution came into force on January 29, 1963, when the first National Assembly convened.

The Kuwaiti Constitution, comprising 183 articles is an exhaustive document. It is divided into five parts:

- The state and the system of government
- Fundamental constituents of the Kuwaiti society
- Public rights and duties
- Powers
- General and transitional provisions

Several articles of the constitution are concerned with science and scientific research, including, for example, Article 14, which obligates the state to foster science and to encourage scientific research, and Article 36, which states that freedom of scientific research is guaranteed. On the other hand, Article 29 of the Constitution states that people are equal before the law in public rights and duties, with no discrimination between them on the grounds of gender, origin, language, or religion.

12.0 An inventory of the SETI legal framework, including acts, bills, regulations and international agreements on SETI issues.

12.1 Kuwait Constitution.

12.2 Kuwait University Law

12.3 Private Universities Law

12.4 Kuwait Institute for Scientific Research (KISR)
Amiri Decree 28/1981.

12.5 Anti-Corruption Law



Shaikh Abdullah Al-Salem Al-Sabah received the draft of Kuwaiti Constitution from the Chairman of the Constituent Assembly Mr.Abdullatif AlGhanim 11/11/1962



National Assembly

12.2 Kuwait University Law.

Kuwait University was established by virtue of Law (29/1966) which regulated higher education until the enactment of the Public Universities Law (Law No. 76) in 2019. Article (1) of the Law (29/1966) obligated Kuwait University to conduct and encourage scientific research to advance science and serve the society.



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12.3 Private Universities Law

12.4 Kuwait Institute for Scientific Research (KISR) Amiri Decree 28/1981.

12.5 Anti-Corruption Law

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12.4 Kuwait Institute for Scientific Research (KISR) Amiri Decree 28/1981.

12.5 Anti-Corruption Law

12.3 Private Universities Law.

Establishment of Private Universities Law (PUL 34/2000).

In accordance with the constitution, and in consideration of law no. 29 for 1966 regulating higher education and its amendments and law no. 63 at 1982 establishing the Public Authority for Applied Education and Training, we have ratified and promulgated this law passed by the National Assembly; the articles whereof are hereinafter detailed.

Article (1)

It is permissible by a decree issued in response to a request by the Minister of Higher Education to license the foundation of private universities/ colleges or higher institutes/branches of foreign universities where most shared capital funds are wholly owned by Kuwaitis.

Article (2)

A private university aims at contributing to the promotion of the goals of higher education and applied education; in a manner optimally meeting all envisaged society's developing needs and performing research services.

Article (3)

The decree founding a private university shall prescribe its legal status, regulating provisions and constituent colleges and higher institutes. It defines the mode for forming their boards of trustees, related functions, and financial resources. It also defines academic degrees offered and stipulated prerequisites.

Article (4)

A private university shall have an independent honorary character as of the date of promulgating its founding decree in the Official Gazette; and shall be represented by the university president before other parties and in courts of law. The university shall have the right.

12.4 Kuwait Institute for Scientific Research (KISR) Amiri Decree 1981/28.

12.0 An inventory of the SETI legal framework, including acts, bills, regulations and international agreements on SETI issues.

12.1 Kuwait Constitution.

12.2 Kuwait University Law

12.3 Private Universities Law

12.4 Kuwait Institute for Scientific Research (KISR) Amiri Decree 28/1981.

12.5 Anti-Corruption Law

The Amiri Decree Law No. 28 of 1981 on Kuwait Institute for Scientific Research is shown in (translation).

Article (1)

Kuwait Institute for Scientific Research shall be a public organization with a legal and independent personality that falls under the supervision of a Minister to be selected by the Council.

Article (2)

The institute shall have an objective to advance the scientific and applied research, particularly such that pertain to the industry, energy, natural wealth resources, food resources and all other key components of the national economy to serve the goals of economic technological and scientific development of the State, and to provide advice to the Government in scientific domains, including the scientific research policy of the country.





12.5 Anti-Corruption Law.

12.0 An inventory of the SETI legal framework, including acts, bills, regulations and international agreements on SETI issues.

12.1 Kuwait Constitution.

12.2 Kuwait University Law

12.3 Private Universities Law

12.4 Kuwait Institute for Scientific Research (KISR) Amiri Decree 28/1981.

12.5 Anti-Corruption Law

The Kuwaiti judicial system is well-developed and aligns with international commercial laws. The Kuwait Anti-Corruption Authority (Nazaha) was established by Law No. 2 of 2016 Article (4).

The authority aims at achieving the following:

1. Establishing the principle of transparency and integrity in the economic and administrative transactions to ensure the achievement of the rational management and optimal utilization of the State's funds, resources, and properties.
2. Implementing the United Nations Convention against Corruption approved by the Law No. (47) of 2006 and any anti-corruption international conventions and treaties to be approved.
3. Seeking to combat corruption, prevent its dangers and impacts, prosecute its perpetrators, confiscate, and recover funds and proceeds resulted from the practice thereof, in accordance with the law.
4. Protecting the State's agencies from bribery, exploitation, and abuse of power to achieve personal benefits and prevention of mediation and nepotism.
5. Protecting the whistle-blowers of corruption.
6. Promoting the principle of cooperation and participation with the States and the regional and international organizations in the fields of anti-corruption.
7. Promoting and activating the role of the civil society institutions and organizations in combating corruption, educating members of the society of its dangers, and raising awareness of means and methods of corruption prevention.

All efforts are exerted to improve Kuwait Corruption Index as per anti-corruption strategy (2019-2024). The strategy specifies goals about integrity and combating corruption in Kuwait through deliberate priorities and initiatives, enhancement of transparency, establishment of law and order, promotion of the sense of nationalism, creation of more trust in the governmental efforts, participation in the provision of a better environment for business, attraction of investments and promotion of economic competitiveness. The success of this endeavour will lead to the upgrading of the classification of Kuwait in the relevant international indexes (Kuwait Corruption Index is 40 (2019), New Zealand scored world highest (87)), including corruption perception index and to realization of Kuwait Vision 2035.

The Corruption Perception Index⁵⁶ (CPI) ranks countries in terms of the degree to which corruption is perceived to exist in the misuse of public power for private benefit (Figure 18)⁵⁷,



12.5 Anti-Corruption Law.

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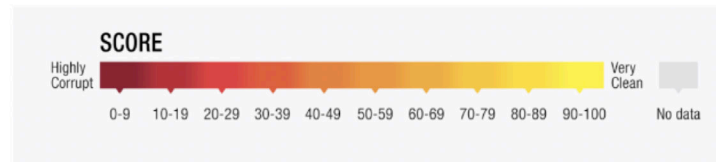
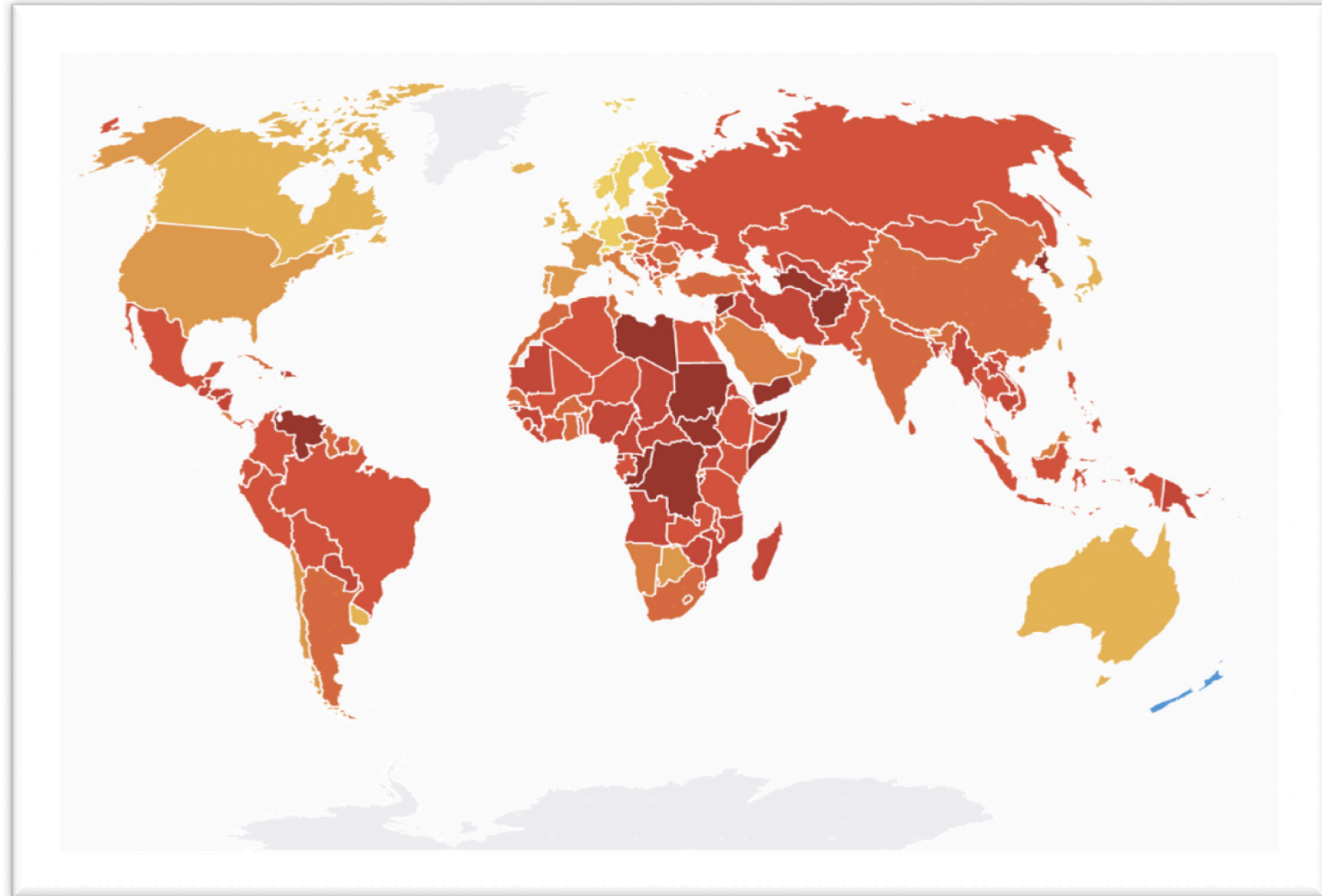


Figure 18. Corruption world map (2020). Kuwait is within the range (40-49).

13.0 A SWOT analysis of the country's research and innovation landscape

13.0 A SWOT analysis of the country's research and innovation landscape

One of the fundamental challenges, weaknesses and threats (Table 10) that face the research and innovation landscape in Kuwait is the absence of a national innovation and technology policy body to formulate and co-ordinate innovation policy in Kuwait, knowing very well that innovation governance at the national level has a significant impact on national innovation performance.

Strength (S)	Weakness (W)
<ul style="list-style-type: none"> • Vision 2035 inclusive of STI & SDG goals • Oil, Capital surplus economy • One of the largest sovereign wealth funds (SWF) in world • Generous SMEs fund (\$7 billion) • Political stability • Young population • Educated human resources. • Open/liberal trade laws/system • Supportive business infrastructure • Open private sector • Good legal system • Established/stable institutions. • Regionally strong patenting activity • Many organizations and industries are capable of funding R& D activities. • High international collaboration and ease of funding joint R& D activities. • Government has and can procure advance technologies. • Excellent relations of advance technological countries 	<ul style="list-style-type: none"> • Absence of properly defined and integrated R&D policies and national innovation strategy, STI governing, policy making body and implementation. • Exceptionally low rate of R&D personnel • Low to moderate scientific output & patenting • Weak linkages between innovation, R&D, academia, and business/ industry • Limited industrial, non-oil productive sector – import dependent mostly. • Nonexistence of a mechanism for allocating funds for R&D activities • Lack of procedures and methods for assessing, evaluation and implementing R&D findings and recommendations. • Minimal contribution of the private sector in R&D activities. • R&D is not demand driven, hence the existence of mismatch between R&D supply and demand. • Lack of marketing of R&D activities.
Opportunities (O)	Threats (T)
<ul style="list-style-type: none"> • Increase funds and augment good management of funds to appropriate to successful STI policy, development, implementation, and penetration. • Provision of equity financing schemes • STI National players are active: SACGC, NTEC, KISR, KU, National Fund, & others • Vision 2035 focuses on STI, national SME Fund. • Small population – innovation and High-Tech ready • Need to reduce barriers to innovation. • Easy and early acquisition of new/cutting edge technology. • Initiative to improve and strengthen the education system and STEM scores – the long-term foundation for strong STI inputs. 	<ul style="list-style-type: none"> • Fluctuating income subject to Oil Price • Policy challenge/ policy inertia • Kuwaitization policy • Unskilled/labor - overwhelming • Budget - low R&D expenditure • Regional neighbors have become more competitive/advanced in STI • Research in universities is purely academic. • Non proper linkages between industries and R&D institutions. • No link between education curriculum and R&D • No incentive for recruiting top scientists.

Table 10. SWOT Analysis for R&D in Kuwait



13.0 A SWOT analysis of the country's research and innovation landscape

13.0 A SWOT analysis of the country's research and innovation landscape

Kuwait enjoys many strengths toward developing a strong and sustainable STI landscape. The country has a clear and well supported vision, as pronounced by the Vision 2035 and it has the budgetary funds to achieve it due to its oil and capital surplus long standing advantages. Kuwait enjoys a long-standing democratic process whereby legislative decisions are made and permeate society with great acceptance and communal support, within national framework that hosts strong, stable institutions and a legacy of a Kuwait that strives to always develop and help others do so, adopting an inclusive approach. Kuwait's population are mostly under the age of 25, the population is considered overwhelmingly educated, with extremely low illiteracy rates and technology friendly. This is in addition to a robust private sector that is open to liberal trade going back to over a century. Kuwait enjoys excellent trade and science diplomacy relations enabling it to collaborate with many advanced STI partners that Kuwait consistently takes stock of.

One of the fundamental challenges, weaknesses and threats that face the research and innovation landscape in Kuwait is the absence of a national innovation and technology policy body to formulate and co-ordinate innovation policy in Kuwait, knowing very well that innovation governance at the national level has a significant impact on national innovation performance. This gap has created many challenges that include:

- Kuwait lacks an integrated innovation strategy with implementation institutional process.
- Lack of effective innovation policy development, coordination and implementation across government prevents progress on innovation and diversification targets.
- Lack of effective innovation policy development and coordination prevents progress on innovation and economic diversification targets and lacks the implementation at the institutional level.
- Kuwait lacks an integrated innovation strategy.
- Poor linkages between business/industry and R&D and academia
- Inefficiencies and duplicity is overwhelming due to unorchestrated efforts, raising costs and diluting efforts.
- Kuwait ability to attract high-quality foreign talent to support innovation is very limited
- Kuwaitization and other policies hinder innovative firms; there is a lot of local foreign talent that could be captured.
- Large state firms dominate the Kuwaiti economy but do not strongly "pull" innovation. Large firms do not act as sources of spin offs.

The current 5 years of the national plan (2020-2025) focus on private sector engagement and initiatives supporting development of a knowledge economy (2025-2030) with explicit support for innovation and science which account for 7-8% of projects that have a science and innovation component whilst less than 0.2% of the total budget is targeted at the Knowledge economy (OECD, 2019).

14.0 Conclusions, Recommendations for SETI Policy in Kuwait.

14.0 Conclusions, Recommendations for SETI Policy in Kuwait.

The major gap in SETI in Kuwait is the lack of SETI policy. Recommendations and a list of priorities with proposed targets are shown as follows:

- The Government of Kuwait to design a fully-fledged SETI policy for the next ten years with the active involvement of the NIS stakeholders (Kuwait SETIP) and provide all necessary means to support its implementation by establishing a multi-stakeholder dialogue, dialogue with enhanced communication and information technology infrastructure capacity, design of a coherent SETI policy mix, and integration of SETI in other policy areas.
- Redistributing the roles and responsibilities among the NIS stakeholders involved in implementing policies, strategies, and measures for innovative development, considering principles such as segregation of duties, transparency, and effective coordination.
- Establishing and maintaining a balanced policy mix and evaluating and improving the existing SETI instruments and SETI infrastructures to achieve greater and sustainable impact and eliminate duplications.
- Strengthening the research institutes (RIs), particularly KISR, by implementing a comprehensive reform programme.
- Assigning the Central Statistical Bureau to monitor and publish the SETI indicators required in the national report on the Implementation of the Recommendation on Science and Scientific Researchers.
 - Reviewing and revising the legislation system of Science, Technology and Innovation.
 - Significantly enhanced funding of R&D and other STI activities, and the targeting of that funding to areas of greatest strategic significance to the country and supporting the Kuwait National Development Strategy.
 - Developing and implementing measures to continuously invest in skills and capacity building for teams responsible for policy, project, and programme design and implementation at the ministries and other agencies (including the management units of innovation infrastructures).
 - Female empowerment to achieve gender balance in SETI need to be pursued with a set of targets and empowerment schemes.
 - Establishing clear definitions for the concepts that concern SETI policies and creating a common understanding about them among all actors of the system.
- The identification and implementation of methods and strategies for increasing industry participation in SETI activities and the benefits of SETI investments.
- The identification and implementation of methods and strategies for enhancing cooperation and coordination of SETI activities at national, regional, and international levels.
- Popularizing STI through scientific institutions/Academic Sciences and media by using advanced and virtual technology tools to reach a wider audience in addition to networking through establishing science clubs and science cities, Non-Governmental Organizations (NGOs).

Some aspirations are proposed as follows:

- Increase in R&D expenditure as percentage of GDP up to 1% by 2030 (GERD/GDP percent is 0.06% in 2018).
- Increase in number of researchers by 30% or more per million inhabitants by 2025.
- Increase in number of annual patents by 30% and improving GII ranking/scoring by 2025.
- Increase in number of technical journal publications by 30% by 2025.

To begin implementation of these recommendations, it is also recommended that the government appoint an implementation team from key SETI stakeholders to begin the preparatory work to launch the (Kuwait SETIP).

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- تحديد وتنفيذ الأساليب والاستراتيجيات لتعزيز التعاون والتنسيق بين أنشطة معهد التجارة الدولية على المستويات الوطنية والإقليمية والدولية.
 - تعميم العلوم والتكنولوجيا والابتكار من خلال المؤسسات العلمية/العلوم الأكاديمية ووسائل الإعلام باستخدام أدوات التكنولوجيا المتقدمة والافتراضية للوصول إلى جمهور أوسع، بالإضافة إلى إقامة شبكات من خلال إنشاء نوادي العلوم والمدن العلمية والمنظمات غير الحكومية.
 - ويقترح تحقيق بعض الأهداف الطموحة على النحو التالي:
 - زيادة الإنفاق على البحث والتطوير كنسبة مئوية من الناتج المحلي الإجمالي تصل إلى 1% بحلول عام 2030 (نسبة GERD/GDP هي 0.06% في عام 2018).
 - زيادة عدد الباحثين بنسبة 30% أو أكثر لكل مليون نسمة بحلول عام 2025.
 - زيادة عدد براءات الاختراع السنوية بنسبة 30% وتحسين ترتيب/تسجيل مؤشر الابتكار العالمي بحلول عام 2025.
 - زيادة عدد منشورات المجالات التقنية بنسبة 30% بحلول عام 2025.
- للبدء في تنفيذ هذه التوصيات، يوصى أيضا بأن تعين الحكومة فريقا تنفيذيا من أصحاب المصلحة الرئيسيين في العلوم والتكنولوجيا والابتكار لبدء الأعمال التحضيرية لإطلاق (خارطة الطريق للعلوم والتكنولوجيا والابتكار في الكويت).

المشاركون

معهد الكويت للأبحاث العلمية

جامعة الكويت

وزارة الصحة

وزارة التعليم العالي

شركة نفط الكويت

الهيئة العامة للتعليم التطبيقي والتدريب

الأمانة العامة للمجلس الأعلى للتخطيط والتنمية

حقوق الطبع

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وبما أنه لا يوجد في الكويت هيكل حكومي خاص لتنسيق سياسات العلوم والتكنولوجيا والابتكار المختلفة بين أصحاب المصلحة مثل: معهد الكويت للأبحاث العلمية وجامعة الكويت والهيئة العامة للتعليم التطبيقي والتدريب، مؤسسة البترول الكويتية، ووزارة الصحة والهيئة العامة للصناعة. فعليه هناك حاجة إلى وضع إطار محلي شامل للبحث والتطوير يضم أصحاب المصلحة في نظم العلوم والتكنولوجيا والابتكار على أن يكون تحت مظلة مجلس الوزراء/ وزارة التعليم العالي. كما يجب وضع برنامج رسمي/ لسياسة العلوم والتكنولوجيا والابتكار للدولة لضمان التنسيق بين الجهات العلمية بهدف تعزيز التآزر وتجنب ازدواجية الجهود.

إن الثغرة الرئيسية في العلوم والتكنولوجيا والابتكار في دولة الكويت هي عدم وجود سياسة متعلقة بها. وعليه تضمن التقرير توصيات وقائمة بالأولويات على النحو التالي:

- على حكومة الكويت تطوير سياسة كاملة للعلوم والتكنولوجيا والابتكار للسنوات العشر القادمة بمشاركة نشطة من أصحاب المصلحة في العلوم والهندسة والتكنولوجيا والابتكار في الدولة وتوفير كافة الوسائل اللازمة لدعم تنفيذها من خلال إقامة حوار متعدد لأصحاب المصلحة، مع تعزيز قدرات البنية التحتية للاتصالات وتكنولوجيا المعلومات، وتصميم مزيج متماسك من سياسات العلوم والتكنولوجيا والابتكار، إدراج العلوم والتكنولوجيا والابتكار ضمن مجالات السياسة العامة الأخرى.
- إعادة توزيع الأدوار والمسؤوليات بين أصحاب المصلحة في جهاز العلوم والمؤسسات الوطنية المشاركين في تنفيذ السياسات والاستراتيجيات والتدابير اللازمة للتنمية الابتكارية، مع مراعاة المبادئ مثل الفصل بين المسؤوليات والمهام والشفافية والتنسيق الفعال.
- تعزيز دور المؤسسات البحثية، ولا سيما معهد الكويت للأبحاث العلمية، من خلال تنفيذ برنامج تطويري شامل.

استمرار مواصلة حكومة دولة الكويت جهودها لدعم العلوم والتكنولوجيا والابتكار على مستوى عال بعناصر رئيسية تشمل:

- مراجعة وإعادة النظر في نظام التشريع للعلوم والتكنولوجيا والابتكار.
- تعزيز تمويل البحث والتطوير والأنشطة الأخرى المتعلقة بالعلوم والهندسة والتكنولوجيا والابتكار بشكل كبير، وتوجيه هذا التمويل إلى مجالات ذات أهمية استراتيجية كبرى بالنسبة للدولة ودعم استراتيجية التنمية الوطنية الكويتية.
- وضع وتنفيذ تدابير للاستثمار المستمر في المهارات وبناء القدرات للفرق المسؤولة عن تصميم وتنفيذ السياسات والمشاريع والبرامج في الوزارات والوكالات الأخرى (بما في ذلك وحدات إدارة البنى التحتية للابتكار).
- ينبغي السعي إلى تمكين المرأة لتحقيق التوازن بين الجنسين في إطار مجموعة من الأهداف وخطط التمكين.
- وضع تعاريف واضحة للمفاهيم التي تتعلق بسياسات العلوم والتكنولوجيا والابتكار وخلق فهم مشترك بشأنها بين جميع الجهات الفاعلة في النظام
- تحديد وتنفيذ الأساليب والاستراتيجيات لزيادة مشاركة الصناعة في مخرجات أنشطة العلوم والتكنولوجيا والابتكار وفوائد استثمار العلوم والتكنولوجيا والابتكار.

ويأتي معظم تمويل البحث والتطوير من وزارة المالية ومؤسسات التمويل مثل مؤسسة الكويت للتقدم العلمي. وعلى مدى أكثر من عقد من الزمان، لم يتجاوز نسبة 0.4% من الناتج المحلي الإجمالي ما عدا عام 2014. وهناك حاجة إلى زيادة التمويل العام إلى ما لا يقل عن 0.6% من الناتج المحلي الإجمالي، وتحسين التفوق العلمي، وتعزيز الصلة بين مؤسسات البحث والتطوير والصناعة، بالإضافة إلى تحسين النظام التعليمي والتصنيف الدولي. ولدعم وضع العلوم والتكنولوجيا والابتكار في الكويت فإنه من الضرورة ان يتم تطوير رأس المال البشري لأغراض البحث العلمي والبحوث التجارية، وتوفير الأموال اللازمة للأنشطة العلمية والتقنية، والبنية التحتية المناسبة مثل: انشاء الحدائق/المجمعات التكنولوجية (على سبيل المثال مجمع الشقايا للطاقة المتجددة التابع لمعهد الكويت للأبحاث العلمية)، والمختبرات، والمعدات.

ان برامج التدريب الداخلي والشراكات الدولية تساهم في تطوير التعاون مع المؤسسات الأكاديمية والبحثية الاقليمية والدولية. وجاري العمل على تعزيز هذه العلاقات الاقليمية والدولية مع مؤسسات البحث والتطوير في الكويت، مثل معهد الكويت للبحوث العلمية، وجامعة الكويت، ومؤسسة الكويت للتقدم العلمي والهيئة العامة للتعليم التطبيقي والتدريب، وغيرها. ولقد طورت هذه المؤسسات الأبحاث العلمية من خلال تعاونها الإقليمي والدولي وتشجيع المشاريع البحثية المشتركة وتبادل العلماء والتدريب، وإجراء، ورش العمل، والمؤتمرات. وقد تم توقيع العديد من الاتفاقيات العلمية بين معهد الكويت للأبحاث العلمية ومع جامعات ومؤسسات بحثية وأكاديمية دولية. فعلى سبيل المثال تم تنفيذ بعض البرامج التدريبية الناجحة في الخارج بالتعاون مع المجلس الثقافي البريطاني في عام 2020 لتدريب عدد (19) عالما في المملكة المتحدة. وفي مطلع 2020 شاركت الكويت في خطة الاتحاد الأوروبي لتمويل البحوث بالتعاون مع بعض المؤسسات البحثية الأوروبية.

وتعتبر محاولات تسويق نتائج البحوث في الدولة بطيئة بسبب غياب وجود إطار قانوني يساند التسويق التجاري بالإضافة إلى محدودية القدرات والمعرفة والخبرة في تقييم الملكية الفكرية وإدارة عملية التفاوض مع القطاع الخاص أو المشتريين المحتملين للتكنولوجيا. وتحتل الكويت مرتبة متدنية (83 من أصل 190 دولة) في بيانات البنك الدولي "ترتيب ممارسة أنشطة الأعمال في عام 2020" حيث سجلت 67.4 نقطة، في حين احتلت الإمارات العربية المتحدة المرتبة 16 برصيد 80.9. وتحتاج الكويت إلى بذل المزيد من الجهد لتحسين الإطار التنظيمي لممارسة الأعمال التجارية، لا سيما فيما يتعلق بالبيروقراطية الحكومية، كونها عقبة رئيسية أمام تعزيز الابتكار والقدرة التنافسية.

وأظهرت الأرقام القياسية الأخيرة على مؤشرات الكويت (2017-2018) ضعف درجات التقييم مقارنة بدول مجلس التعاون الخليجي الأخرى. وأظهرت نتائج البلدان لمؤشر العلوم والتكنولوجيا ذات الصلة القيم التالية: 45 في مؤشر الاتصال العالمي (GCI)، و5.98 في مؤشر تنمية تكنولوجيا المعلومات والاتصالات (IDI)، و42.8 في مؤشر ريادة الأعمال العالمي (GEDI)، و34.4 في مؤشر الابتكار العالمي (GII)، و5.38 في المؤشر الدولي لحقوق الملكية (IPRI). وتحتاج الكويت إلى إنشاء نظام للرصد والتقييم لمتابعة التقدم المحرز وتعزيز مركزها في المؤشرات في مجال العلوم والتكنولوجيا والابتكار.



وفي مايو 2021 قام معالي وزير النفط والتعليم العالي بتشكيل لجنة وطنية لإعداد تقرير دولة الكويت بناء على المعايير والأحكام الموصي بها في قرار اليونسكو، وشكلت اللجنة من الجهات التالية:

- معهد الكويت للأبحاث العلمية (رئيس اللجنة)
- جامعة الكويت
- الهيئة العامة للتعليم التطبيقي والتدريب
- مؤسسة الكويت للتقدم العلمي
- الأمانة العامة للمجلس الأعلى للتخطيط والتنمية
- وزارة التعليم العالي
- وزارة الصحة
- شركة نفط الكويت

وتم تكليف معهد الكويت للأبحاث العلمية برئاسة اللجنة كنقطة الارتباط الوطنية لإعداد التقرير بالتنسيق مع اليونسكو. وقامت اللجنة بإعداد التقرير وتقديم التوصيات التي تم ايجازها في هذا التقرير: تعتبر دولة الكويت من الدول ذات الدخل المرتفع اذ يبلغ إجمالي الناتج المحلي فيها (GDP) 134.6 مليار دولار أمريكي (2019). ويبلغ نصيب الفرد من الناتج المحلي الإجمالي (GDP Per Capita) 32,000.45 دولار أمريكي (2019). والكويت هي ثالث أعلى دولة في مستوى الشراكة بين القطاعين العام والخاص في دول الخليج بعد قطر والإمارات بقوة شرائية تعادل (\$PPP) 58,590 دولار.

إن التحول الاقتصادي في البلاد والنمو الاقتصادي على مدى السنوات الخمس الماضية يظهر إجمالي الدخل القومي للفرد PPP 58,590 دولار (\$GNI) Per Capita (PPP) (2018). ويبلغ معدل نمو الناتج المحلي الإجمالي 0.4% في عام 2019، وتشير نتائج مؤشر التنمية البشرية في الكويت إلى انخفاض المؤشر على مدى خمس سنوات من 2014-2019، مسجلاً 0.806 في عام 2019. وعلى الرغم من انخفاض معدل البطالة في الكويت إلى 2.30 في المئة في عام 2020 ومن 2.41 في المئة في عام 2019 فإن معدل البطالة، ولا سيما بطالة الشباب، لا يزال مصدر قلق للحكومة. ومن التحديات التي أثرت على البطالة هي الفجوات في المهارات في سوق العمل ومحدودية فرص التدريب على المهارات التقنية.

Arabic Executive Summary

خارطة البحث والابتكار في دولة الكويت موجز التقرير الأول عن تنفيذ توصية اليونسكو المتعلقة بالعلم والباحثين العلميين مقدم الى منظمة الأمم المتحدة للتربية والعلم والثقافة (اليونسكو) معهد الكويت للأبحاث العلمية 30 June 2021

في مؤتمر منظمة الأمم المتحدة للتربية والعلم والثقافة (اليونسكو) التاسع والثلاثون والذي انعقد في باريس في الفترة من 30 أكتوبر إلى 13 نوفمبر 2017، تم اعتراف الدول الأعضاء بما للعلوم والتكنولوجيا من قيمة متزايدة في معالجة مختلف المشكلات العالمية على أساس عالمي واسع، الامر الذي يدعم التعاون بين الأمم ويعزز تنمية كل منها، وان هذه التوجه يشجع الدول الأعضاء على اتخاذ التدابير العملية من أجل استحداث وتطبيق سياسات علمية وتكنولوجية ملائمة. كما اتفق الأعضاء بأن مثل هذه التدابير الحكومية تساعد إلى حد بعيد على تهيئة الظروف التي تشجع القدرات المحلية وتعينها على ممارسة أنشطة البحث والتطوير واستخدام نتائجها لتعزيز الشعور القومي بروح المسؤولية تجاه الانسان وبيئته. ومن أهم هذه الظروف ضمان أوضاع عادلة للمشتغلين بالفعل في البحث والتطوير في مجال العلوم والتكنولوجيا، مع مراعاة المسؤوليات التي تنطوي تحتها هذه الاعمال والحقوق اللازمة لأدائها. ونظرا إلى أن أنشطة البحث والتطوير تنفذ في ظروف استثنائية وتتطلب مسؤوليات من جانب العاملين في مجال البحث العلمي تجاه هذا العمل وتجاه وطنهم والمتطلبات الدولية التي تسعى الأمم المتحدة الى تحقيقها، ولأن ذلك يتطلب أوضاع ملائمة للعاملين بهذه المهنة، فقد وضع المؤتمر أحكاما خاصة بالقضايا ذات الأهمية الأساسية للعاملين في مجال البحوث العلمية لاستكمال المعايير والتوصيات الواردة في قرار اليونسكو وقد اعتمد المؤتمر التوصية الخاصة بالعلوم والعاملين بالبحث العلمي، في تاريخ 13 نوفمبر 2017.

وقد قامت الأمانة العامة للجنة الوطنية الكويتية للتربية والعلوم والثقافة بمراسلة وزارة التعليم العالي والمؤسسات ذات العلاقة في دولة الكويت وافادتهم بتوصية اليونسكو في المؤتمر العام لليونسكو في الدورة التاسعة والثلاثون المنعقد في باريس عام 2017، وعملاً بالقرار 37م/40 والقرار 45/38. وسعي اليونسكو لتعزيز العلاقات العلمية بين شعوب العالم، وإلى بلوغ أهداف السلام الدولي وتحقيق الصالح المشترك للجنس البشري وإشراك المجتمع في حياة المجتمع الثقافية في التقدم العلمي والاستفادة من نتائج البحث العلمي. كما أوصى المؤتمر الدول الأعضاء باتخاذ الخطوات التشريعية وغير التشريعية اللازمة لتطبيق المبادئ والمعايير الواردة في التوصية لكل من هذه الدول، وأن تعرض هذه التوصية على السلطات والمؤسسات والمنشآت المسؤولة عن إجراءات البحث العلمي وتطبيق النتائج على مختلف المنظمات التي تمثل العاملين بالبحث العلمي أو تعني برعاية مصالحهم، وأن تقدم الدول الأعضاء إلى اليونسكو تقارير كل أربعة أعوام لتبين ما تتخذه الدول الأعضاء من تدابير لتنفيذ هذه التوصية على أن يقدم التقرير الأول في 30 يونيو 2021.



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